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ENTERPRISE RISK (MIS)MANAGEMENT – PERFORMANCE IMPLICATIONS OF THE MISAPPLICATION OF RISK CAPACITY

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Abstract: *The study assesses the relationship between enterprise risk management (ERM) and risk tolerance to determine if there is evidence of operational efficiencies as a result of implied well structured, optimal risk tolerances. Current ERM research suggests that firms which adopt ERM obtain a holistic perspective of their risk profile, and make better decisions with resource allocation and risk strategy in contrast to companies that have not fully adopted ERM. However, these studies generally lack a discussion of how risk tolerances and ERM are related, and that this relationship can determine the effectiveness of ERM. Using a sample of 110 US publicly listed insurance companies, a two stage step-wise regression process is used to provide evidence to support this idea. We show that one reason for ERM user successes is that their ERM frameworks facilitate an alignment of risk tolerances to risk capacity, a subtle, yet essential aspect of the ERM process. When this alignment is established we see stronger operational efficiencies across ERM-user firms with well structured risk tolerances relative to those firms where such structures are in question.*

Introduction

Public corporations through the course of normal business operations are expected to generate earnings for their shareholders. Doing so is not without risk. Unforeseen events can disrupt income, or unexpected economic or environmental factors can limit financial forecasts from coming to fruition. Managers of these firms that are able to make strategic and operational decisions which generate consistent earnings while controlling for risk can add value. Several studies show that risk management can improve performance such as reducing the costs of financial distress and certain tax liabilities (Smith and Shultz, 1985; Graham and Rogers, 2002), reduced regulatory constraints (Mayers and Smith, 1982), enhanced diversification (Mayers and Smith, 1990), enhanced financial flexibility and reduce the costs of capital (Froot, Scharfstein et al., 1993) among others. More recent studies have shown that a holistic understanding and approach to managing risk can lead to operational efficiencies and higher valuations - e.g., Gordon et al (2009), Hoyt and Liebenberg (2011). This holistic approach, called Enterprise Risk Management (ERM), builds on the merits of traditional risk management practices and facilitates a cohesive, strategic management of risks that permeate across an organization (Nocco and Stulz, 2006). Hence, ERM is meant to not only assess and control risks, but also to understand how they interact with each other. When done effectively ERM supports strategy and operational efficiency. However, ERM is not a "one size fits all" concept. Factors such as graphical foot print, leverage, operational strategy and organizational complexity will vary by company, and effective ERM frameworks are tailored to these differences (Gordon et al, 2009).

Perhaps one of the most basic, yet most critical, elements of any ERM construct is for a firm to have established risk preferences - namely risk appetite and risk tolerance - upon which

ERM can function towards. One definition proposed for risk appetite is by Aven (2013), p. 476: “the willingness to take on risky activities in pursuit of values”. For the sake of this study we define risk appetite and risk tolerance separately in turn. Risk appetite covers those risks that an organization wishes to attract and get paid to assume in support of operational and strategic objectives. Risk tolerance measures the extent of which those risks an organization has an appetite will remain on the balance sheet. For all intents and purposes risk appetite is a high level qualitative expression, where risk tolerance is a quantitative metric that measures risk appetite. Both appetite and tolerance combine to form an organization's risk preferences. Undeveloped or misapplied risk preferences undermine the prudent risk-based decisions and objectives of an otherwise solid ERM framework (Hillson and Murray-Webster, 2012).

While, the existing literature has shown that well structured ERM does influence value, few empirical studies exist that have explored how this influence changes when risk appetite or risk tolerance is not aligned to a firm's ERM process. One exception is a study by Myers (2014), who used hierarchical moderation regression techniques to discuss how ERM processes within banks and insurance companies that are not anchored with an established risk appetite can be ineffective. Their findings showed how the strength of an ERM framework, coupled with risk tolerance estimates, impacted value. However, that study assumed that different organizational risk profiles (e.g., complexity, risk management leadership) were not factors, and assumed that all companies practiced ERM to some degree. This study will build on that approach, but present an alternative methodology by introducing the impact of factors unique to an organization such as graphical foot print, leverage, organizational complexity, and ERM integration and how these factors jointly influence risk tolerance.

The goal of this study is to examine the extent of which an integrated ERM framework influences an insurer's risk preferences, and to see if optimal risk preferences influence performance. We will do so by combining elements of the research designs of two recent ERM studies. We will measure ERM strength following a methodology developed by Gordon et al (2009), and we will evaluate ERM integration based on a methodology presented by Hoyt and Liebenberg (2011). Our argument is that when ERM is both strong and integrated into the firm, insurers are able to operate towards an optimal or well-structured risk tolerance. Furthermore, as that optimal risk tolerance is determined, improved operational efficiencies are realized.

This research should contribute to the existing literature in multiple ways. It links multiple empirical and theoretical works to cohesively demonstrate how and why ERM influences performance. Unlike most existing literature, this research does not presume that ERM is directly linked to performance. Indeed, it shows that ERM's effectiveness is predicated on its integration as well as its adaptation towards a well structured risk tolerance.

The remainder of this paper is organized in five additional sections. Section two explores additional relevant literature and background related to the underlying argument of the study. Section three presents the research design. Section four includes a discussion of the data used in the study. Section five provides an overview of the empirical results. Section six presents concluding comments.

Review of the Literature

Traditional risk management has been identified historically as a means to support operational efficiencies - e.g. Smith and Stulz (1985), Mayers and Smith (1982, 1990), (Froot, Scharfstein et al. 1993). Enterprise risk management is a framework that takes traditional risk management to a point where the management of risk goes beyond a control mechanism to that where performance and valuation is enhanced via holistic risk management processes (Nocco and Stulz, 2006). Meulbroek (2002) describes the fundamentals of ERM reflecting a holistic and

aggregated process to management risk across an enterprise. COSO (2012, 2004) goes as far as defining four components that define ERM - efficiencies with strategy, operations, reporting and compliance; and that practitioners of strong and integrated ERM should exhibit better performance and generate higher value relative to non-practitioners. These notions have been explored empirically by Gordon et al (2009), Hoyt and Liebenberg (2011), McShane et al (2011), Standard & Poor's (2013b) and others. Additionally, it has been shown that operational costs can be reduced and efficiencies increased through effective ERM (Eckles et al, 2014). Moreover, ERM has been cited as a means for organizations to better adapt to changing regulatory standards (Arnold et al 2011).

Determining if a company has an ERM framework in place, and in turn measuring the effectiveness of ERM is not without challenges. Such disclosures are voluntarily and inconsistently communicated across companies, making relative comparisons and data collection difficult. Some studies have used announcements of chief risk officer appointments as an indicator of ERM - e.g., Liebenberg and Hoyt (2003). Indeed, more complex organizations may have a need for stronger ERM frameworks. This may be signalled through the hiring of chief risk officers or similar roles to oversee the integration of these frameworks (Pagach and Warr 2011). Gordon et al (2009) developed an ERM index score based on COSO's (2012, 2004) definition of ERM. Additionally, certain credit rating agencies publish opinions on the strength of ERM, but only for the companies they rate (Standard & Poor's, 2013a).

ERM also facilitates a better understanding of, and decisions surrounding, ideal risk preferences and ideal risk profiles, e.g., Nocco and Stulz (2006). Hillson and Murray-Webster (2012) explore how risk-based decision making is linked to risk preferences. Risk profiles are a reflection of risk capacity. One way to frame risk capacity is via a financial context; for instance, using the size and scope of a company's balance sheet. Regulators and rating agencies incorporate risk-based capital models which gauge the risk profile of an insurer relative to its financial position - e.g. EIOPA (2010), AM Best (2013). This might consider all assets, liabilities and equity of the firm. However, there may be other aspects of risk capacity that are not measured with these approaches. For example, Power (2009) argued that using financial capital as measurement of risk capacity and risk appetite may be too narrow of a measurement and overlook broader ethical and behavioral elements that hold no quantitative measure yet are important considerations in risk management.

Research Design

There are two hypothesis at the center of the argument in this paper. One is that insurers with strong integrated ERM suited to their complexity and degree of leverage, are able to achieve better performance relative to those with weaker or non-existent ERM frameworks. The other is that the aforementioned achievement is predicated on insurers operating within an optimal risk tolerance, ideally suitable to their optimal risk profile. Hence:

$$\text{Optimal Risk Tolerance} = f(\text{Complexity, Leverage, ERM}) \quad (\text{Hypothesis I})$$

$$\text{Performance} = f(\text{Optimal Risk Tolerance}) \quad (\text{Hypothesis II})$$

Both aspects are tested through linear regression. This argument shows that ERM's influence on performance and value is not necessarily due to a direct link such as what McShane et al (2011) argued against, but follows other studies that have shown that ERM's influence is predicated on other interactions, such as the suitability of ERM not simply the apparent strength of ERM (e.g., Gordon et al, 2009).

Our view of risk tolerance is linked to an insurer's financial position as measured by the size of its balance sheet. Firms with high risk tolerances will expose more of its balance sheet to potential earnings losses than other firms. As an organization becomes more complex, more things can go wrong or need to be unaccounted for, thus inherent risks become more apparent. Similarly, high leverage acts a multiplier of good or bad outcomes, thus it increases an insurer's inherent risk profile. Since complexity and leverage reduce the margin of error as managers execute risk strategies, intuition suggests that these factors should act inversely to an operational risk tolerance. Specifically, as organizations become more complex or increase leverage they should seek lower risk tolerances.

Enterprise risk management may offset or reduce the likelihood of adverse earnings outcomes associated with complexity or leverage. But this assumes that the ERM framework is well designed and fully integrated into the organization. All else equal we expect that increases to ERM strength can support increases to risk tolerance.

By striking the right balance across complexity, leverage and ERM an optimal risk tolerance can be identified for the insurer. Existing ERM research state that companies which are ERM users benefit from lower costs, higher risk adjusted performance and increased valuations (e.g., Nocco and Stultz, 2006; Gordon et al, 2009; Hoyt and Liebenberg, 2011). However, the role of risk tolerance in how these benefits come to fruition warrants further exploration. We suggest that insurers who strike the ideal balance among complexity, leverage and ERM, and in turn operate within an optimal risk tolerance range, generate relatively higher performance. Hence we confirm that the link between ERM and performance is not necessarily a linear one.

We will assess this by first regressing risk tolerance on complexity, leverage and ERM and other control variables to evaluate for a possible relationship.

$$\text{Risk Tolerance}_i = \beta_0 + \beta_1 \text{Complexity}_i + \beta_2 \text{Leverage}_i + \beta_3 \text{ERM}_i + \beta_x \text{Control Variables}_i + \varepsilon_i \quad (1)$$

If there is predictive power found in model (1), then the regression equation will suggest an optimal risk tolerance level for each insurer in our sample. Riskier profiles garner lower risk tolerances so it is important to recognize the signs of the coefficients in model (1). We expect complexity and leverage to put downward pressure on the ideal risk tolerance since these elevate an insurer's risk profile, and we expect strong and integrated ERM to allow a higher risk tolerance since this reduces the risk profile. The signs for the control variable coefficients will vary.

Next we will assess how each company's residual in model (1), ε_i , relate to that company's performance. Performance will be measured by return on assets and return on equity both on a risk adjusted basis. The expectation is that as the absolute value of the residual increases, a company's existing risk tolerance range is further removed from its optimal risk tolerance range and performance suffers as a result. We take the absolute value, because existing risk tolerances can be too high or too low relative to optimal levels. We also separate negative residuals from positive residuals to isolate any potential differences in influence by either an overly conservative (negative ε_i) or overly aggressive (positive ε_i) risk tolerance relative to optimal levels. This residual is inversely related to performance, so as the deviation increases performance should decrease. See model (2).

$$\text{Performance}_i = \beta_0 + \beta_1 |-\varepsilon_i| + \beta_2 |+\varepsilon_i| + e_i \quad (2)$$

Where Performance is risk adjusted ROA or risk adjusted ROE

Where $|-\varepsilon_i|$ is the absolute value of company i's residual if below an optimal risk tolerance

Where $|+\varepsilon_i|$ is the absolute value of company i's residual if above an optimal risk tolerance

Each company has only one of either a residual below, above or equal to its optimal risk tolerance

Holding all else constant if the regression coefficients of model (2) are statistically greater than zero, then model (2) supports our argument that an optimal risk tolerance contributes to performance. The next section will review the data used in this study and how the variables for models (1) and (2) are estimated.

Discussion and Evaluation of Data

Data Sources

The initial data set was sourced from SNL Financial and included its listing of 145 publicly traded stock insurance companies based in the United States. The focus was narrowed to insurance organizations since risk management is normally their strategic focus. U.S. Insurers were used to avoid the potential for regional differences and influences, and also because more data is readily available for U.S. entities compared to most other regions. The choice to use publically traded companies allowed greater opportunities to extrapolate the necessary qualitative and quantitative data than what would typically be available from private firms, while also considering the impact to stock price performance.

The core data for the analysis included financial performance, operational statistics and stock price returns. SNL Financial, CompuStat and CRSP were the primary sources for this information. The 2013 reporting year was the primary year of focus for each company. However, for certain metrics in our research design we required multiple years of data going back to 2008 (e.g., return on equity volatility). Some of the initial 145 companies in the study were missing data for certain years or reported data would not produce meaningful results (e.g., a negative shareholders equity balance). After review of the initial sample it was determined that 110 of the 145 had sufficient financial and operational data to be included within the study. This sample size of 110 is deemed reasonable. It is well above the range suggested by Field (2009) for regression model validity¹.

It was also necessary to identify companies that had integrated ERM frameworks. There are no formalized reporting requirements as respects to ERM for U.S. insurance companies. In order to track this information we followed a similar method employed by Hoyt and Liebenberg (2011), Eckles et al (2014) and others that track signals in the commentary of public disclosures of a company to determine the presence of integrated ERM. Firstly, reviewed each company's 2013 annual report, 10K, and website² for language indicative of ERM. Example catch phrases included "Enterprise Risk Management", "Holistic Risk Management", "Corporate Risk Management" and similar. We then assessed the context of the phrase to assess if the company was currently practicing ERM, and not simply defining it or were noting future plans for implementation. Additionally, as shown by Liebenberg and Hoyt (2003), Beasley et al (2005) and Pagach and Warr (2011), companies with Chief Risk Officers, Heads of ERM or equivalent positions tend to have integrated ERM frameworks. Thus if ERM framework descriptions were not readily evident in a company's public disclosures, those companies with CRO-equivalent

¹ Field notes that the recommended minimum sample size to test such validity is dependent on the number of predictors in the model. Specifically the target sample size = $50 + 8k$, where k is below my sample of 110.

² Website data was reviewed as of month-end February 2015 across all 110 companies in the study for consistency of timing.

positions listed on websites or within financial statements were deemed to have integrated ERM frameworks for this study. Thirdly, in those instances where no CRO was present and there was no indication of ERM otherwise, we reviewed available rating agency reports to find suggestions of integrated ERM³. Finally, if a company only described a risk management practice that was focused on one specific risk type (e.g., managing interest risk through derivatives hedges; utilizing reinsurance for natural catastrophe risk) these alone were not considered characteristics of an integrated ERM framework. See Appendix A for examples of commentary used to confirm integrated ERM.

Variable Calculation and Measurement

Ten research variables were tracked for this study using data captured as described above. Eight of these were continuous, non-categorical variables. Two were discrete, categorical variables. Table 1 provides a quick reference for how these variables are defined. Table 2 provides some corresponding descriptive statistics and correlation data. These will be discussed in turn and its relevance to this study.

Table 1. Description of variables used in the study

Variable	Abbreviation	Definition	Data Source
Enterprise Risk Management Index	ERMI	Score that measures the strength of a firm's ERM considering COSO's four pillars: strategy, operations, reporting and compliance	COMPUSTAT, CRSP, SNL
Integrated ERM	INTEG	A categorical variable denoting if a company shows evidence that their ERM framework is formalized and integrated into their operational lexicon. 1 = yes; 0 = no	Financial statements, websites, rating agency reports
Leverage	LEV	Average assets for the year divided by average equity for the year.	SNL
Life Insurer	LIFE	Dummy variable to capture if an insurer was a life company or non-life company.	COMPUSTAT, SNL
Market Share	MS	Market share takes each insurer's 2013 revenues divided by total revenues generated that year by that insurer's industry (life, health or property casualty) in the United States.	COMPUSTAT, SNL
Organizational Complexity	COMPLX	A categorical variable denoting the degree of complexity of a firm. Low: < 4 Segments, Medium: 4-6 Segments, Elevated: > 6 Segments, High: > 6 Segments with global operations. Note any firm with global operations is considered to have an additional segment.	COMPUSTAT

³ For instance, the credit rating agency Standard & Poor's produces an annual financial strength rating and corresponding rationale report. Within these reports are commentary regarding the strength of the insurer's ERM framework. Companies deemed to have stronger ERM assessments by S&P were also deemed to have integrated ERM for the purposes of our study.

Variable	Abbreviation	Definition	Data Source
Return on Assets	ROA	Earnings before interest and taxes over average assets for the year.	SNL
Return on Assets (risk adjusted)	ROAz	ROA divided by the five year annual standard deviation of ROA.	SNL
Return on Equity	ROE	Earnings before interest and taxes over average equity for the year.	SNL
Return on Equity (risk adjusted)	ROEz	ROE divided by the five year annual standard deviation of ROE.	SNL
Risk Capacity	RCAP	The size of insurers balance sheet as measured by average assets for the year.	SNL
Risk Capacity Utilization	RCU	A proxy of a firm's risk tolerance. It is Average Equity times ROE VAR divided by Risk Capacity.	SNL
ROE Value at Risk	VAR	Five year standard deviation of ROE multiplied by the 99.5% confidence statistical table factor of 2.56 applied to average equity.	SNL
Years in Business	AGE	The number of years that an insurer has been in business.	COMPUSTAT, SNL, websites

Table 2. Descriptive Statistics and Correlations of key variables used in the study. Correlations above 0.50 are denoted in bold.

Enterprise Risk Management Index (ERMI) Subgroup Comparison

Variables	Total Sample		Integrated ERM		Not Integrated		Difference In Means	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation	Difference	p-Value
ERMI	0.157	2.622	0.701	2.240	-0.497	2.907	1.198	0.016
LEV	6.114	6.008	6.818	7.284	5.268	7.284	1.550	0.179
MS	0.018	0.042	0.019	0.047	0.016	0.034	0.003	0.711
ROA	0.034	0.034	0.035	0.031	0.034	0.038	0.000	0.969
ROAz	3.581	3.965	3.670	2.977	3.474	4.927	0.196	0.797
ROE	0.134	0.133	0.134	0.090	0.135	0.172	-0.001	0.979
ROEz	3.215	3.908	3.329	2.554	3.079	5.107	0.250	0.740
RCU	0.053	0.053	0.050	0.053	0.057	0.053	-0.007	0.498
VAR	0.230	0.253	0.234	0.289	0.224	0.204	0.010	0.840

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AGE	52.982	44.033	51.017	44.900	55.340	43.304	-4.323	0.610
Sample Size	110		60		50			

	ERMI	XS	LEV	ROA	ROE	RCU	VAR	ROAz	ROEz	AGE	MS
ERMI	1										
XS	-0.110	1									
LEV	0.077	-0.232	1								
ROA	-0.048	0.167	-0.378	1							
ROE	-0.118	0.016	-0.026	0.765	1						
RCU	-0.074	-0.027	-0.303	0.129	-0.101	1					
VAR	-0.011	-0.338	0.016	-0.175	-0.219	0.829	1				
ROAz	0.045	0.055	-0.085	0.044	-0.031	-0.049	-0.085	1			
ROEz	0.078	0.066	-0.139	0.097	-0.034	0.001	-0.061	0.741	1		
AGE	-0.063	0.033	-0.088	-0.087	-0.041	-0.074	-0.105	0.126	0.037	1	
MS	0.138	0.046	-0.092	0.127	0.073	0.022	-0.044	0.243	0.370	0.192	1

Enterprise Risk Management Effectiveness Index (ERMI)

This variable captures the strength of an organization's ERM framework following the tradition of COSO (2004, 2012), and measured using a process introduced by Gordon et al (2009). Strategy, operations, reporting and compliance are the four components of the ERMI. Data used to measure these components are extracted from annual financial disclosures, standardized and equally weighted to form the ERMI for each insurer in the study. All else equal a higher score is indicative of a stronger ERM framework for a given company. Details of the data used and the process applied to generate the ERMI calculation are explained in Appendix B.

Integrated ERM (INTEG)

Gordon et al's ERMI score is indicative of how strong an ERM framework appears based on available public information. However, the score on its own makes an assumption that ERM is practiced readily, without any adjustment to account for non-ERM users that coincidentally might have a high indicative ERM score. In order to determine if the insurers in the sample were true practitioners of integrated ERM each organization's available financial and operational disclosures were reviewed, as well as credit rating agency reports if necessary, to make subjective determinations of ERM integration. This was described in further detail in section 4.1 above. To the extent evidence was apparent that an insurer practiced ERM "1" was assigned to that company. All other firms were assigned "0". 60 of the 110 firms, or approximately 55% of the sample were deemed to have integrated ERM.

Leverage (LEV)

It is assumed that as an organization's leverage increases so does the inherent risk of its balance sheet and operational profile all else constant. This was calculated as average total assets divided by average total equity for the 2013 period.

Life Dummy (LIFE)

Life insurers may have certain operational characteristics that are different from their non-life counterparts. These may influence their risk profiles. To capture this influence all life insurers, as denoted as such by COMPUSTAT, were assigned a dummy variable of "1".

Market Share (MS)

Market share takes each insurer's 2013 revenues divided by total revenues generated that year by that insurer's industry (life, health or property casualty) in the United States.

Organizational Complexity (COMPLX)

COMPLX provides an indication of how complex an organization is based on a combination of operating segments and global foot print. The rationale for this follows that as presented by Ge and McVay (2005), Doyle et al (2007), and employed by Eckles (2014), which all argue that as the number of segments for a firm increases so does its complexity. COMPUSTAT data was used to capture the number of operating segments for a firm and if it had global operations. Each insurer was assigned into one of four categories based on this data. Insurers with less than four operating segments were considered low complexity. Those with four to six segments were deemed medium complexity. Those with over six segments were classified as elevated. Those with six or more segments and had global operations were considered of high complexity. Having global operations was considered as having an additional operating segment. For example, a firm with three operating segments would ordinarily fall in the low complexity category, but if that firm also operated globally it was classified as medium complexity instead. These classifications resulted with most insurers in either the medium to elevated categories, with smaller clusters in the low or high category. Table 3 provides the count in each category for the COMPLX variable.

Table 3. This shows the distribution of companies across the four categories of complexity used in this study.

Complexity Category	Operating Segments*	Count	Percent
Low	less than four	12	11%
Medium	four to six	41	37%
Elevated	greater than six	47	43%
High	greater than six plus global	10	9%
Total		110	100%

* Having global operations was equivalent to having one additional operating segment.

Return on Assets (ROA), Return on Equity (ROE) and Risk-adjusted ROA / ROE

A common measure of operational performance is to assess the amount of earnings a company is able to generate from its assets. This was calculated as earnings before interest and taxes generated over the period divided by average assets for the period. And similar to ROA, but focused on returns that are generated for shareholders, ROE is earnings before interest and taxes

divided by average equity. These are risk adjusted by dividing ROA and ROE by their respective five year standard deviations, which is denoted as ROAz and ROEz.

Risk Capacity (RC), Risk Capacity Utilization (RCU) and ROE Value-at-Risk (VaR)

An insurance company is in the business of exposing itself to risk with an expectation of generating value. Following Aven (2013), an organization's willingness to expose its balance sheet to financial loss is what is defined as risk capacity utilization for the purposes of this study. A firm's risk capacity (RC) is measured by its total assets. Risk capacity utilization (RCU) is measured by taking a portion of RC estimated to support downside risk associated with an insurer's normal course of business over a one year period. See Figure 1.

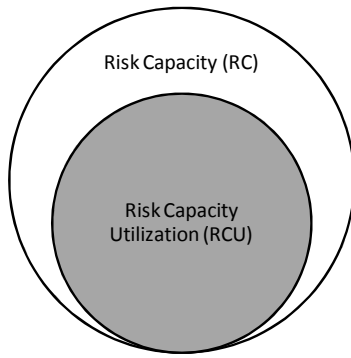


Figure 1. Risk Capacity Utilization Venn Diagram

Equation (ii) formally defines the calculation for RCU.

$$RCU_i = \frac{ROE VaR_i * Equity_i}{Assets_i} \quad (ii)$$

Where for firm i , RCU equals the equity value-at-risk (VaR) expected over a one year period divided by the total assets of the firm. Downside risk metrics such as value-at-risk are considered by financial institutions as a means to articulate risk appetite (Shang and Chen 2012). A parametric VaR is calculated using the expected volatility of returns to a portfolio, the inverse normal cumulative distribution factor (i.e., standard normal critical value) corresponding to the confidence level in question, and the portfolio value (Jorion, 2001, p.109). A 99.5% confidence level is assumed for this paper, which has been used by regulators as the confidence level to which they calibrate their solvency and statutory tests (e.g., EIOPA (F.K.A CEIOPS) (2010)). A 99.5% confidence translates into a 2.56 critical value. Therefore, each case's ROE VaR⁴ is calculated as:

$$Earnings Volatility = ROE Standard Deviation$$

$$ROE \sigma_i = \sqrt{\frac{1}{N-1} \sum_{j=1}^N (ROE_{i,j} - \overline{ROE_i})^2}, \text{ where } i = \text{firm } i, j = \text{year} \quad (iii)$$

$$ROE VaR = ROE \sigma_i \times 2.56 \times Equity \quad (iv)$$

⁴ VAR can be estimated in various ways, including parametrically. A parametric VaR is usually used when the corresponding variable is assumed to follow a normal distribution. For the sake of this analysis we make a strong assumption that the five year return on equity value for each case in each sample is normally distributed.

It was assumed that firms exhibit high RCUs due to implied high risk tolerances. However, high RCUs are not necessarily bad, nor are low RCUs necessarily good. What is argued is if a firm's RCU is too high or too low relative to its risk profile, i.e. less than optimal, then its performance can suffer. A strong and integrated ERM framework helps establish an appropriate RCU level for a given firm.

Years of Operation (AGE)

AGE takes the total years of existence for each insurer as denoted by COMPUSTAT. It is assumed that younger firms would be more risky relative to older established firms.

Data Review and Analysis

The initial review of the data included assessing differences in means of the eleven continuous variables across the integrated and non-integrated ERM subgroup. These are shown in part in Table 2. There were 60 insurers identified with integrated ERM and 50 without integrated ERM. Comparing the two groups shows no obvious linear differences in the means across all variables other ERMI. Correlations were generally low across all variables except between ROA and ROE, between ROAz and ROEz, and between RCU and VAR. ROA and ROE use the same return values. The RCU metric is directly impacted by a company's VAR. ERMI exhibits no obvious linear positive or negative linear relationship with any other variable. The empirical results of this study are presented in the next section, which show how on a non-linear basis ERMI's influence becomes more apparent.

Empirical Results

A multi staged regression was applied to examine the role that enterprise risk management plays with performance. The argument is that ERM's influence on performance is not necessarily direct or linear. A key outgrowth of strong and integrated ERM is that ERM users can identify and work towards an optimal use of their risk bearing capacity, i.e., risk tolerance. As management decisions facilitate movement towards and within optimal risk tolerance levels, they are able to improve performance.

Model Evaluation

The first regression assessed the relationship across complexity (CMPLX), leverage (LEV), enterprise risk management (ERMI) and risk capacity utilization (RCU), where RCU is our proxy for risk tolerance:

$$\text{Risk Tolerance} = \beta_0 + \beta_1 \text{Complexity} + \beta_2 \text{Leverage} + \beta_3 \text{ERM} + \text{Residual} \quad (1)$$

The complexity variable was based on an assigned category of either low, medium, elevated or high. There is no perceived difference in the scale or magnitude between low to medium, medium to elevated or elevated to high. The only assumption is that 'high' suggests higher complexity relative to 'elevated' and so on. Given that these are categories as opposed to continuous variables to define complexity, traditional statistical methods were followed for

regression with categorical variables⁵. Hence dummy variables of 0 or 1 were assigned for each company to identify the category to which that company belonged. Model (1) becomes:

$$Risk\ Tolerance = \beta_0 + \beta_{1DummyA}medComplexity + \beta_{1DummyB}elevComplexity + \beta_{1DummyC}hiComplexity + \beta_2Leverage + \beta_3ERM + Residual \quad (1a)$$

The results of the model (1a) regression are shown in Table 4. The r-squared and F-stat imply that the model has some explanatory value. The COMPLX coefficient shows statistical significance at the 95% confidence level. Additionally, as complexity increases the corresponding coefficient values also increase. Both results support the notion that higher organizational complexity puts greater downward pressure on an optimal risk tolerance. The leverage coefficient is also statistically significant and negative and inline to what we would expect. However, the ERMI variable seems to not have any relevance in determining an optimal risk tolerance in this model.

Table 4. Regression model (1a) results. Risk capacity utilization is regressed on complexity dummy variables, leverage and the ERM proxy.

Model (1a) Regression Result

Optimal RCU reflecting Complexity, Leverage and ERM

Coefficient Name	Coefficient Value	Expected Sign	P-Value	VIF
Intercept	0.102		0.000	
Dummy: medCOMPLX	-0.032	-	0.060	2.871
Dummy: elevCOMPLX	-0.038	-	0.023	2.885
Dummy: hiCOMPLX	-0.055	-	0.014	1.742
LEV	-0.003	-	0.002	1.021
ERMI	0.000	+	0.997	1.050
F-Statistic	3.767		0.004	
R-Squared	0.153			
Adjusted R-Squared	0.113			

Gordon et al's (2009) ERMI score methodology was used, which includes four equally weighted standardized values across strategy, operations, reporting and compliance. These four areas are consistent with COSO (2004, 2012). However, this score on its own only captures the strength of ERM. It does not recognize that some organizations have integrated ERM and others do not. For example, an insurer may practice one or more elements of traditional risk management very well, while not on a holistic or integrated basis. This may look like it practices certain characteristics of strong ERM (e.g., very effective operations), but these elements may not be

⁵ See Field (2009).

interlinked as defined by COSO (2004, 2012). To account for these potential false impressions an adjustment was made to the ERMI score by accounting for those insurers assessed to have integrated ERM (INTEG) versus those that do not as defined in section 4.4 above. An interactive variable was added to model (1a) by multiply ERMI by their INTEG score. This follows methods used by Eckles et al (2014), Hoyt and Liebenberg (2011), which showed how evidence of ERM interaction and implementation impact risk profiles and valuation. Model (1a) is modified to model (1b):

$$\text{Risk Tolerance} = \beta_0 + \text{medComplexity} + \beta_{1b}\text{elevComplexity} + \beta_{1c}\text{hiComplexity} + \beta_2\text{Leverage} + \beta_3\text{ERM} + \beta_4\text{ERMI} * \text{INTEG} + \text{Residual} \quad (1b)$$

Table 5. Regression model (1b) results. Risk capacity utilization is regressed on complexity dummy variables, leverage, the ERM proxy, and a variable that recognizes if ERM is integrated within the firm.

Model (1b) Regression Result

Optimal RCU reflecting Complexity, Leverage, ERM and Integrated ERM Qualifier

Coefficient Name	Coefficient Value	Expected Sign	P-Value	VIF
Intercept	0.096		0.000	
Dummy: medCOMPLX	-0.029	-	0.077	2.884
Dummy: elevCOMPLX	-0.033	-	0.047	2.944
Dummy: hiCOMPLX	-0.051	-	0.020	1.753
LEV	-0.003	-	0.001	1.022
ERMI	-0.004	-/+	0.133	1.881
ERMIXINTEG	0.009	+	0.026	1.831
F-Statistic	4.117		0.001	
R-Squared	0.193			
Adjusted R-Squared	0.146			
R-Square Change	0.193		0.026	

The results of the model (1b) regression are shown in Table 5. The r-squared and F-stat imply that the model has some explanatory value. Moreover, the r-squared improvement to 0.194 from 0.150 by including the ERMIXINTEG variable is statistically significant compared to the results of the model 1a regression. The COMPLX coefficients shows reasonable statistical significance at just below the 95% confidence level or better, and similar to model (1a) there is a progression in the coefficient as its value gets more negative going from medium to high complexity. Leverage is negative and statistically significant as with model (1a). ERMI shows more relevance in this model, but still falls short of even the 90% confidence level. However, when

we consider the interactive variable $ERM \times INTEG$ which captures the strength and integrated nature of ERM, we see it is positive and statistically significant. Considering each variable in turn the results are aligned to our expectations: 1. Complexity and leverage add to the risk profile resulting in downward pressure on the optimal risk tolerance; 2. Integrated and strong enterprise risk dampens the risk profile facilitating upward pressure on the optimal risk tolerance. When an insurer is able to strike the optimal mix of complexity, leverage and ERM, and assuming that ERM is integrated, an optimal risk tolerance, as measured by risk capacity utilization, can be achieved.

As an additional model refinement we introduce other risk profile control variables that might influence risk capacity utilization: market share (MS), years of operation (AGE) and a life (LIFE) insurer dummy variable. Moreover, model tests showed evidence of heteroskedasticity with regards to leverage. To account for this weighted least squares was applied to adjust for higher variation in RCU as leverage increased. Model (1b) then becomes model (1c):

$$\begin{aligned} Risk\ Tolerance = & \beta_0 + medComplexity + \beta_{1b}elevComplexity + \beta_{1c}hiComplexity + \\ & \beta_2Leverage + \beta_3ERM + \beta_4ERMI * INTEG + \beta_6MS + \beta_6AGE + \beta_7LIFE + \\ & Residual \end{aligned}$$

(1c)

The results of regression model (1c) are shown in Table 6.

Table 6. Weighted least squares regression model (1c) results. Risk capacity utilization is regressed on complexity dummy variables, leverage, the ERM proxy, an integrated ERM variable while also considering other control variables - market share, the age of the company and if the company is a life insurer.

Model (1c) Regression Result

Optimal RCU reflecting Complexity, Leverage, ERM, Integrated ERM Qualifier, control variables: market share, years of operation and life industry designation and weighted least squares.

Coefficient Name	Coefficient Value	Expected Sign	P-Value	VIF
Intercept	0.102		0.000	
Dummy: medCOMPLX	-0.029	-	0.060	0.382
Dummy: elevCOMPLX	-0.029	-	0.063	3.738
Dummy: hiCOMPLX	-0.037	-	0.061	2.104
LEV	-0.001	-	0.010	1.764
ERMI	-0.003		0.277	2.324
ERMixINTEG	0.008	+	0.028	2.512
Market Share	-0.001	-	0.699	1.394
Age	0.000	+	0.140	1.223
Dummy: Life	-0.031	-/+	0.001	1.362

F-Statistic	6.336	0.000
R-Squared	0.363	
Adjusted R-Squared	0.306	

While MS and AGE show no meaningful influence to RCU, being a life insurer does. ERMI in isolation continues to not play a role. Hence, as one last model revision the life control variable is included as an additional predictor of RCU and ERMI is removed. The revised RCU regression becomes model (1d):

$$\text{Risk Tolerance} = \beta_0 + \text{medComplexity} + \beta_{1b} \text{elevComplexity} + \beta_{1c} \text{hiComplexity} + \beta_2 \text{Leverage} + \beta_3 \text{ERMI} * \text{INTEG} + \beta_4 \text{LIFE} + \text{Residual} \quad (1d)$$

The results of regression model (1d) are in Table 7.

Table 7. Weighted least squares regression model (1d) results. Risk capacity utilization is regressed on complexity dummy variables, leverage, an integrated ERM variable and a life dummy control variable.

Model (1d) Regression Result With Weighted Leaset Squares (WLS)

Optimal RCU reflecting Complexity, Leverage, ERM, Integrated ERM Qualifier and Life dummy

Coefficient Name	Coefficient Value	Expected Sign	P-Value	VIF
Intercept	0.100		0.000	
Dummy: medCOMPLX	-0.032	-	0.039	3.743
Dummy: elevCOMPLX	-0.036	-	0.019	3.548
Dummy: hiCOMPLX	-0.046	-	0.016	1.912
LEV	-0.001	-	0.009	1.755
ERMIxINTEG	0.006	+	0.022	1.278
Dummy: Life	-0.034	-	0.000	1.328
F-Statistic	8.666		0.000	
R-Squared	0.335			
Adjusted R-Squared	0.297			
R-Square Change Significance Versus Model (1b)			0.000	

The final regression evaluates how an optimal RCU relates to performance as measured by return on assets and return on equity both on a risk adjusted basis - denoted as ROAz and ROEz respectively. To evaluate this the absolute values of the residuals from model (1d) are collected for each company in the sample and categorized as a positive (i.e., higher than optimal risk tolerance), or negative (i.e., lower than optimal risk tolerance). These were labelled as

ABSRESID+ and ABSRESID- respectively. Next ROAz and ROEz are each regressed on ABSRESID+ and ABSRESID-. The regression equation is noted as model (2).

$$Performance = \beta_0 + \beta_1 ABSRESID_+ + \beta_2 ABSRESID_- + error\ term \quad (2)$$

If there is a positive relationship between optimal risk tolerance and performance one would expect model (2)'s result to show an R-squared and beta coefficients to be statistically different from zero. To interpret this result consider Company A, who has an optimal RCU. If this is so than Company A's ABSRESID would be zero, and the net impact on the performance measure is the regression intercept β_0 . In contrast, Company B has an RCU that is above an optimal level, then Company A's ABSRESID+ would be relatively high resulting in negative pressure on performance.

The regression results of Model (2) are shown in **Table 6**. The results support the argument. The R-squared is positive, the intercept and the ABSRESID+ regression coefficient has the expected signs, and the p-values indicate statistical significance when considering aggressive risk appetites. Insurers with RCUs above optimal levels suffer with regards to risk adjusted performance. Yet insurers with conservative risk appetites, hence RCUs below optimal levels, show no meaningful lag in performance. This could suggest that it is better to be conservative than aggressive with regards to risk capacity.

Table 6. Regression Model (2) results. Risk adjusted ROA and risk adjusted ROE are regressed on the absolute value of the negative and positive residuals from model (1d).

Model (2) Regression Result of ROAz and ROEz versus deviations from optimal RCU. Deviations tracked from residuals of Model (1d)					
	ROAz		ROEz		
Coefficient Name	Coefficient Value	P-Value	Coefficient Value	P-Value	Expected Sign
Intercept	3.962	0.000	3.340	0.000	+
ABSRESID-	16.847	0.393	26.691	0.172	-
ABSRESID+	-35.041	0.003	-29.696	0.010	-
F-Statistic	7.580	0.001	7.267	0.001	
R-Squared	0.124		0.120		

Diagnostics and Robustness Checks

Since the analysis employs linear regression most diagnostics focused on verifying the traditional linear regression assumptions. Multicollinearity was not deemed an issue given the low variance inflation factors in any of the models. The regression residuals were not perfectly normal, but not so much to be of concern. Significant outliers were assessed prior to the regression models being run. These were removed from the original dataset. As mentioned in section 5.1 heteroskedasticity was identified with regards to leverage - as leverage increased variation in RCU levels increased. This was confirmed visually and through a White's Test. As such the regressions were re-run using weighted least squares (WLS). The results were

consistent under this approach as with the un-weighted least squares model but with higher r -squareds. There is a risk of our model over fitting our sample data using WLS so we refrain from making strong generalizations to a population at this time.

There are performance or valuation measures beyond what was used for this study that may be worth consideration such as economic value added, Tobin's Q, and price-to-book. However, valuation metrics generally consider the perspective of shareholders. Moreover there are other factors that might influence risk tolerance levels or indeed other measures of risk tolerance. Further research are encouraged to test such considerations. However, notwithstanding these points, and as it relates to the sample in question, the results of this study provides evidence of how strong and integrated ERM frameworks support ideal risk tolerances for a given risk profile, and how this support is ultimately positively related to common performance measures.

Conclusions

The results of this study demonstrate a plausible, indirect relationship between Enterprise Risk Management and risk-adjusted performance. Using Gordon et al's (2009) measure of ERM, while applying similar methods employed by Eckles et al (2014), Hoyt and Liebenberg (2011) to evaluate the role of integrated ERM, an indirect influence of ERM on performance can be identified. An organization's risk-adjusted performance is defined as the unit of return on assets per unit of risk associated with those returns. Strong and integrated ERM can eventually lead to improvements in organizational performance, but ERM's role is more directly linked to an insurers risk profile and risk capacity utilization. Higher leverage, organizational complexity and simply being life insurer can elevate an insurer's risk profile, but strong and integrated ERM reduce that risk profile. Risk capacity utilization is defined as the range of an insurer's balance sheet that is at risk of loss due to its normal course of operations. Insurers that are able to operate within optimal risk capacity utilization ranges, given their risk profile, are able to realize higher performance compared to those who operate outside of optimal ranges. This linkage has not been fully explored in prior ERM studies. The notion of ERM integration is a critical element of these findings. Exhibiting characteristics of prudent ERM involves a framework that is well structured, but also embraced by the organization's leadership and culture. When this integration is evident ERM's role in supporting risk profiles and ultimately risk adjusted performance can be seen. When this integration is not clear, then ERM's role is in doubt. The results shown are limited to a sample of U.S. publically listed insurance companies, focused primarily on their reported financial and operational results as of year-end 2013. While the findings are meaningful, the data and methods employed are not without their limitations. These are preliminary, yet encouraging, results whose insights support and add to earlier theories and studies surrounding the role of ERM in performance. Further exploration of this idea is encouraged.

Appendix A. Examples / Excerpts of Disclosures Used to Confirm Integrated ERM.

Aetna 2013 Annual Report, Page 67

“We continue to devote resources to further develop and integrate our enterprise-wide risk management processes. Failure to identify, prioritize and appropriately manage or mitigate these risks, including risk concentrations across different industries, segments and geographies, can adversely affect our operating results, our ability to retain or grow business, or, in the event of extreme circumstances, our financial condition or business operations.”

Chubb’s S&P Financial Strength Rating Report, 19 December 2013, S&P Global Credit Portal

“We regard Chubb's ERM framework as strong. Positive scores for risk culture, risk controls, emerging risks management, and strategic risk management along with a neutral score for risk models contribute to the overall assessment.”

“Our positive score for Chubb's risk management culture reflects management's emphasis on underwriting risk management, risk identification and a seasoned committee structure that deals with risks proactively.”

Travelers Inc. 2013 Annual Report, Page 36

“ERM at the Company is an integral part of its business operations. All risk owners across all functions, all corporate leaders and the board of directors are engaged in ERM. ERM involves risk-based analytics, as well as reporting and feedback throughout the enterprise in support of the Company’s long-term financial strategies and objectives.”

Appendix B. Calculating the Enterprise Risk Management (ERM) Effectiveness Index

The ERM index was calculated closely following the specifications developed by Gordon et al (2009). They adhered to the premise that effective ERM is comprised of strengths across four elements as prescribed by COSO (2004, 2012) – strategy, operations, reporting, and compliance. They defined two variables for each element. Each variable of each element was separately standardized first and then subsequently added to create the ERM index for each company in the sample. Following the tradition of Gordon et al (2009), equal weighting was applied to each of the five elements. Most of the variables used in the study were calculated as prescribed by Gordon et al (2009) using multiple data sources: SNL Financial, Compustat and CRSP. Any differences in calculations from Gordon et al are denoted in bold below.

Variable Description	Components
<i>Strategy</i>	
Component 1 =	(company sales – average industry sales) / standard deviation of industry sales
Component 2 =	(change in company's beta from prior year – mean change in betas from prior year for the industry) / standard deviation of change in betas from prior year for the industry
<i>Operations</i>	
Component 1 =	company sales / company total assets
Component 2 =	company sales / company number of full time employees
<i>Reporting</i>	
Component 1 =	reinstatement for the year? (yes = -1; no = 0) + qualified auditors opinion? (yes = -1; no = 0) + material weakness? (yes = -1; no = 0) (assumed 0 because this is not reported in SNL Financial)
Component 2 =	company normal accruals / (company normal accruals + company abnormal accruals)
<i>Compliance</i>	
Component 1 =	company auditor's fees / company total assets
Component 2 =	company settlement net gain / company total assets

References

- AM Best (2013). Understanding BCAR For Property/Casualty Insurers. <http://www.ambest.com>. Accessed on 26 January 2014.
- Arnold, V. et al (2011). The role of strategic enterprise risk management and organizational flexibility in easing new regulatory compliance. *International Journal of Accounting Information Systems*, 12(3), 171-188.
- Aven, T. (2013). On the meaning and use of the risk appetite concept. *Risk Analysis*, 33(3), 462-468.
- Beasley, M. et al (2005). Enterprise risk management: An empirical analysis of factors associated with the extent of implementation. *Journal of Accounting and Public Policy*, 24, 521-531.
- Committee of Sponsoring Organization of the Treadway Commission (COSO) (2004). Enterprise Risk Management - Integrated Framework. <http://www.coso.org/guidance.htm>. Accessed on 26 January 2014.
- Committee of Sponsoring Organization of the Treadway Commission (COSO) (2012). Enterprise Risk Management - Understanding and Communicating Risk Appetite. <http://www.coso.org/guidance.htm>. Accessed on 26 January 2014.
- Doyle, J. et al (2007). Determinates of weakness in internal control over financial reporting. *Journal of Accounting and Economics*, 44, 193-223.
- Eckles, D. L. et al (2014). Reprint of: The impact of enterprise risk management on the marginal cost of reducing risk: Evidence from the insurance industry. *Journal of Banking and Finance*, 49, 409-423.
- EIOPA (F.K.A CEIOPS) (2010). QIS5 Technical Specifications. <https://eiopa.europa.eu/consultations/qis/quantitative-impact-study-5/technical-specifications/index.html>. Accessed on 26 January 2014.
- Field, A. (2009). *Discovering Statistics Using SPSS (3rd Edition)*. London: SAGE Publications Ltd.
- Gordon, L. et al (2009). Enterprise risk management and firm performance: A contingency perspective. *Journal of Accounting and Public Policy*, 28, 301-327.
- Ge, W. & McVay, S. (2005). The disclosure of material weakness in internal control after the Sarbanes-Oxley Act. *The Accounting Review*, 19(3), 137-158.
- Hillson, D. & Murray-Webster, R. (2012). *A Short Guide to Risk Management*. Surrey, England: Gower Publishing Limited
- Hoyt, R., & Liebenberg, A. (2011). The value of enterprise risk management. *Journal of Risk and Insurance*, 78(4), 795-822.
- Jorion, P. (2001). *Value at Risk – The new benchmark for managing financial risk*, 2nd Edition. New York: McGraw Hill.
- Liebenberg, A. & Hoyt, R. (2003). The determinants of enterprise risk management: Evidence from the appointment of chief risk officers. *Risk Management & Insurance Review*, 6(1), 37-52.
- McShane, M. et al (2011). Does enterprise risk management increase firm value. *Journal of Accounting, Auditing and Finance*, 26(4), 641-658.
- Meulbroek, L. (2002). A senior manager's guide to integrated risk management. *Journal of Applied Corporate Finance*, 14(4), 56-70.
- Myers, C. (2014). Enterprise risk (mis)management: Value implications of the misapplication of risk capacity. Working paper. University of Manchester, Manchester Business School, Manchester, England.
- Nocco, B. & Stulz, R. (2006). Enterprise risk management: Theory and practice. *Journal of Applied Corporate Finance*, 18(4), 8-20.
- Pagach, D. & Warr, R (2011). The characteristics of firms that hire chief risk officers." *Journal of Risk & Insurance*, 78(1), 185-211.
- Power, M. (2009). The risk management of nothing. *Accounting, Organizations and Society*, 34, 849-855
- Shang, K. & Chen, Z. (2012). Risk appetite: Linkage with strategic planning." *Society of Actuaries*. <http://www.soa.org>. Accessed on 26 January 2014.
- Standard & Poor's (2013a). Enterprise Risk Management. <http://standardandpoors.com/ratingsdirect>. Accessed on 26 January 2014.
- Standard & Poor's (2013b). Process improvements and regulation drive ERM of North American And Bermudian Insurers Forward. <http://standardandpoors.com/ratingsdirect>. Accessed on 26 January 2014.

IS BASEL THE RIGHT GATEWAY FOR A MORE EFFICIENT DEBT MARKET? AN INTERNATIONAL COMPARISON

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Abstract: *Current literature does not agree on the impact that Basel regulation is having onto the banking system, small and medium size enterprises (SMEs) and the single country economies. Moreover, recent crises cast some doubts on the efficacy of the regulation itself. With this paper, we investigate this issue by comparing the credit allocation capabilities of different countries. In particular, we compare two Anglo-Saxon Countries (the USA and the UK) with a group of eight European Countries where Basel rules are fully implemented. We find that, without the competition of well-developed risk capital markets, Basel regulation struggles to be effective.*

Keywords: *SMEs financing, Basel regulation, Ratings, Certainty Equivalent. JEL classification: G32, M10, G28*

Introduction

The objective of this study is to evaluate the efficacies of the developments of Basel regulation on both the banking system, small and medium size enterprises (SMEs) as well as the overall economy of ten Countries: a group of eight European Countries where Basel regulation is fully implemented (Germany, France, Italy, Spain, Hungary, Poland, the Czech Republic and Slovakia) and two Anglo-Saxon Countries where the above regulation is only partially implemented (USA and UK). In fact, if on one hand, the main objectives of Basel regulation are those of strengthening transparency and accountability, enhancing sound regulation, promoting integrity in financial markets, reinforcing international cooperation and reforming international financial institutions; on the other hand, the G20 leaders committed to ensuring that regulation is efficient, that it does not impede financial innovation and it supports the expansion of trade in financial services. We aim to contribute to the current literature debate with two research questions. The first one is a comparison of two systems (the Continental European and Anglo-Saxon ones) with different levels of application of the regulation itself and different corporate financial systems (the Anglo Saxon Countries being more capital market oriented while the European Countries being more banking centered). This is performed by intersecting two dimensions: the level of banks' financing, which is a proxy for the true banks' credit allocation ability and an innovative rating methodology (Mantovani and Castellan, 2015). The higher the intersection, the more efficient the country in allocating credit to SMEs. The second one is another comparison within the Countries, based on the level of efficiency according to Fisher Separation Theorem (1930) and the efficiency by Fama (1965).

We find several interesting results. First, we observe heterogeneity in the mix of explanatory variables for the asset-side capability of firms to perform in the long run. This has potential implications for the banking system because the current framework of Basel regulation is a one size fits all solution and banks of different Countries may require different credit ratings solution dependent on the inner characteristics of the corporate system of the specific country.

Second, we find that in the two Anglo-Saxon Countries (USA, UK) the allocation efficacy of the banking system is higher than that of Europe. This may mean that the competition of capital markets is stronger than regulation itself.

The rest of the paper is organized in the following sections: literature review, sample and methodology of analysis, empirical results, discussion and conclusions.

Market failures and Basel regulations: a literature review

The Basel Banking Accords are norms issued by the Basel Committee on Banking Supervision (BSBC) under the Bank of International Settlements (BIS) in Basel, Switzerland.

The Basel Committee of Banking Supervision was founded in 1974 by central bank governors of G10 countries. Its aim was to increase financial stability and the quality of banking supervision worldwide by setting minimum standards for the regulation and the supervision of banks. Capital adequacy soon became the main focus of the Committee's activities and in 1988 the Basel Capital Accord (also known as Basel I) was approved. It required a minimum capital ratio of capital to risk-weighted assets of 8%. The Accord was always evolving over time, and in 1999 the Committee issued a new Revised Capital Accord, (Basel II) which entered into force in 2004. Basel I, because of its simplicity and its underestimation of risks, was substituted by the new Accord.

The new framework was designed to improve the way in which regulatory capital requirements reflect underlying risks and to better address the financial innovation that had occurred in recent years. The changes aimed at rewarding and encouraging continuous improvements in risk measurement and control².

Given to financial crisis in 2010 the Basel Committee issued another accord, Basel III, with the purpose to improve the resilience of financial markets³. The implementation of Basel III started from January 2014; limited to the risk-based capital requirements.

Since the introduction of Basel II, it was predicted that large banks would have adopt an Internal Rating Based (IRB) system substituting the Standardized Approach (SA). Based on an analysis of Belgian banks, Masschelein (2003) concludes that IRBs seem to imply lower capital requirements thanks to more efficiency in measuring risks. Similarly, Allen et al. (2004) show that adopting a credit scoring system allows for a faster and less costly investment valuation. Berger et al. (2005), Cowan and Cowan (2006) and Frame et al. (2001) go a step further and, in analyzing the US market, conclude that adopting an external credit scoring system increases SMEs financing. For instance, Berger et al. (2005) find in a sample of US banks that the adoption of an external credit system contributed to a significant increase in SMEs financing over a three years cycle. Similar results were also reached by Cowan and Cowan (2006) who used a survey methodology for their analysis, and by Frame et al. (2001).

A larger issue is to determine which rating system to utilize (quantitative, qualitative or a mix of both). The literature concerning pure quantitative analysis is relatively well developed and it mainly concerns models of corporate bankruptcy prediction (Beaver, 1966; Altman 1968; Altman et al., 1977; Platt and Platt, 1990). Because of their relatively high discriminatory power, they are well accepted by the industry even if they present some disadvantages such as the lack of a theory that explains why and how certain financial factors are linked to corporate bankruptcy.

Given this unresolved puzzle in the literature, we notice that all studies focus mainly on the implication of Basel regulation to banks' capital requirement and little has been written on the issue of modelling credit risk specifically for SMEs. We aim to contribute to this issue by investigating two levels of efficacy of the Basel agreements: among Countries where regulation is different and within Countries where regulation is applied. In fact, our first research question is:

RQ1: how a set of Countries, where Basel accords are partially implemented (UK and USA), compares to a set of Countries where Basel regulation has been fully implemented (Italy, France, Spain, Germany, Slovakia, Hungary, Poland and the Czech Republic)?

The comparison analysis relates to the level of overlap between the amounts of financing actually received by companies (which, for the second group of Countries is a proxy for Basel regulation) and the merit of credit as assigned by an innovative forward-looking rating system as proposed by Mantovani and Castellan (2015).

Basel II introduced the possibility for banks to develop their own Internal Rating Based systems (IRB) next to the choice of directly using the Standardized Approach (SA), which relies on credit ratings of borrowers assigned by “external credit assessment institution (ECAIs)”. Both the above methods find their fundamentals on the concepts of probability of default, exposure at default and loss given default, which are well documented in the literature starting from the seminal work by Beaver (1966), Altman (1968) and Ohlson (1980) down to the more recent model by Altman and Sabato (2007), which is specific to SMEs. We think that one of the main shortcoming of these models is the fact that the horizon of analysis is limited to 12 months forwards. As stated above, we answer our first research question by using the methodology developed by Mantovani and Castellan (2015), which is forward looking by its nature and does not limit the risk assessment of a company to a one-year horizon. We think that this is particularly important to the universe of SMEs because, often times, successful ideas with a high profitability potential, require a longer time horizon to develop. Another area of investigation of this study is the level of efficiency of the financial system in different Countries. In fact, we formulate the second research question:

RQ2: which is the allocative contribution given by the Basel regulation within a group of Countries where regulation itself is applied: Italy, Germany, France, Spain, Slovakia, Hungary, Poland and the Czech Republic? And what about Anglo-Saxon Countries: United States and United Kingdom, where Basel regulations are partially applied?

These Countries are classified based on their level of capital allocation efficiency. We define capital allocation efficiency based on the Separation Theorem by Fisher (1930), which states that, given perfect and complete capital markets, the production decision is governed solely by the profit-maximization objective, while the consumption decision is governed solely by utility maximization. The two decisions are hence separated and independent, meanwhile the governance of risks is done by financial markets.

Sample and methodology of analysis

The sample under analysis covers data extracted from ORBIS database (edited by Bureau van Dijk⁴) for ten Countries: the United States of America (USA), the United Kingdom (UK), Italy, France, Spain, Germany, Hungary, the Czech Republic, Poland and Slovakia. Specifically, it includes manufacturing and service firms with unconsolidated balance sheet data for total assets, operating revenues, fixed assets, shareholder’s funds and cost of employees, over the period from 2006 to 2013⁵.

The sample is made of 80,464 firms: 3,174 firms in USA, 10,803 firms in UK, 15,998 firms in France, 13,847 firms in Italy, 7,569 firms in Spain, 6,713 firms in Germany, 6,751 firms in Hungary, 12,357 firms in Czech Republic, 2,051 firms in Poland and 1,201 firms in Slovakia. For each company, we consider a panel of 8 years data: 643,712 financial reports. Furthermore, in order to determine a long-term merit of credit, we used the same dataset to compute the spread between persistent ROI and T(ROI) through 25 indices typically used to describe the risk profile of a corporation for all the 643,712 financial reports, i.e. a total of 16,092,800 data.

In order to answer to our first research question, we rank firms in each Country according to their asset-side capability to perform in the long run. Such a capability is based on an integrated view of each firm to generate operating returns in terms of ROI as defined in equation [1]

$$ROI_t = \frac{EBIT_t}{(FIAS_t + WKCA_t + FIAS_{t-1} + WKCA_{t-1})/2} \quad [1]$$

Where $EBIT$ = Earnings before interest and taxes; $FIAS$ = Fixed Assets; $WKCA$ = Working Capital

The sustainability of the corporate performance is depicted in terms of $P(ROI) - T(ROI)$ difference, which is a proxy of the long term merit of credit for the firm according to Mantovani and Castellan (2015). $T(ROI)$ is the long term threshold ROI adjusted on a series of ratios that aim to capture ex ante corporate risk (see Appendix – Table 1 and Table 2). $T(ROI)$ is based on the confident equivalent, an original evolution of certainty equivalent proposed by Lintner (1965) to assess values incomplete markets.

To rank the firms' merit of credit, the zero level of the proxy [$P(ROI) - T(ROI)$] is considered. The higher the gap, the higher is the merit of credit. Then, this ranking is intersected with two indicators arranged around their median levels: 1) the Intensity of debt (equation [2]), as a proxy for the efficiency of the banking system to allocate the quantity of credit; 2) Price of Financing (equation [3]), as a proxy for the efficiency of the banking system to determine the price of credit allowances.

$$\text{Intensity of debt} = DEB/OPRE_t = \frac{[(NFP_t^* + NFP_{t-1}^*) / 2]}{OPRE_t} \quad [2]$$

$$\text{Price of Financing} = INT/DEB_t = \frac{INTE_t}{[(GFP_t^* + GFP_{t-1}^*) / 2]} \quad [3]$$

Where: GFP = Gross Financial Position = Loans + Long term debt; $OPRE$ = Operating Revenue
 $SHFD$ = Total Shareholder Funds

This comparison will result with a set of two matrices made of four quadrants. They allow us to determine the overlap between the true banks' credit allocation ability (horizontal matrix direction), with the optimal allocation as determined by the integrated rating methodology (vertical matrix direction). The two matrices are reported in the following box.

Table 1: Overlaps between Long Term Merit of Credit and Intensity of debt

		ROI - T(ROI)	
		Positive	Negative
DEB/OPRE _t	Higher	I. Firms with positive rating that raise more financial resources than sample average	II. Firms with negative rating that raise more financial resources than sample average
	Lower	III. Firms with positive rating that raise less financial resources than sample average	IV. Firms with negative rating that raise less financial resources than sample average

Table 2: Overlaps between Long Term Merit of Credit and Price of Financing

INT/DEB _t	ROI - T(ROI)	
	Positive	Negative
	Lower	Higher
	I. Firms with positive rating that pay less for their raised financial resources	II. Firms with negative rating that pay less for their raised financial resources
	III. Firms with positive rating that pay more for their raised financial resources	IV. Firms with negative rating that pay more for their raised financial resources

Countries are ranked according to three evidences emerging from the two matrixes:

- 1) **Risk of Default** (II quadrant of the quantity matrix), which indicates the percentage of firms that are given credit by the banking system, while the rating system assigns to them a negative ranking. This indicator reflects the potential “bad debt” for the banking system of the Country.
- 2) **Missing opportunities**: for this topic, we started from the III quadrant of the quantity matrix (which indicates the percentage of firms, which are not given credit by the banking system, while the rating system assigns to them a positive ranking) and we adjusted it by the real expected GDP growth of each Country. So, we found the opportunity cost of missing GDP growth for each Country.
- 3) **Inefficient Debt Pricing** (quadrant II over the sum of quadrants II & III of the price matrix), which indicates the percentage of firms that underpay their financial risks (quadrant II) over the total amount of mispriced bank allowances (quadrants II and III).

For research question two, we initially perform a series of panel regression to verify the level of efficiency of each Country under analysis, according to two steps.

As first, we tested the Fisher Separation Theorem (1930). The Capital Allocation Efficiency is supposed when there is no significant relationship between the return on investment ($ROI_{i,t}$) and the current mix of risks within a corporation but, at the same time, there is a significant relationship (adjusted R-squared greater than 10%) between the intensity of debt (Equation [2]) and corporate risks. In fact, in this situation, investment and financing decisions are independent. Entrepreneurs can be indifferent toward risks in their decision processes, since the investors control the level of risk by building up portfolio adjusted to their risk tolerance. To test this first block of the efficiency puzzle, we run two regressions: the former between $ROI_{i,t}$ (Equation [1]) and set of proxies of corporate risks; the latter between the Intensity of debt (Equation [2]) and the set of proxies.

As second, the financing efficiency, according to Fama (1970) standards, is considered. The strong form of efficiency cannot be detected, because the relations between expected returns and expected risks cannot be easily tested at the empirical level. Hence, only three tests are conducted: (i) semi strong form of efficiency, when financing decisions are dependent only on the current level of risks; (ii) weak form of efficiency, when financing decisions are also related to past risks; (iii) absence of efficiency, when there is no relationship between firm financing and its risks meanwhile there is evidence of a strong autocorrelation with past financing.

Following are the three panel regression models adopted for both the first step (ROI as dependent variable) and the second one (Intensity of debt as dependent variable):

- i. Semi strong form of efficiency: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$
- ii. Weak form of efficiency: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$
- iii. Absence of efficiency: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$

If a Country is not efficient at the first step, any regression for Intensity of debt will show low levels of adjusted R-squared. In this case, corporate managers have to intervene to adjust unfit equilibrium

and higher than 10% adjusted R-squared in regressions for ROI are expected. The same Country should miss the second step as well, showing higher adjusted R-squared for the second and the third regressions (“weak” and “absence”) if compared with the first (“semi-strong”), when run over the Intensity of debt.

Finally, we try to match empirical evidence from the two research questions. We compare the level of efficiency of the financial system with the of overlap between the true banks’ credit allocation capacity and the forward looking credit allocation methodology, as it results from investigations for research question one. If different but coherent evidences will emerge for the European and Anglo-Saxon Countries, than the Basel Regulation may not be the right gateway to an efficient debt market.

Empirical results

In order to answer to the first research question, we need to calculate T(ROI) (Mantovani and Castellan, 2015). Under a methodological point of view, this consists of applying a particular regression (Predictive Regression, here below, as in equation [4]) to each of the ten Countries in order to find the statistically significant indicators, which has the highest predictive power to estimate the future confident equivalent around ROI. The dependent variable is represented by the return on investment ($ROI_{i,t}$), while the independent variables (the vectors $X_{i,t}$) are a set of indices that are typically used to describe the risk profile of a corporation. They include operational risks, such as the degree of operating leverage and the absolute intensity of working capital, technological risks such as the absolute intensity of fixed assets and financial risks such as financial leverage and long-term debt rate (see Appendix – Table 1). For each of this independent variable, we consider the autoregressive component, also.

$$ROI_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t} \quad [4]$$

Table 3 presents the regression for each Country using to calculate T(ROI).

Table 3: Predictive Regressions for each Country

CZECH REPUBLIC			GERMANY			SPAIN			FRANCE			HUNGARY		
const	0.1748	***	const	0.1205	***	const	0.0731	***	const	0.1977	***	const	0.0701	***
	(0.0000)			(0.0000)			(0.0000)			(0.0000)			(0.0000)	
CA/FIAS _t	0.0003	**	WKCA/OPRE _{t-1}	-0.1608	***	CA/FIAS _t	0.0005	***	CA/CL _{t-1}	0.0065	***	FIAS/OPRE _t	0.0140	***
	(0.0132)			(0.0004)			(0.0000)			(0.0089)			(0.0000)	
EBIT/INT _t	0.0000	**	FIAS/OPRE _t	0.0120	***	DOL _t (price)	-0.0005	***	WKCA/OPRE _t	0.0189	***	DEB/EQUITY _t	-0.0046	***
	(0.0158)			(0.0001)			(0.0076)			(0.0009)			(0.0040)	
ROS _t	0.1057	***	DOL _t (price)	0.0018	***	FIAS/OPRE _t	-0.0009	***	WKCA/OPRE _{t-1}	-0.0514	**	ROE _t	0.0540	***
	(0.0000)			(0.0041)			(0.0000)			(0.0217)			(0.0000)	
TAX _t	0.0373	*	EBIT/INT _t	0.0001	***	DEB/OPRE _{t-1}	-0.0023	***	LEV _t	-0.0034	**	ROS _t	0.5599	***
	(0.0760)			(0.0000)			(0.0000)			(0.0361)			(0.0000)	
R-squared	0.0009		EBIT/INT _{t-1}	0.0001	***	DEB/EQUITY _t	-0.0008	***	DEB/OPRE _{t-1}	0.0026	*	ROS _{t-1}	0.1899	***
Adj. R-squared	0.0009			(0.0000)			(0.0024)			(0.0660)		---	(0.0000)	
F-stat (pvalue)	0.0000		ROE _t	0.0128	***	DEB/EQUITY _{t-1}	-0.0008	***	ROE _t	0.0167	***	R-squared	0.0458	
				(0.0038)		---	(0.0031)			(0.0005)		Adj. R-squared	0.0458	
			DEB/OPRE _{t-1}	-0.0456	***	ROE _t	0.0437	***	ROE _{t-1}	0.0277	***	F-stat (pvalue)	0.0000	
				(0.0000)			(0.0000)			(0.0000)				
			ROE _{t-1}	0.0121	***	ROE _{t-1}	0.0326	***	EBIT/INT _t	0.0000	***			
				(0.0050)			(0.0000)			(0.0000)				
			ROS _t	0.8364	***	EBIT/INT _{t-1}	0.0000	***	EBIT/INT _{t-1}	0.0000	***			
				(0.0000)			(0.0025)			(0.0001)				
			R-squared	0.0141		ROS _t	0.0923	***	ROS _{t-1}	0.0037	*			
			Adj. R-squared	0.0141			(0.0000)			(0.0580)				
			F-stat (pvalue)	0.0000		ROS _{t-1}	0.0177	***	R-squared	0.0021				
							(0.0000)		Adj. R-squared	0.0021				
						AV/STAF _t	0.0006	***	F-stat (pvalue)	0.0000				
							(0.0057)							
						AV/STAF _{t-1}	-0.0008	***						
							(0.0001)							
						R-squared	0.0642							
						Adj. R-squared	0.0641							
						F-stat (pvalue)	0.0000							

IS BASEL THE RIGHT GATEWAY FOR A MORE EFFICIENT DEBT MARKET? AN INTERNATIONAL COMPARISON

ITALY						POLAND			SLOVAKIA			UK			USA		
const	0.0995 (0.0000)	***	DEB/EBITDA _{t-1}	-0.0002 (0.0649)	*	const	0.0959 (0.0000)	***	const	0.0947 (0.0228)	**	const	0.1490 (0.0000)	***	const	-0.0664 (0.0227)	**
CA/FIAS _{t-1}	0.0002 (0.0000)	***	DEB/EQUITY _{t-1}	-0.0014 (0.0000)	***	CA/CL _{t-1}	0.0094 (0.0469)	**	CA/FIAS _{t-1}	0.0048 (0.0030)	***	CA/FIAS _t	0.0002 (0.0120)	**	CA/FIAS _t	-0.0595 (0.0000)	***
CA/CL _t	0.0131 (0.0000)	***	ROE _t	0.0210 (0.0000)	***	FIAS/OPRE _{t-1}	-0.0143 (0.0484)	**	WKCA/FIAS _{t-1}	-0.0051 (0.0300)	**	CA/FIAS _{t-1}	0.0003 (0.0173)	**	WKCA/OPRE _{t-1}	0.0610 (0.0000)	***
FCFO/OPRE _t	0.0108 (0.0000)	***	ROE _{t-1}	0.0142 (0.0000)	***	ROE _t	0.0466 (0.0000)	***	DOL _t (price)	-0.0107 (0.0000)	***	WKCA/FIAS _t	-0.0005 (0.0580)	*	WKCA/FIAS _t	0.0773 (0.0000)	***
DOL _t (volume)	-0.0001 (0.0509)	*	EBIT/INT _t	0.0000 (0.0000)	***	ROE _{t-1}	0.0378 (0.0000)	***	DOL _{t-1} (price)	0.0115 (0.0000)	***	ROS _t	0.6588 (0.0000)	***	INT/DEB _t	-0.0145 (0.0028)	***
DOL _t (price)	-0.0008 (0.0022)	***	EBIT/INT _{t-1}	0.0000 (0.0004)	***	EBIT/INT _t	0.0001 (0.0000)	***	EBIT/INT _{t-1}	0.0013 (0.0000)	***	ROS _{t-1}	0.7050 (0.0000)	***	DEB/OPRE _t	0.0222 (0.0000)	***
DOL _{t-1} (price)	-0.0005 (0.0831)	*	ROS _t	0.4515 (0.0000)	***	ROS _t	0.9930 (0.0000)	***	R-squared	0.0159		AV/STAF _t	0.0149 (0.0984)	*	DEB/OPRE _{t-1}	0.0126 (0.0000)	***
FIAS/OPRE _t	0.0172 (0.0000)	***	ROS _{t-1}	0.0652 (0.0005)	***	CRED-DEBD _t	-0.0086 (0.0000)	***	Adj. R-squared	0.0159		AV/STAF _{t-1}	-0.0172 (0.0534)	*	ROE _{t-1}	-0.0209 (0.0000)	***
FIAS/OPRE _{t-1}	-0.0130 (0.0000)	***	TAX _t	0.0051 (0.0129)	**	R-squared	0.0380		F-stat (pvalue)	0.0000		R-squared	0.0075		EBIT/INT _t	0.0001 (0.0000)	***
INT/DEB _t	0.0005 (0.0832)	*	TAX _{t-1}	0.0023 (0.0887)	*	Adj. R-squared	0.0380					Adj. R-squared	0.0075		AV/STAF _t	0.0022 (0.0077)	***
DEB/OPRE _t	0.0180 (0.0002)	***	RLFA _t	-0.0001 (0.0605)	*	F-stat (pvalue)	0.0000					F-stat (pvalue)	0.0000		R-squared	0.0515	
DEB/OPRE _{t-1}	-0.0315 (0.0000)	***	RFLA _{t-1}	-0.0002 (0.0430)	**										Adj. R-squared	0.0514	
DEB/EBITDA _t	-0.0002 (0.0389)	**	R-squared	0.0256											F-stat (pvalue)	0.0000	
			Adj. R-squared	0.0256													
			F-stat (pvalue)	0.0000													

Once T(ROI) is calculated, firms are ranked based on the variable $[P(ROI) - T(ROI)]$, which is the proxy for their long term merit of credit according to Mantovani and Castellan (2015). The ranking is compared to the effective debt allocation by banks. Table 4 presents the resulting empiricals based on tables 1 and 2, which intersect the above three dimensions.

Table 4: Allocative matrices

CZECH REPUBLIC	DEBT/OPRE		Rating	
			positive	negative
	higher		10.74%	46.71%
	lower		18.55%	23.99%
	INTE/DEBT		Rating	
			positive	negative
	lower		11.72%	37.21%
	higher		17.58%	33.49%
SPAIN	DEBT/OPRE		Rating	
			positive	negative
	higher		8.55%	43.11%
	lower		21.29%	27.05%
	INTE/DEBT		Rating	
			positive	negative
	lower		12.28%	38.27%
	higher		17.56%	31.89%
POLAND	DEBT/OPRE		Rating	
			positive	negative
	higher		13.25%	38.98%
	lower		20.06%	27.71%
	INTE/DEBT		Rating	
			positive	negative
	lower		13.01%	38.25%
	higher		20.26%	28.48%
HUNGARY	DEBT/OPRE		Rating	
			positive	negative
	higher		21.44%	48.94%
	lower		13.70%	15.92%
	INTE/DEBT		Rating	
			positive	negative
	lower		15.13%	35.80%
	higher		19.26%	29.81%
UNITED KINGDOM	DEBT/OPRE		Rating	
			positive	negative
	higher		10.04%	41.55%
	lower		19.66%	28.75%
	INTE/DEBT		Rating	
			positive	negative
	lower		14.00%	34.78%
	higher		15.64%	35.58%
GERMANY	DEBT/OPRE		Rating	
			positive	negative
	higher		10.47%	41.98%
	lower		20.80%	26.75%
	INTE/DEBT		Rating	
			positive	negative
	lower		10.68%	41.16%
	higher		20.59%	27.57%
FRANCE	DEBT/OPRE		Rating	
			positive	negative
	higher		13.47%	40.38%
	lower		22.56%	23.60%
	INTE/DEBT		Rating	
			positive	negative
	lower		16.61%	34.01%
	higher		19.35%	30.03%
ITALY	DEBT/OPRE		Rating	
			positive	negative
	higher		8.44%	41.81%
	lower		21.10%	28.65%
	INTE/DEBT		Rating	
			positive	negative
	lower		10.51%	39.70%
	higher		19.01%	30.78%
SLOVAKIA	DEBT/OPRE		Rating	
			positive	negative
	higher		10.69%	44.56%
	lower		17.64%	27.11%
	INTE/DEBT		Rating	
			positive	negative
	lower		12.18%	38.33%
	higher		16.12%	33.36%
USA	DEBT/OPRE		Rating	
			positive	negative
	higher		47.12%	9.78%
	lower		29.89%	13.21%
	INTE/DEBT		Rating	
			positive	negative
	lower		49.79%	7.16%
	higher		27.24%	15.81%

Tables 5 to 7 present the rankings of the Countries based on three different indicators as stated above in sample and methodology description, i.e. Risk of Default, Missing Opportunities and Inefficient Debt Pricing.

Table 5: Allocative rankings - Risk of Default

LEVEL OF DEBT		
Ranking	Country	Risk of Default (II Quadrant)
1	USA	9.78%
2	Poland	38.98%
3	France	40.38%
4	UK	41.55%
5	Italy	41.81%
6	Germany	41.98%
7	Spain	43.11%
8	Slovakia	44.56%
9	Czech Republic	46.71%
10	Hungary	48.94%

Table 6: Allocative Rankings – Missing Opportunities

LEVEL OF DEBT			
Ranking	Country	Expected GDP growth	Missing Opportunities
1	Italy	0.95%	0.25%
2	Hungary	2.25%	0.36%
3	France	1.40%	0.41%
4	Germany	1.75%	0.46%
5	Czech Republic	2.55%	0.58%
6	Slovakia	2.85%	0.61%
7	UK	2.50%	0.61%
8	Spain	2.40%	0.65%
9	Poland	3.00%	0.75%
10	USA	3.15%	1.34%

Table 7: Allocative Rankings – Inefficient Debt Pricing

PRICE OF DEBT		
Ranking	Country	Inefficient Debt Pricing (II/II & III Quadrant)
1	USA	20.80%
2	France	63.73%
3	Hungary	65.02%
4	Poland	65.38%
5	Germany	66.66%
6	Italy	67.62%
7	Czech Republic	67.91%
8	Spain	68.55%
9	UK	68.99%
10	Slovakia	70.40%

According to Table 5: (i) US firms are strongly different from the others in our sample; (ii) all Countries where Basel regulation is fully applied deploys similar empirical evidence; (iii) the UK case seems nearer to the Continental Europe evidence, but this is direct consequence of the characteristics in data sample, as discussed later.

Table 6 shows the value of Missing Opportunities as adjusted by the expected GDP growth of each Country; therefore, deploying the opportunity cost of missing such a growth. This tricky indicator contributes to the resulting evidence, as the Italian and USA case explain. The first position for Italian firms is driven by the low value of the GDP growth (0.95%), while good companies missing bank allowances are frequent (21.10%, Table 4). Conversely, the last position of USA is direct consequence of particularly high value of GDP growth and frequency of companies missing opportunities.

Finally, Table 7 presents the Inefficient debt pricing classification. As for Risk of default allocation, US firms are strongly different than the other, while all Countries (Basel regulated) are more similar.

We turn now to the second research question of the study, where we attempt at grading the efficacy of Basel regulation within the Countries under analysis. Table 8, helps us to classify each Country according to the two steps of efficiency as identified in the section describing the model of analysis (financing efficiency and capital allocation efficiency)⁶.

Table 8: Adjusted R-squared of the test of efficiency of Financial System on a Country by Country basis

CZECH REPUBLIC	DEBT/OPRE	ROI	GERMANY	DEBT/OPRE	ROI
Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.1602	0.0332	Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.4672	0.0151
Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.1644	0.0751	Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.3743	0.0372
Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.7700	0.0655	Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.4021	0.0710
SPAIN	DEBT/OPRE	ROI	FRANCE	DEBT/OPRE	ROI
Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.4928	-0.0007	Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.4865	-0.0004
Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.5605	0.0888	Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.9854	-0.0009
Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.5030	-0.0009	Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.5056	-0.0004
HUNGARY	DEBT/OPRE	ROI	ITALY	DEBT/OPRE	ROI
Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.3128	0.0897	Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.4627	0.0366
Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.3523	0.5119	Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.5054	0.0435
Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.7622	0.4594	Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.7569	0.0536
POLAND	DEBT/OPRE	ROI	SLOVAKIA	DEBT/OPRE	ROI
Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.2856	0.2335	Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.3138	0.3591
Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.4160	0.3734	Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.4426	0.3268
Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.8794	0.4991	Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.6830	0.3372
UK	DEBT/OPRE	ROI	USA	DEBT/OPRE	ROI
Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.2283	0.0032	Semi-strong: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \varepsilon_{i,t}$	0.3999	0.2150
Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.3942	0.0161	Weak: $Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + \beta_2 X_{i,t-1} + \varepsilon_{i,t}$	0.9417	0.2154
Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.3607	0.0659	Absence: $Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 X_{i,t} + \varepsilon_{i,t}$	0.7020	0.3680

Based on the panel regressions results, we find that Germany, only, presents a semi-strong form of efficiency. We notice that this is the only Country where regression (i) has the highest adjusted R-squared (47%), if regressed on the Intensity of debt. Hence, we can say that, in Germany, financing decisions are related mainly to the current level of risks. In fact, when moving to regression (ii) for the weak and (iii) for the absence form of efficiency, R-squared decreases. At the second step of efficiency (i.e. Separation Theorem), Germany confirms efficiency. In fact, on one hand, financing decisions are strongly correlated with the mix of business risks and, on the other hand, the investment decisions are not correlated with risks. In this context, the management can take decisions in a risk neutral framework, since the appetite for risk of the financial system selects the investment worthiness.

Out of the European aggregate, France and Spain are the second ranked countries according to both the first and second steps of efficiency. As far as the financing efficiency is concerned, we classify the two Countries as having a “weak form of efficiency.” If we compare the adjusted R-squared in regression applied to Intensity of debt, the regression (ii) has the highest one (France: 99%; Spain: 56%). Hence, we can say that in these Countries financing decisions relate to both current and past risks. Additionally, in these two Countries, there is also capital allocation efficiency given that the separation between investment and financing decisions works.

Poland, Czech Republic, Hungary and Slovakia, are the worst ones in terms of financing efficiency. In fact, the regression (iii) has the highest adjusted R-squared (Poland: 88%; Czech Republic: 77%; Hungary: 76%; Slovakia: 68%). This means that banks are not interested in present or past risks but they decide according to an incremental approach, by considering their past decisions, only. Additionally, the separation between investing and financing decisions is not present. Both decisions are correlated with the mix of business risks.

Italy is an intermediate and anomalous case: while there is no financing efficiency (the regression on the “absence of efficiency” has the highest R-squared equal to 76%), the separation of investing and financing decisions seems to work. In fact, investing decisions are neutral toward risks while financing relate strongly with past decisions.

By looking at Anglo-Saxon Countries we find that, while both can be classified as having a weak form of efficiency, in UK the separation between investing and financing decisions seems to work, but not the same for USA.

Discussing the empirical evidence

The classification of financing efficiency, as reported in Table 8, let us run some cross-checks with results in Tables 5 to 7, i.e. with the rankings based on Risk of Default, Missing Opportunities and Inefficient Debt Pricing.

Looking at the ranking based on “Risk of Default”, you may find clear relationships with the efficiency degree of each Country as defined in term of better debt allocating system. In fact, USA, France and UK are among the top five Countries in Table 5.

By considering the “Missing Opportunities” indicator, the situation is slightly different. Some of the Countries with the worst situation in terms of Risk of Default, are on the top of the ranking stated in Table 6 and vice versa. However, we want to underline, as mentioned above, that the rankings are adjusted by the Expected GDP growth. It is important to understand that the first rank for Italy it is not due to a low value of missing opportunities, but it is due to the low value of the expected GDP growth. At the same time, the last position of USA is affected by the higher value of the expected GDP growth and not by the higher value of missing opportunities.

Lastly, focusing on “Inefficient Debt Pricing” (Table 7), you find proof that some of the most efficient Countries have a better debt allocating system if compared to the less efficient ones.

The only exception for any cross-check is the case of Germany, where you must also consider qualitative factors in the German practice of evaluating the firms’ merit of credit. In our model these kind of factors are not included, this is why we obtained results apparently contrasting: Germany is ranked as an intermediate Country in Risk of Default (Table 5), Missing Opportunities (Table 6) and Inefficient Debt Pricing (Table 7), while looking at the whole system, Germany presents a semi-strong form of efficiency (Table 8). Future research will attempt at improving the Rating methodology for Germany by adding qualitative factors to narrow the gaps.

More discussions about the results from the intersection of the efficiency level of each Country (Table 8) and the rankings (Tables from 5 to 7), it is important to control some specificities of the Anglo Saxon Countries (UK and USA) versus the European Countries. In fact, analyzing the data we observed that the UK and the USA have both a lower level of debt financing compared to the European aggregate. To confirm this observation, we perform a t-test of difference on the gross level of debt (Equation [5]) of three groups of Countries: USA, UK and Europe.

$$\text{Gross Debt – to – equity ratio} = GDEB/EQUITY_t = GFP_t / SHFD_t \quad [5]$$

This control is required since the financial systems of the Anglo-Saxon Countries (i.e. USA and UK, where Basel regulation is not fully applied) are more market-oriented than those of the other Countries (more banking-oriented). Accordingly, the use of equity in corporate financing is wider. Companies using more equity should have lower than level-1 debt-to-equity ratio. This is direct consequence of the expectation that Anglo-Saxon Countries may have more developed equity capital markets (e.g. private equity and stock listing). Equity may compete with banks in fund provisioning and, this way, being more disciplinant in controlling the corporate risk sharing inside the financial system than the Basel practices are. In fact, we should find out that the Anglo-Saxon Countries present a lower amount of debt financing and, at the same time, a bigger efficiency in its allocation, we will be able to grade more the true efficacy of Basel regulation.

One issue with comparing sample means is the fact that the UK average value for the gross debt-to-equity ratio (Equation [5]) is biased by few outliers. For this reason, we truncate the sample by

eliminating 10% of the outer tails (5% of each side of the distribution, hence retaining 90% of the data).

The hypothesis of the t-test is as follows:
$$\begin{cases} H_0: \mu_i \leq \mu_j \\ H_1: \mu_i > \mu_j, \end{cases}$$

Where μ represents the gross level of debt to equity ratio (Table 9) in our sample.

Table 9: t-test of difference on sample means-GDEB/EQUITY

Sample	Sample mean (complete sample)	90% sample in the middle (quantiles)
EU	1.36	na
UK	8.93	0.95
USA	-0.14	na

Samples without "anoumalous" firms			
Compared samples	t-stat	95% confidence interval	p-value
UK vs USA	1.724243728	$[-\infty, 2.1363]$	0.9577
UK vs EU	-2.031546821	$[-\infty, -0.0771]$	0.0211
USA vs EU	-2.254599271	$[-\infty, -0.40502]$	0.0121

Table 9 confirms that both the US and the UK have lower bank debt financing practices as compared to Europe. This implies that these two Anglo-Saxon Countries have more developed capital markets (via private equity or public markets), which are key competitors to the banking system. This has key implications on the efficacy of Basel regulation, as we shall see from the results of our rankings.

The empirical data for both the UK and the US are classifiable as having a weak form of efficiency, given that the regression on these form of efficiency are the ones with the highest R squared (USA:94%, UK:39% Table 8). Differently, while the UK is also efficient from a capital allocation perspective, the USA is not, given that both investing and financing decisions are correlated with the mix of business risks.

Given this evidences, we estimate the allocation matrices adjusted by debt-to-equity ratio for both USA and UK. (Table 10 and 11).

Table 10: Allocative matrices adjusted by debt-to-equity ratio – USA

DEB/EQUITY<1	DEBT/OPRE	Rating		
		positive	negative	
	higher	40.44%	8.32%	
	lower	35.91%	15.33%	
DEB/EQUITY>1	DEBT/OPRE	Rating		
		positive	negative	
	higher	78.04%	16.55%	
	lower	2.03%	3.38%	
DEB/EQUITY<1	INTE/DEBT	Rating		
		positive	negative	
	lower	45.76%	6.07%	
	higher	30.56%	17.62%	
DEB/EQUITY>1	INTE/DEBT	Rating		
		positive	negative	
	lower	77.99%	8.49%	
	higher	13.51%	n.a.	

Table 11: Allocative matrices adjusted by debt-to-equity ratio - UK

DEB/EQUITY<1	DEBT/OPRE		Rating	
			positive	negative
		higher	7.88%	28.89%
		lower	25.72%	37.51%
DEB/EQUITY>1	DEBT/OPRE		Rating	
			positive	negative
		higher	15.12%	71.30%
		lower	5.42%	8.16%
DEB/EQUITY<1	INTE/DEBT		Rating	
			positive	negative
		lower	14.64%	31.23%
		higher	18.54%	35.59%
DEB/EQUITY>1	INTE/DEBT		Rating	
			positive	negative
		lower	21.88%	64.01%
		higher	14.11%	n.a.

Substituting these results in Table 5 we note that the USA and the UK rank in the first two positions of the “Risk of Default” (USA= 8%; UK =29%. Table 12).

Table 12: Adjusted allocative rankings - Risk of Default

LEVEL OF DEBT		
Ranking	Country	Risk of Default (II Quadrant)
1	USA	8.32%
2	UK	28.89%
3	Poland	38.98%
4	France	40.38%
5	Italy	41.81%
6	Germany	41.98%
7	Spain	43.11%
8	Slovakia	44.56%
9	Czech Republic	46.71%
10	Hungary	48.94%

Therefore, we can conclude that Anglo-Saxon Countries, where Basel regulation is not fully applied, present a more developed equity market and more efficiency in debt allocation.

Concluding remarks

This paper aims to detect if the Basel regulation really contributes to the efficiency of the financial system, particularly the banking sector and the credit for small and medium size enterprises. By comparing empirical evidences in Anglo-Saxon Countries and Continental Europe ones, we give some insights, since the formers (USA, particularly) adopt the Basel framework less intensively, while the latters fully adopt it.

While the Basel-adopting Countries strike-out more homogenous results, the USA case clearly diverts from standards and UK case gives no unique tendency because of sample composition. USA appears more efficient in allocating the bank allowances (i.e. data show lower risk of default and lower mispricing). Minor diversions are reported for missing opportunities, even if the more efficient US equity market may explain this evidence: high growth companies access equity financing. As final concluding remark, we can state that a stronger competition between debt and equity funding could contribute more than further banking regulation to achieve higher efficiency of the financial system. Benefits could be particularly strong for small and medium enterprises.

Appendix

Table 1 - (extract from Mantovani and Castellan, 2015)

Index	Unit	Formula derived from ORBIS	Definition
Technology features			
CA/FIAS _t	%	CUAS _t /FIAS _t	Current rate of assets
CA/CL _t	%	CUAS _t /CULI _t	Current equilibrium
WKCA/FIAS _t	%	WKCA _t /FIAS _t	Relative intensity of working capital
FIAS/OPRE _t	%	$\frac{[(FIAS_t + FIAS_{t-1}) / 2]}{OPRE_t}$	Absolute intensity of fixed assets
RLFA _t	--	$\frac{[(FIAS_t + FIAS_{t-1}) / 2]}{DEPR_t}$	Residual Life of Fixed Assets
Financial strategy			
DEB/EBITDA _t	--	$\frac{[(NFP_t^* + NFP_{t-1}^*) / 2]}{EBTA_t}$	Years for debt re-financing
DEBLT _t	%	CUAS _t /NFP _t [*]	Long term debt rate
DEB/EQUITY _t	--	NFP _t [*] /SHFD _t	Debt-to-equity ratio
DEB/OPRE _t	--	$\frac{[(NFP_t^* + NFP_{t-1}^*) / 2]}{OPRE_t}$	Intensity of debt
LEV _t	--	$\frac{OPPL_t}{OPPL_t - INTE_t}$	Financial leverage
INTE/DEB _t	%	$\frac{INTE_t}{[(NFP_t^* + NFP_{t-1}^*)/2]}$	Financial interest rate
Operating risks			
WKCA/OPRE _t	%	$\frac{[(WKCA_t + WKCA_{t-1}) / 2]}{OPRE_t}$	Absolute intensity of working capital
DOL – volume _t	--	AV _t /OPPL _t	Degree of operative leverage on volume changes
DOL – price _t	--	$\left[\frac{MDCU_t^{***}}{(MDCU_t^{***} - x)} - 1 \right] * 100$	Degree of op. lev. on price changes of x (x=1%)
CRED – DEBT _t	dd	$\frac{(CRED_t + CRED_{t-1})/2}{MATE_t/365} - \frac{(DEBT_t + DEBT_{t-1})/2}{--}$	Difference between delays on payments to creditors and payments from debtors
Rate of return			
ROI _t	%	$\frac{OPPL_t}{[(CIN_t^{***} + CIN_{t-1}^{***})/2]}$	Return on Investment
Adjusted ROI _t	%	$\frac{EBTA_t - STOK_t + STOK_{t-1}}{[(CIN_t^{****} + CIN_{t-1}^{****})/2]}$	Alternative Return on Investment
ROE _t	%	$\frac{PL_t}{[(SHFD_t + SHFD_{t-1})/2]}$	Return on Equity
ROS _t	%	OPPL _t /OPRE _t	Return on Sales
AV/STAF _t	%	AV _t /STAF _t	Work productivity (cost of employees)

AV/EMPL _t	%	AV/EMPL _t	Work productivity (number of employees)
EBIT/INT _t	--	OPPL _t /INTE _t	Interest Coverage
FCFC/OPRE _t	%	$\frac{EBTA_t + WKCA_{t-1} - WKCA_t}{OPRE_t}$	Margin of Free Cash Flow Characteristic
FCFO/OPRE _t	%	$\frac{FCFC_t - (DEPR_t + FIAS_t - FIAS_{t-1})}{OPRE_t}$	Margin of Free Cash Flow Operative
TAX _t	%	TAXA _t /OPPL _t	Tax rate
<i>Self elaborated account values</i>			
*NFP _t	€	LOAN _t + LTDB _t – CASH _t	Net Financial Position
**GFP _t	€	LOAN _t + LTDB _t	Gross Financial Position
***MDCU _t	%	AV _t /OPRE _t	Contribution Margin
****CIN _t	€	FIAS _t + WKCA _t	Total Net Investments

Tables 2 - Descriptive statistics for the final sample

Italy	Weighted				France	Weighted			
	Mean	Mean	Median	Standard Deviation		Mean	Mean	Median	Standard Deviation
CA/FIAS _t	8.06	7.39	2.63	25.06	CA/FIAS _t	38.91	38.64	4.89	388.53
CA/CL _t	1.69	1.71	1.23	37.31	CA/CL _t	4.59	1.61	1.33	4962.96
WKCA/OPRE _t	0.23	0.23	0.19	0.33	WKCA/OPRE _t	0.24	0.19	0.11	9.63
WKCA/FIAS _t	2.97	2.86	0.80	11.71	WKCA/FIAS _t	9.41	9.13	0.85	111.71
CRED-DEBD _t	130.03	127.78	77.64	189.88	CRED-DEBD _t	34271.30	41925.00	189.48	700871.00
DEBL _t	0.24	0.26	0.00	2.68	DEBL _t	0.14	0.15	0.00	4.67
FCFC/OPRE _t	0.08	0.08	0.07	0.19	FCFC/OPRE _t	0.07	0.07	0.07	18.14
FCFO/OPRE _t	0.00	0.00	0.02	0.63	FCFO/OPRE _t	12.39	6.11	0.04	3951.62
LEV _t	1.30	1.31	1.10	10.57	LEV _t	1.06	1.05	1.01	2.08
DOL _t (volume)	6.72	6.96	5.08	44.12	DOL _t (volume)	9.55	8.82	4.77	312.38
DOL _t (price)	4.97	4.74	3.46	12.34	DOL _t (price)	2.97	3.12	2.10	5.31
FIAS/OPRE _t	0.51	0.49	0.20	1.37	FIAS/OPRE _t	1.90	1.29	0.09	76.72
INTE/DEB _t	-0.14	-0.11	0.04	2.53	INTE/DEB _t	-0.04	-0.05	0.00	7.36
DEB/OPRE _t	0.19	0.19	0.09	0.59	DEB/OPRE _t	-0.11	-0.07	-0.05	26.91
DEB/EBITDA _t	1.85	1.89	1.02	28.55	DEB/EBITDA _t	-1.77	-1.57	-0.58	65.71
DEB/EQUITY _t	1.82	1.77	0.39	7.65	DEB/EQUITY _t	-0.53	-0.32	-0.28	93.10
ROE _t	0.08	0.07	0.05	1.44	ROE _t	0.21	0.20	0.16	3.69
ROI _t	0.13	0.12	0.07	1.02	ROI _t	0.25	0.25	0.13	24.28
Adjusted ROI _t	0.21	0.20	0.14	1.54	Adjusted ROI _t	0.30	0.31	0.20	26.89
EBIT/INT _t	183.41	178.72	2.99	2354.44	EBIT/INT _t	1842.79	2275.80	10.65	35075.90
ROS _t	0.04	0.04	0.04	0.15	ROS _t	-0.02	0.01	0.04	9.80
TAX _t	0.37	0.38	0.37	1.97	TAX _t	0.16	0.16	0.22	5.98
AV/STAF _{t-1}	1.59	1.55	1.39	5.56	AV/STAF _{t-1}	2.05	2.24	1.19	20.22
AV/EMPL _t	59.80	59.59	51.14	46.75	AV/EMPL _t	n.a.	n.a.	n.a.	n.a.
RLFA _t	10.9729	10.732	6.32	19.2818	RLFA _t	94.6566	85.999	6.26461	1327.06

IS BASEL THE RIGHT GATEWAY FOR A MORE EFFICIENT DEBT MARKET? AN INTERNATIONAL COMPARISON

Spain	Mean	Weighted Mean	Median	Standard Deviation
CA/FIAS _t	6.62	7.08	1.13	34.64
CA/CL _t	5.64	4.57	1.61	25.86
WKCA/OPRE _t	0.77	0.63	0.25	6.50
WKCA/FIAS _t	3.51	3.75	0.46	25.97
CRED-DEBD _t	-7.09	-5.24	-15.49	143.18
DEBLT _t	0.51	0.53	0.63	12.23
FCFC/OPRE _t	0.17	0.15	0.12	5.72
FCFO/OPRE _t	-0.21	-0.17	0.05	8.64
LEV _t	1.60	1.52	1.07	19.19
DOL _t (volume)	5.67	6.01	3.13	43.64
DOL _t (price)	3.93	4.38	2.78	18.05
FIAS/OPRE _t	5.22	3.93	0.47	22.19
INTE/DEB _t	-0.12	-0.07	0.04	9.38
DEB/OPRE _t	1.38	1.13	0.17	8.65
DEB/EBITDA _t	2.65	2.39	1.36	36.60
DEB/EQUITY _t	0.95	0.86	0.24	15.37
ROE _t	0.06	0.07	0.05	3.17
ROI _t	0.10	0.11	0.05	6.03
Adjusted ROI _t	0.12	0.13	0.09	5.43
EBIT/INT _t	24.58	24.85	2.61	109.08
ROS _t	0.04	0.04	0.05	5.95
TAX _t	0.14	0.10	0.21	9.36
AV/STAF _{t-1}	3.79	3.50	1.55	14.82
AV/EMPL _t	n.a.	n.a.	n.a.	n.a.
RLFA _t	35.199	30.436	12.148	73.5458

Germany	Mean	Weighted Mean	Median	Standard Deviation
CA/FIAS _t	16.44	13.27	1.25	178.71
CA/CL _t	34.27	32.16	1.84	722.22
WKCA/OPRE _t	0.15	0.15	0.11	0.40
WKCA/FIAS _t	4.95	4.09	0.30	72.96
CRED-DEBD _t	1747.11	1476.60	20.73	43704.40
DEBLT _t	0.49	0.47	0.32	5.30
FCFC/OPRE _t	0.09	0.09	0.09	0.38
FCFO/OPRE _t	0.02	0.02	0.04	0.71
LEV _t	1.36	1.33	1.09	10.51
DOL _t (volume)	8.99	9.98	4.16	163.37
DOL _t (price)	3.99	3.90	2.67	75.48
FIAS/OPRE _t	7.17	3.13	0.27	726.14
INTE/DEB _t	-1.17	-1.20	0.04	17.09
DEB/OPRE _t	0.47	0.36	0.03	4.89
DEB/EBITDA _t	1.21	1.03	0.33	14.22
DEB/EQUITY _t	0.67	0.57	0.06	9.78
ROE _t	0.17	0.16	0.06	2.62
ROI _t	0.16	0.14	0.08	5.51
Adjusted ROI _t	0.28	0.27	0.15	5.00
EBIT/INT _t	1420.66	1281.60	3.71	65250.60
ROS _t	0.05	0.06	0.05	2.61
TAX _t	0.20	0.19	0.15	5.04
AV/STAF _{t-1}	4.99	3.12	1.36	134.27
AV/EMPL _t	110.21	95.62	68.65	225.88
RLFA _t	74.069	52.111	8.53863	1450.34

Poland	Mean	Weighted Mean	Median	Standard Deviation
CA/FIAS _t	8.04	5.89	1.50	31.62
CA/CL _t	2.46	2.27	1.57	3.07
WKCA/OPRE _t	0.13	0.13	0.11	0.16
WKCA/FIAS _t	2.79	2.07	0.52	13.32
CRED-DEBD _t	489.13	464.54	41.37	1810.57
DEBLT _t	0.24	0.23	0.00	1.22
FCFC/OPRE _t	0.09	0.09	0.08	0.13
FCFO/OPRE _t	0.05	0.04	0.04	0.26
LEV _t	1.16	1.16	1.04	1.24
DOL _t (volume)	6.49	7.04	3.51	50.87
DOL _t (price)	n.a.	n.a.	n.a.	n.a.
FIAS/OPRE _t	0.59	0.66	0.20	1.12
INTE/DEB _t	-0.25	-0.29	0.00	15.80
DEB/OPRE _t	0.01	0.01	-0.01	0.27
DEB/EBITDA _t	0.10	0.06	-0.04	8.85
DEB/EQUITY _t	0.05	0.05	-0.03	1.17
ROE _t	0.20	0.17	0.13	0.63
ROI _t	0.25	0.21	0.12	0.80
Adjusted ROI _t	0.32	0.28	0.21	0.96
EBIT/INT _t	172.61	184.94	10.08	763.80
ROS _t	0.06	0.06	0.05	0.10
TAX _t	0.19	0.18	0.19	0.49
AV/STAF _{t-1}	2.17	2.21	1.52	3.25
AV/EMPL _t	27047.90	26523.00	19851.40	24765.70
RLFA _t	46.182	50.543	7.24761	204.238

Czech Republic	Mean	Weighted Mean	Median	Standard Deviation
CA/FIAS _t	8.84	8.20	1.56	53.59
CA/CL _t	2.92	2.84	1.74	4.12
WKCA/OPRE _t	0.14	0.14	0.09	0.59
WKCA/FIAS _t	1.85	1.80	0.38	9.70
CRED-DEBD _t	291.90	300.98	13.02	2385.10
DEBLT _t	0.16	0.16	0.00	7.31
FCFC/OPRE _t	0.09	0.09	0.08	0.22
FCFO/OPRE _t	0.01	0.02	0.03	0.43
LEV _t	1.18	1.18	1.05	1.75
DOL _t (volume)	6.70	6.59	4.22	28.57
DOL _t (price)	4.22	4.47	2.98	7.90
FIAS/OPRE _t	0.72	0.63	0.22	3.06
INTE/DEB _t	0.02	0.02	0.02	2.90
DEB/OPRE _t	0.02	0.02	-0.02	0.86
DEB/EBITDA _t	-0.26	-0.16	-0.23	16.15
DEB/EQUITY _t	0.03	0.06	-0.07	2.69
ROE _t	0.17	0.15	0.09	5.88
ROI _t	0.35	0.32	0.11	4.91
Adjusted ROI _t	0.45	0.42	0.19	5.01
EBIT/INT _t	103.97	116.48	6.52	1149.30
ROS _t	0.05	0.05	0.04	0.16
TAX _t	0.12	0.13	0.14	0.27
AV/STAF _{t-1}	1.71	1.71	1.38	2.91
AV/EMPL _t	21.60	22.58	16.90	17.91
RLFA _t	19.954	17.913	7.4422	112.91

Hungary	Mean	Weighted Mean	Median	Standard Deviation
CA/FIAS _t	4.55	32.16	1.17	24.36
CA/CL _t	1.92	2.36	1.32	2.34
WKCA/OPRE _t	0.15	0.19	0.13	0.14
WKCA/FIAS _t	1.20	6.92	0.40	4.19
CRED-DEBD _t	355.04	3938.40	26.17	2070.80
DEBLT _t	0.09	0.15	0.00	0.68
FCFC/OPRE _t	0.10	0.08	0.08	0.12
FCFO/OPRE _t	0.04	-0.02	0.04	0.18
LEV _t	1.28	1.20	1.09	2.87
DOL _t (volume)	7.34	19.68	3.96	62.67
DOL _t (price)	5.18	4.13	3.66	11.23
FIAS/OPRE _t	0.44	0.90	0.29	0.56
INTE/DEB _t	-0.17	-2.05	0.05	2.82
DEB/OPRE _t	-0.02	0.07	-0.02	0.20
DEB/EBITDA _t	-0.19	0.65	-0.25	7.39
DEB/EQUITY _t	-0.07	0.13	-0.08	1.12
ROE _t	0.18	0.93	0.11	1.11
ROI _t	0.14	0.24	0.09	0.54
Adjusted ROI _t	0.22	0.32	0.17	0.59
EBIT/INT _t	268.35	292.38	4.44	5633.74
ROS _t	0.06	0.01	0.05	0.10
TAX _t	0.09	0.15	0.07	0.34
AV/STAF _{t-1}	2.17	19.50	1.58	5.29
AV/EMPL _t	22588.00	31543.00	16086.50	26255.90
RLFA _t	11.0551	47.735	7.36826	55.2886

UK	Mean	Weighted Mean	Median	Standard Deviation
CA/FIAS _t	73.16	61.73	2.45	902.54
CA/CL _t	7.05	6.77	1.31	157.89
WKCA/OPRE _t	0.20	0.19	0.08	1.39
WKCA/FIAS _t	11.92	10.25	0.29	276.70
CRED-DEBD _t	61.61	62.38	42.47	86.97
DEBLT _t	0.39	0.39	0.03	2.99
FCFC/OPRE _t	0.08	0.09	0.08	0.86
FCFO/OPRE _t	0.05	0.06	0.05	1.55
LEV _t	0.79	0.88	1.02	40.49
DOL _t (volume)	5.21	5.42	3.36	68.01
DOL _t (price)	4.15	4.09	2.62	14.65
FIAS/OPRE _t	2.92	2.72	0.16	38.68
INTE/DEB _t	0.04	0.04	0.04	0.96
DEB/OPRE _t	1.72	1.57	0.15	10.19
DEB/EBITDA _t	2.36	2.35	0.91	33.26
DEB/EQUITY _t	4.04	4.84	0.18	606.54
ROE _t	0.84	0.47	0.11	89.47
ROI _t	0.16	0.16	0.08	19.34
Adjusted ROI _t	0.37	0.34	0.17	10.42
EBIT/INT _t	131.51	124.51	3.07	1653.19
ROS _t	0.01	0.02	0.05	2.54
TAX _t	0.18	0.18	0.22	1.82
AV/STAF _{t-1}	1.86	1.85	1.30	6.38
AV/EMPL _t	86474.70	87789.00	54900.80	200312.00
RLFA _t	103.085	91.619	6.62797	820.71

Slovakia	Mean	Weighted Mean	Median	Standard Deviation
CA/FIAS _t	4.25	4.00	1.08	9.64
CA/CL _t	1.76	1.75	1.28	1.62
WKCA/OPRE _t	0.16	0.16	0.12	0.51
WKCA/FIAS _t	1.16	1.14	0.36	3.53
CRED-DEBD _t	941.33	842.07	53.20	4473.58
DEBLT _t	0.17	0.18	0.00	0.67
FCFC/OPRE _t	0.14	0.14	0.11	0.49
FCFO/OPRE _t	0.01	0.01	0.04	0.77
LEV _t	1.23	1.23	1.06	1.22
DOL _t (volume)	6.46	6.50	3.46	30.06
DOL _t (price)	4.69	4.61	3.33	7.66
FIAS/OPRE _t	1.05	1.02	0.35	4.44
INTE/DEB _t	-0.14	3508.60	0.02	3.12
DEB/OPRE _t	0.02	-0.16	-0.01	0.62
DEB/EBITDA _t	-0.13	0.03	-0.07	11.98
DEB/EQUITY _t	0.14	-0.04	-0.02	2.16
ROE _t	0.16	0.18	0.09	0.64
ROI _t	0.17	0.15	0.08	1.00
Adjusted ROI _t	0.31	0.15	0.20	1.70
EBIT/INT _t	168.73	0.29	6.11	6013.07
ROS _t	0.05	203.52	0.05	0.35
TAX _t	0.14	0.05	0.16	0.25
AV/STAF _{t-1}	2.67	0.14	1.54	8.14
AV/EMPL _t	n.a.	n.a.	n.a.	n.a.
RLFA _t	10.0654	2.6924	5.8829	21.6425

USA	Mean	Weighted Mean	Median	Standard Deviation
CA/FIAS _t	3.47	2.85	0.88	9.67
CA/CL _t	2.97	2.90	1.82	8.18
WKCA/OPRE _t	0.14	0.15	0.12	0.22
WKCA/FIAS _t	1.18	0.98	0.28	3.53
CRED-DEBD _t	n.a.	n.a.	n.a.	n.a.
DEBLT _t	0.50	0.55	0.00	2.54
FCFC/OPRE _t	-0.03	0.03	0.11	1.07
FCFO/OPRE _t	-0.19	-0.12	0.02	1.24
LEV _t	1.07	1.11	1.01	1.74
DOL _t (volume)	1.86	2.14	1.18	6.08
DOL _t (price)	3.86	4.77	2.33	32.00
FIAS/OPRE _t	1.72	1.58	0.49	6.92
INTE/DEB _t	-0.33	-0.11	0.05	7.44
DEB/OPRE _t	-0.04	0.00	0.05	9.24
DEB/EBITDA _t	0.79	0.93	0.53	16.11
DEB/EQUITY _t	0.11	0.17	0.01	12.32
ROE _t	0.14	0.09	0.08	8.61
ROI _t	0.06	0.06	0.07	1.11
Adjusted ROI _t	n.a.	n.a.	n.a.	n.a.
EBIT/INT _t	-2.30	17.63	2.27	404.07
ROS _t	-1.85	-0.82	0.04	27.79
TAX _t	0.12	0.15	0.08	0.59
AV/STAF _{t-1}	6.13	10.17	1.34	46.88
AV/EMPL _t	n.a.	n.a.	n.a.	n.a.
RLFA _t	20.364	17.986	10.5891	71.3343

IS BASEL THE RIGHT GATEWAY FOR A MORE EFFICIENT DEBT MARKET? AN INTERNATIONAL COMPARISON

Table 3 - Results of the test of efficiency of Financial System on a Country by Country basis

CZECH REPUBLIC	Semi-strong		Weak		Absence	
Variable	ROI _t	DEB/OPRE _t	ROI _t	DEB/OPRE _t	ROI _t	DEB/OPRE _t
const	0.1924 *** (0.0000)	0.0169 * (0.0412)	0.1842 *** (0.0000)	-0.0210 (0.0606)	0.1847 *** (0.0000)	-0.0208 *** (0.0078)
CA/FIAS _t	0.0002 (0.1267)	0.0000 (0.9530)	0.0004 * (0.0519)	0.0000 (0.7052)	0.0004 *** (0.0006)	0.0000 (0.6414)
CA/FIAS _{t-1}			-0.0001 (0.7796)			
CA/CL _t	0.0021 (0.3649)	0.0044 *** (0.0002)	0.0050 (0.1752)	0.0061 ** (0.0010)	0.0040 (0.2351)	0.0096 *** (0.0000)
CA/CL _{t-1}			-0.0029 (0.3254)			
WKCA/OPRE _t	-0.1305 *** (0.0042)	0.1213 *** (0.0000)	-0.2008 ** (0.0137)	0.7697 *** (0.0000)	-0.1806 *** (0.0014)	0.3970 *** (0.0000)
WKCA/OPRE _{t-1}			0.0490 (0.5117)			
WKCA/FIAS _t	-0.1305 ** (0.0437)	-0.0004 (0.1783)	0.0009 (0.2527)	-0.0006 (0.1413)	0.0002 (0.7217)	-0.0005 * (0.0557)
WKCA/FIAS _{t-1}			-0.0007 (0.4152)			
CRED-DEBD _t	-0.0002 (0.5897)	0.0014 *** (0.0000)	-0.0001 (0.9203)	0.0020 *** (0.0000)	-0.0002 (0.6552)	0.0015 *** (0.0000)
CRED-DEBD _{t-1}			-0.0004 (0.7750)			
DEBLT _t						
DEBLT _{t-1}						
FCFC/OPRE _t						
FCFC/OPRE _{t-1}						
FCFO/OPRE _t	0.0268 * (0.0667)	-0.0491 *** (0.0000)	0.0083 (0.7275)	0.0568 *** (0.0000)	0.0045 (0.8254)	0.0532 *** (0.0000)
FCFO/OPRE _{t-1}			0.0026 (0.8757)			
LEV _t	-0.0011 (0.7754)	0.0033 (0.1012)	-0.0007 (0.8736)	0.0033 (0.1443)	-0.0010 (0.8236)	0.0018 (0.3145)
LEV _{t-1}			-0.0014 (0.7566)			
DOL _t (volume)	0.0000 (0.9832)	-0.0001 (0.4652)	0.0000 (0.9943)	-0.0001 (0.6563)	0.0000 (0.9998)	0.0000 (0.8354)
DOL _{t-1} (volume)			-0.0001 (0.6293)			
DOL _t (price)	0.0000 (0.9626)	0.0001 (0.8369)	-0.0001 (0.9642)	0.0006 (0.3087)	-0.0004 (0.7434)	-0.0008 (0.1088)
DOL _{t-1} (price)			0.0001 (0.9342)			
FIAS/OPRE _t	0.0065 ** (0.0457)	0.1112 *** (0.0000)	-0.0035 (0.5668)	0.1270 *** (0.0000)	-0.0030 (0.4263)	0.0472 *** (0.0000)
FIAS/OPRE _{t-1}			0.0002 (0.9676)			
INT/DEB _t	-0.0006 (0.8640)	0.0015 (0.4178)	0.0000 (0.9974)	0.0004 (0.8649)	-0.0002 (0.9618)	0.0003 (0.8522)
INT/DEB _{t-1}			-0.0009 (0.8382)			
DEB/OPRE _t	-0.0032 (0.7170)		0.0072 (0.5840)		0.0016 (0.8686)	
DEB/OPRE _{t-1}			-0.0074 (0.6340)			0.5249 *** (0.0000)
DEB/EBITDA _t	0.0003 (0.4775)		0.0000 (0.8923)		0.0000 (0.8915)	
DEB/EBITDA _{t-1}			0.0003 (0.2601)			
DEB/EQUITY _t	-0.0001 (0.8010)		0.0026 ** (0.0354)		0.0004 (0.4845)	
DEB/EQUITY _{t-1}			-0.0010 (0.3607)			
ROE _t	-0.0030 (0.1979)	0.0007 (0.5599)	-0.0014 (0.6419)	0.0002 (0.8811)	-0.0027 (0.2947)	0.0003 (0.7434)
ROE _{t-1}			0.0007 (0.7773)			
ROI _t		-0.0006 (0.7852)				0.0012 (0.5420)
ROI _{t-1}					0.0588 *** (0.0000)	
Adjusted ROI _t						
Adjusted ROI _{t-1}						
EBIT/INT _t	0.0000 (0.0673)	0.0000 (0.7006)	0.0000 (0.1993)	0.0000 (0.0548)	0.0000 (0.1209)	0.0000 (0.5063)
EBIT/INT _{t-1}			0.0000 (0.7504)			
ROS _t	0.2128 (0.0000)	-0.3949 *** (0.0000)	0.1677 *** (0.0001)	-0.7068 *** (0.0000)	0.1857 *** (0.0000)	-0.7152 *** (0.0000)
ROS _{t-1}			0.0242 (0.5888)			
TAX _t	0.0340 (0.1145)	-0.0197 (0.0691)	0.0299 (0.2754)	-0.0063 (0.6484)	0.0302 (0.2530)	-0.0247 ** (0.0222)
TAX _{t-1}			-0.0207 (0.4009)			
AV/STAF _t		0.0004 *** (0.0010)			0.0000 (0.8749)	
AV/STAF _{t-1}			-0.0001 (0.8291)			
AV/EMPL _t	-0.0001 (0.7567)					0.0002 (0.1550)
AV/EMPL _{t-1}						
RLFA _t	-0.0001 (0.1354)	-0.0002 *** (0.0000)	0.0000 (0.8993)		0.0000 (0.5147)	-0.0001 *** (0.0000)
RFLA _{t-1}			0.0000 (0.8550)			
R-squared	0.0019	0.1872	0.0017	0.1796	0.0056	0.4416
Adj. R-squared	0.0019	0.1871	0.0017	0.1795	0.0056	0.4414
p-value (F-stat)	0.0000	0.0000	0.0021	0.0000	0.0000	0.0000

GERMANY Variable	Semi-strong		Weak		Absence	
	ROI _t	DEB/OPRE _t	ROI _t	DEB/OPRE _t	ROI _t	DEB/OPRE _t
const	0.1176 *** (0.0000)	-0.1176 *** (0.0000)	0.1069 *** (0.0000)	-0.0998 *** (0.0000)	0.0819 *** (0.0000)	-0.0332 *** (0.0000)
CA/FIAS _t	0.0006 *** (0.0000)	0.0000 (0.1767)	-0.0001 (0.4666)	0.0000 (0.2936)	0.0001 (0.4077)	0.0000 (0.7302)
CA/FIAS _{t-1}			0.0000 (0.7236)			
CA/CL _t	0.0000 (0.5862)	0.0000 *** (0.0000)	0.0000 (0.7605)	0.0000 *** (0.0000)	0.0000 (0.6138)	0.0000 * (0.0283)
CA/CL _{t-1}				0.0000 *** (0.0000)		
WKCA/OPRE _t	-0.2229 ** (0.0017)	0.5730 *** (0.0000)			-0.2383 * (0.0157)	0.0879 *** (0.0000)
WKCA/OPRE _{t-1}			-0.1885 * (0.0313)	0.6539 *** (0.0000)		
WKCA/FIAS _t	-0.0004 (0.2896)	0.0000 (0.9817)	0.0008 (0.3157)	0.0001 (0.6565)	0.0003 (0.5199)	0.0000 (0.4209)
WKCA/FIAS _{t-1}			-0.0003 (0.6255)	0.0000 (0.9937)		
CRED-DEBD _t	0.0000 (0.9760)	-0.0001 (0.1792)	0.0000 (0.9699)	-0.0001 (0.4442)	0.0000 (0.9759)	0.0000 (0.4483)
CRED-DEBD _{t-1}			0.0000 (0.9675)	0.0000 (0.9258)		
DEBLT _t						
DEBLT _{t-1}						
FCFC/OPRE _t						
FCFC/OPRE _{t-1}						
FCFO/OPRE _t	-0.0078 (0.7702)	0.0174 * (0.0177)	-0.0094 (0.7883)	0.0952 *** (0.0000)	-0.0257 (0.5198)	-0.0130 * (0.0119)
FCFO/OPRE _{t-1}			0.0135 (0.6383)	0.0300 *** (0.0004)		
LEV _t	-0.0001 (0.9478)	0.0002 (0.3973)	0.0001 (0.9309)	-0.0001 (0.8121)	0.0002 (0.8312)	-0.0001 (0.3565)
LEV _{t-1}			-0.0007 (0.4485)	0.0003 (0.3024)		
DOL (volume)	0.0000 (0.7216)	0.0000 (0.2382)	0.0000 (0.8307)	0.0000 (0.4108)	0.0000 (0.8625)	0.0000 (0.8151)
DOL _{t-1} (volume)			0.0000 (0.9730)	0.0000 * (0.0321)		
DOL _t (price)	0.0027 *** (0.0000)	0.0001 (0.3959)	0.0039 *** (0.0000)	0.0002 (0.3067)	0.0024 *** (0.0001)	0.0002 * (0.0365)
DOL _{t-1} (price)			-0.0003 (0.6026)	0.0000 (0.8500)		
FIAS/OPRE _t	0.0067 (0.5708)	0.3431 *** (0.0000)	0.0072 (0.5362)	0.3268 *** (0.0000)	0.0119 (0.3378)	0.0659 *** (0.0000)
FIAS/OPRE _{t-1}						
INT/DEB _t	-0.0004 (0.1833)	0.0001 (0.1101)	-0.0001 (0.6735)	0.0001 (0.4169)	-0.0004 (0.1873)	0.0000 (0.7519)
INT/DEB _{t-1}			-0.0007 * (0.0294)	0.0001 (0.2593)		
DEB/OPRE _t	0.0084 (0.7098)				0.0104 (0.6638)	
DEB/OPRE _{t-1}			0.0064 (0.7853)			0.8634 *** (0.0000)
DEB/EBITDA _t	-0.0003 (0.4363)		-0.0003 (0.4357)		-0.0003 (0.4849)	
DEB/EBITDA _{t-1}			-0.0003 (0.3934)			
DEB/EQUITY _t	-0.0001 (0.4579)		-0.0001 (0.7401)		-0.0001 (0.5024)	
DEB/EQUITY _{t-1}			-0.0001 (0.8141)			
ROE _t	0.0170 *** (0.0000)	0.0009 (0.3421)	0.0115 ** (0.0052)	0.0001 (0.9436)	0.0143 *** (0.0002)	-0.0002 (0.6961)
ROE _{t-1}			0.0082 * (0.0375)			
ROK _t						
ROK _{t-1}					0.2160 *** (0.0000)	
Adjusted ROI _t		0.0007 (0.6343)		-0.0005 (0.7566)		-0.0002 (0.7909)
Adjusted ROI _{t-1}				-0.0005 (0.7591)		
EBIT/INT _t	0.0001 *** (0.0000)	0.0000 (0.0707)	0.0001 *** (0.0000)	0.0000 * (0.0327)	0.0001 *** (0.0000)	0.0000 (0.6109)
EBIT/INT _{t-1}			0.0000 ** (0.0015)			
ROS _t	1.1401 *** (0.0000)	-0.1654 *** (0.0000)	1.2935 *** (0.0000)	-0.1573 *** (0.0000)	1.0512 *** (0.0000)	0.0005 (0.9559)
ROS _{t-1}			-0.2316 * (0.0233)	-0.1465 *** (0.0000)		
TAX _t	0.0012 (0.8258)	-0.0016 (0.2806)	0.0001 (0.9768)	-0.0014 (0.3368)	0.0000 (0.9953)	-0.0002 (0.7394)
TAX _{t-1}			-0.0020 (0.6817)	-0.0009 (0.5241)		
AV/STAF _t		0.0003 *** (0.0000)	-0.0001 (0.7696)	0.0003 *** (0.0009)	-0.0002 (0.3086)	0.0000 (0.1252)
AV/STAF _{t-1}			-0.0002 (0.6065)	0.0000 (0.7509)		
AV/EMPL _t	-0.0002 (0.2690)					
AV/EMPL _{t-1}						
RLFA _t	0.0000 (0.6806)	0.0000 *** (0.0002)	0.0000 (0.8005)	0.0000 * (0.0158)	0.0000 (0.6870)	0.0000 (0.5143)
RFLA _{t-1}			0.0000 (0.9517)	0.0000 (0.0986)		
R-squared	0.0225	0.4871	0.0255	0.4785	0.0752	0.8900
Adj. R-squared	0.0224	0.4868	0.0254	0.4777	0.0752	0.8892
p-value (F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

IS BASEL THE RIGHT GATEWAY FOR A MORE EFFICIENT DEBT MARKET? AN INTERNATIONAL COMPARISON

SPAIN Variable	Semi-strong		Weak		Absence	
	ROIt	DEB/OPREt	ROIt	DEB/OPREt	ROIt	DEB/OPREt
const	0.0875 *** (0.0000)	0.0559 *** (0.0004)	0.0761 *** (0.0000)	-0.0051 (0.7569)	0.0425 *** (0.0000)	-0.0225 (0.0853)
CA/IAS _t			0.0004 *** (0.0000)	-0.0004 (0.3600)		
CA/IAS _{t-1}			0.0005 *** (0.0000)			
CA/CL _t	0.0000 (0.8428)	-0.0115 *** (0.0000)	0.0001 (0.5032)	-0.0088 *** (0.0000)	-0.0001 (0.6391)	-0.0064 *** (0.0000)
CA/CL _{t-1}			-0.0004 ** (0.0022)	-0.0051 *** (0.0000)		
WKCA/OPRE _t	0.0040 *** (0.0001)	0.3493 *** (0.0000)	0.0087 *** (0.0000)	0.3960 *** (0.0000)	0.0025 ** (0.0054)	0.2940 *** (0.0000)
WKCA/OPRE _{t-1}				-0.0231 *** (0.0003)		
WKCA/IAS _t	0.0002 (0.0585)	-0.0004 (0.4847)			0.0001 (0.3286)	-0.0006 (0.2637)
WKCA/IAS _{t-1}				0.0002 (0.7521)		
CRED-DEBD _t	0.0000 (0.5166)	0.0002 ** (0.0095)	0.0000 (0.2431)	0.0004 ** (0.0030)	0.0000 (0.5739)	0.0004 *** (0.0000)
CRED-DEBD _{t-1}			0.0000 (0.6512)	-0.0002 (0.1875)		
DEBL _t						
DEBL _{t-1}						
FCFC/OPRE _t						
FCFC/OPRE _{t-1}						
FCFO/OPRE _t			-0.0006 (0.4804)			
FCFO/OPRE _{t-1}						
LEV _t	-0.0003 * (0.0490)	0.0036 *** (0.0006)	-0.0003 (0.0924)	0.0023 * (0.0129)	-0.0002 (0.2118)	0.0011 (0.1931)
LEV _{t-1}			-0.0002 (0.2662)	0.0023 * (0.0218)		
DOL _t (volume)	0.0000 (0.4640)	0.0000 (0.9056)	0.0000 (0.5793)	0.0001 (0.4559)	0.0000 (0.6376)	0.0000 (0.8981)
DOL _{t-1} (volume)			0.0000 (0.9251)	-0.0001 (0.6311)		
DOL _t (price)	-0.0001 (0.6981)	-0.0018 (0.1702)	-0.0011 *** (0.0000)	-0.0004 (0.7749)	-0.0008 *** (0.0001)	-0.0017 (0.1238)
DOL _{t-1} (price)			0.0002 (0.3623)	0.0000 (0.9766)		
FIAS/OPRE _t	-0.0051 *** (0.0000)	0.2313 *** (0.0000)	-0.0056 *** (0.0000)	0.1361 *** (0.0000)	-0.0033 *** (0.0000)	0.1014 *** (0.0000)
FIAS/OPRE _{t-1}			-0.0001 (0.9240)	0.1245 *** (0.0000)		
INT/DEB _t	0.0003 (0.6237)	0.0015 (0.6934)	0.0005 (0.4836)	0.0006 (0.8830)	0.0003 (0.5918)	0.0005 (0.8861)
INT/DEB _{t-1}			0.0002 (0.7252)	0.0023 (0.4948)		
DEB/OPRE _t	-0.0031 ** (0.0059)		-0.0072 *** (0.0006)		-0.0010 (0.3360)	
DEB/OPRE _{t-1}			-0.0013 (0.5772)			0.5589 *** (0.0000)
DEB/EBITDA _t	-0.0001 * (0.0417)		0.0000 (0.8928)		0.0000 (0.4661)	
DEB/EBITDA _{t-1}			0.0000 (0.5322)			
DEB/EQUITY _t	-0.0019 *** (0.0000)		-0.0013 *** (0.0009)		-0.0010 ** (0.0013)	
DEB/EQUITY _{t-1}			-0.0009 * (0.0106)			
ROE _t	0.0564 *** (0.0000)	-0.0335 (0.0582)	0.0423 *** (0.0000)	-0.0427 ** (0.0066)	0.0379 *** (0.0000)	0.0006 (0.9635)
ROE _{t-1}			0.0366 *** (0.0000)	-0.0243 (0.1628)		
ROk _t		-0.0856 (0.2792)				
ROk _{t-1}				-0.1941 * (0.0150)	0.4561 *** (0.0000)	
Adjusted ROE _t		-0.0577 (0.3939)		-0.1295 *** (0.0009)		-0.0763 * (0.0166)
Adjusted ROE _{t-1}				0.0529 (0.3977)		
EBIT/INT _t	0.0000 ** (0.0060)	0.0000 (0.1367)	0.0000 (0.0529)	0.0000 (0.1441)	0.0000 (0.1413)	0.0000 (0.4777)
EBIT/INT _{t-1}			0.0000 (0.0877)	0.0000 (0.2912)		
ROS _t	0.3109 *** (0.0000)	-0.0840 (0.1464)	0.3551 *** (0.0000)	0.9181 *** (0.0000)	0.2146 *** (0.0000)	-0.0035 (0.9420)
ROS _{t-1}			0.0971 *** (0.0000)	-0.4507 *** (0.0000)		
TAX _t	0.0018 (0.1410)	-0.0023 (0.7552)	0.0019 (0.1493)	0.0233 ** (0.0010)	0.0006 (0.5904)	0.0019 (0.7585)
TAX _{t-1}			0.0023 (0.0821)	-0.0265 *** (0.0003)		
AV/STAF _t	0.0002 (0.5377)	0.0081 *** (0.0000)	0.0019 *** (0.0000)	-0.0087 *** (0.0002)	0.0004 (0.2013)	0.0016 (0.3063)
AV/STAF _{t-1}			-0.0023 *** (0.0000)	0.0199 *** (0.0000)		
AV/EMPL _t						
AV/EMPL _{t-1}						
RFA _t	0.0000 (0.6059)	-0.0001 *** (0.0000)	0.0000 (0.9838)	-0.0001 *** (0.0000)	0.0000 (0.7773)	0.0000 ** (0.0056)
RFA _{t-1}			0.0000 (0.8061)	-0.0001 *** (0.0000)		
R-squared	0.0831	0.4490	0.1303	0.5130	0.2689	0.6938
Adj. R-squared	0.0830	0.4486	0.1300	0.5119	0.2686	0.6931
p-value (F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

FRANCE Variable	Semi-strong		Weak		Absence	
	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}
const	0.1741 *** (0.0000)	0.1528 *** (0.0000)	0.1641 *** (0.0000)	0.0830 *** (0.0000)	0.1521 *** (0.0000)	0.3212 *** (0.0000)
CA/FASt _t	0.0000 (0.1765)	0.0000 (0.3932)	0.0000 (0.8675)	0.0000 (0.9457)	0.0000 (0.2080)	0.0000 (0.8730)
CA/FASt _{t-1}			0.0000 (0.6846)	-0.0002 *** (0.0001)		
CA/CL _t	0.0055 * (0.0470)	-0.0555 *** (0.0000)	0.0059 (0.1034)	-0.0546 *** (0.0000)	0.0040 (0.1323)	-0.0357 *** (0.0000)
CA/CL _{t-1}			0.0035 (0.3087)	-0.0243 *** (0.0000)		
WKCA/OPRE _t	0.1649 *** (0.0000)	6.5399 *** (0.0000)	0.0077 (0.8327)	1.3420 *** (0.0000)	0.0067 (0.8195)	1.5214 *** (0.0000)
WKCA/OPRE _{t-1}			-0.0284 (0.4894)	-0.3482 *** (0.0000)		
WKCA/FASt _t	0.0001 (0.1657)	-0.0002 * (0.0500)	0.0000 (0.7042)	-0.0002 *** (0.0032)	0.0001 (0.2073)	-0.0001 (0.1853)
WKCA/FASt _{t-1}			0.0001 (0.5541)	-0.0008 *** (0.0000)		
CRED-DEBD _t	0.0000 (0.7459)	0.0000 (0.5536)	0.0000 (0.6151)	0.0000 (0.5996)	0.0000 (0.8913)	0.0000 (0.6822)
CRED-DEBD _{t-1}			0.0000 (0.6754)	0.0000 (0.8607)		
DEBLT _t						
DEBLT _{t-1}						
FCFC/OPRE _t	0.1440 *** (0.0000)	5.2178 *** (0.0000)				
FCFC/OPRE _{t-1}						
FCFO/OPRE _t	-0.0193 (0.0874)	-2.6485 *** (0.0000)	0.0295 *** (0.0005)	-0.0262 *** (0.0000)	0.0273 *** (0.0006)	0.0511 *** (0.0000)
FCFO/OPRE _{t-1}						
LEV _t	0.0011 (0.7952)	-0.0078 (0.1547)	0.0005 (0.902)	0.0000 (0.9981)	0.0006 (0.8803)	-0.0042 (0.3414)
LEV _{t-1}			0.0022 (0.6008)	-0.0016 (0.5882)		
DOL _t (volume)	0.0000 (0.9611)	-0.0002 (0.1398)	0.0000 (0.9448)	-0.0001 (0.1733)	0.0000 (0.8965)	-0.0002 * (0.0448)
DOL _{t-1} (volume)			-0.0001 (0.2783)	-0.0001 (0.2668)		
DOL _t (price)	-0.0020 (0.2407)	-0.0083 *** (0.0003)	-0.0026 (0.1612)	-0.0019 (0.1380)	-0.0015 (0.3688)	-0.0126 *** (0.0000)
DOL _{t-1} (price)			0.0004 (0.8333)	-0.0015 (0.2686)		
FIAS/OPRE _t	0.0052 *** (0.0000)	-0.8748 *** (0.0000)	0.0014 (0.1813)	-1.0057 *** (0.0000)	0.0015 (0.1374)	-0.9810 *** (0.0000)
FIAS/OPRE _{t-1}			0.0008 (0.8941)	0.8208 *** (0.0000)		
INT/DEB _t	0.0031 (0.4429)	-0.0006 (0.9069)	0.0014 (0.7396)	0.0004 (0.9038)	0.0010 (0.8107)	0.0013 (0.7762)
INT/DEB _{t-1}			0.0051 (0.216)	0.0019 (0.5051)		
DEB/OPRE _t			0.0222 *** (0.0000)			
DEB/OPRE _{t-1}			-0.0304 ** (0.029)			-0.0083 *** (0.0000)
DEB/EBITDA _t	-0.0003 (0.3601)		-0.0004 (0.3466)		-0.0003 (0.3514)	
DEB/EBITDA _{t-1}			0.0000 (0.9688)			
DEB/EQUITY _t	-0.0022 (0.1687)		0.0001 (0.9661)		-0.0001 (0.9563)	
DEB/EQUITY _{t-1}			0.0008 (0.6208)			
ROE _t	0.0094 (0.0625)	-0.0008 (0.8991)	0.0160 *** (0.0022)	-0.0019 (0.6127)	0.0102 (0.0505)	0.0006 (0.9096)
ROE _{t-1}				-0.0069 (0.0491) **		
ROK _t		-0.0259 *** (0.0000)				-0.0094 (0.0554)
ROK _{t-1}					0.1267 *** (0.0000)	
Adjusted ROE _t				-0.0032 (0.3006)		
Adjusted ROE _{t-1}						
EBIT/INT _t	0.0000 * (0.0244)	0.0000 ** (0.0014)	0.0000 * (0.0865)	0.0000 (0.0777)	0.0000 (0.1056)	0.0000 * (0.0101)
EBIT/INT _{t-1}			0.0000 * (0.0881)	0.0000 (0.3304)		
ROS _t						
ROS _{t-1}			0.0650 *** (0.0003)	0.4402 <		
TAX _t	0.0076 (0.2417)	-0.0085 (0.3209)	0.0075 (0.2377)	-0.0078 (0.0846)	0.0069 (0.2816)	-0.0164 * (0.0168)
TAX _{t-1}			0.0116 * (0.0861)	-0.0093 (0.0507)		
AV/STAF _t	0.0005 (0.3627)	0.0011 (0.1507)	0.0005 (0.5016)	-0.0004 (0.4068)	0.0005 (0.3901)	0.0020 *** (0.0008)
AV/STAF _{t-1}			0.0000 (0.9525)	0.0009 (0.1104)		
AV/EMPL _t						
AV/EMPL _{t-1}						
RLFA _t	0.0000 (0.4960)	0.0004 *** (0.0000)	0.0000 (0.8202)	0.0002 <	0.0000 (0.7720)	0.0004 *** (0.0000)
RFLA _{t-1}			0.0000 (0.9852)	0.0000 (0.9922)		
R-squared	0.0015	0.9442	0.0023	0.9898	0.0195	0.9727
Adj. R-squared	0.0015	0.9439	0.0023	0.9890	0.0195	0.9723
p-value (F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

IS BASEL THE RIGHT GATEWAY FOR A MORE EFFICIENT DEBT MARKET? AN INTERNATIONAL COMPARISON

HUNGARY Variable	Semi-strong		Weak		Absence	
	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}
const	0.0954 *** (0.0000)	-0.0057 (0.4814)	0.0929 *** (0.0000)	0.0563 *** (0.0000)	0.0831 *** (0.0000)	-0.0058 (0.4081)
CA/FIAS _{it}	0.0010 (0.0574)	-0.0028 *** (0.0000)			0.0006 (0.2942)	-0.0020 *** (0.0002)
CA/FIAS _{it-1}			-0.0025 ** (0.0047)	-0.0015 (0.0578)		
CA/CL _{it}	0.0033 (0.1090)	-0.0086 *** (0.0000)	0.0078 (0.1353)	-0.0139 ** (0.0034)	0.0026 (0.4185)	-0.0003 (0.8511)
CA/CL _{it-1}			-0.0044 (0.4444)	-0.0264 *** (0.0000)		
WKCA/OPRE _{it}	-0.0901 * (0.0254)	0.3261 *** (0.0000)			-0.0940 * (0.0424)	0.1173 *** (0.0002)
WKCA/OPRE _{it-1}						
WKCA/FIAS _{it}	0.0041 * (0.0140)	0.0063 *** (0.0000)	0.0029 (0.3188)	0.0014 (0.5892)	0.0015 (0.4117)	0.0041 ** (0.0073)
WKCA/FIAS _{it-1}			0.0073 * (0.0457)	0.0064 (0.0522)		
CRED-DEBD _{it}	-0.0005 (0.0660)	0.0042 *** (0.0000)	-0.0022 *** (0.0009)	0.0000 (0.9877)	-0.0031 *** (0.0000)	0.0040 *** (0.0000)
CRED-DEBD _{it-1}						
DEBL _{it}						
DEBL _{it-1}						
FCFC/OPRE _{it}						
FCFC/OPRE _{it-1}						
FCFO/OPRE _{it}	-0.0156 (0.3127)	0.1649 *** (0.0000)	0.0068 (0.6346)	-0.0659 *** (0.0000)	-0.0264 (0.1773)	0.0410 ** (0.0024)
FCFO/OPRE _{it-1}			0.0195 (0.1239)	0.0972 *** (0.0000)		
LEV _{it}	-0.0002 (0.8347)	0.0009 (0.2718)	-0.0003 (0.7821)	0.0011 (0.2176)	-0.0001 (0.8812)	0.0005 (0.4981)
LEV _{it-1}			-0.0006 (0.5502)	0.0015 (0.0963)		
DOLE _{it} (volume)	-0.0001 (0.3458)	-0.0001 (0.1617)	-0.0001 (0.5476)	-0.0002 * (0.0300)	-0.0001 (0.3502)	-0.0001 (0.5245)
DOLE _{it-1} (volume)			-0.0001 (0.5878)	-0.0002 (0.0864)		
DOLE _{it} (price)	-0.0003 (0.5577)	0.0009 * (0.0241)	-0.0002 (0.7537)	0.0019 *** (0.0009)	0.0000 (0.9596)	0.0005 (0.1069)
DOLE _{it-1} (price)			0.0000 (0.9978)	0.0002 (0.5349)		
FIAS/OPRE _{it}	0.0074 (0.1372)	0.1788 *** (0.0000)	-0.0148 (0.0622)	0.2807 *** (0.0000)	0.0083 (0.0822)	0.0847 *** (0.0000)
FIAS/OPRE _{it-1}						
INT/DEB _{it}	-0.0001 (0.8644)	0.0013 * (0.0227)	-0.0001 (0.8580)	0.0005 (0.3595)	-0.0002 (0.7128)	0.0005 (0.2663)
INT/DEB _{it-1}			0.0000 (0.9878)	0.0008 (0.2262)		
DEB/OPRE _{it}	-0.0241 (0.0786)		0.0077 (0.7510)		-0.0199 (0.1532)	
DEB/OPRE _{it-1}			-0.0165 (0.5226)			0.5495 *** (0.0000)
DEB/EBITDA _{it}	0.0001 (0.8395)		0.0001 (0.8021)		0.0001 (0.7693)	
DEB/EBITDA _{it-1}			-0.0001 (0.8263)			
DEB/EQUITY _{it}	-0.0030 (0.1212)		-0.0127 *** (0.0003)		-0.0024 (0.1998)	
DEB/EQUITY _{it-1}			0.0003 (0.9344)			
ROE _{it}	0.0812 *** (0.0000)	0.0010 (0.8347)	0.0775 *** (0.0000)	0.0007 (0.8924)	0.0729 *** (0.0000)	0.0046 (0.2494)
ROE _{it-1}			0.0085 (0.2192)	0.0040 (0.5192)		
ROK _{it}		-0.0050 (0.7473)		-0.0041 (0.8079)		-0.0054 (0.6894)
ROK _{it-1}				0.0233 (0.1843)	0.0907 *** (0.0000)	
Adjusted ROE _{it}		-0.0131 (0.3329)		-0.0224 (0.1852)		-0.0139 (0.2820)
Adjusted ROE _{it-1}				-0.0305 * (0.0461)		
EBIT/INT _{it}	0.0001 *** (0.0000)	0.0000 * (0.0178)	0.0001 *** (0.0000)	0.0000 (0.2743)	0.0001 *** (0.0000)	0.0000 (0.2436)
EBIT/INT _{it-1}			0.0000 * (0.0332)	0.0000 (0.6610)		
ROS _{it}	0.5612 *** (0.0000)	0.0213 (0.5544)	0.4360 *** (0.0000)	0.1299 ** (0.0016)	0.4693 *** (0.0000)	-0.0138 (0.6671)
ROS _{it-1}			0.1625 * (0.0100)	-0.3942 *** (0.0000)		
TAX _{it}	0.0047 (0.6217)	-0.0067 (0.3862)	0.0059 (0.5892)	0.0017 (0.8666)	0.0061 (0.5804)	-0.0081 (0.1850)
TAX _{it-1}			0.0021 (0.7979)	0.0035 (0.6292)		
AV/STAF _{it}	-0.0001 (0.2356)	0.0014 *** (0.0000)	-0.0001 (0.8458)	0.0001 (0.7928)	-0.0001 (0.5556)	0.0006 *** (0.0000)
AV/STAF _{it-1}			-0.0001 (0.6232)	0.0019 *** (0.0000)		
AV/EMPL _{it}						
AV/EMPL _{it-1}						
RFA _{it}	-0.0003 (0.1581)	0.0019 *** (0.0000)			-0.0004 (0.1021)	0.0003 (0.1173)
RFA _{it-1}			0.0001 (0.7548)	-0.0012 *** (0.0000)		
R-squared	0.0541	0.3924	0.0878	0.3922	0.0768	0.6300
Adj. R-squared	0.0540	0.3915	0.0873	0.3900	0.0765	0.6283
p-value (F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

ITALY Variable	Semi-strong		Weak		Absence	
	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}
const	0.1088 *** (0.0000)	0.2057 *** (0.0000)	0.0964 *** (0.0000)	0.2389 *** (0.0000)	0.0699 *** (0.0000)	0.0629 *** (0.0000)
CA/FIAS _{it}	0.0000 (0.1692)	0.0001 ** (0.0014)	0.0000 (0.8449)	0.0002 *** (0.0000)	0.0000 (0.1810)	0.0001 ** (0.0097)
CA/FIAS _{it-1}			0.0002 *** (0.0000)	0.0001 * (0.0216)		
CA/CL _{it}	0.0146 *** (0.0000)	-0.0965 *** (0.0000)	0.0134 *** (0.0000)	-0.0682 *** (0.0000)	0.0110 *** (0.0000)	-0.0367 *** (0.0000)
CA/CL _{it-1}			0.0016 (0.4936)	-0.0590 *** (0.0000)		
WKCA/OPRE _{it}						
WKCA/OPRE _{it-1}						
WKCA/FIAS _{it}	0.0000 (0.6345)	-0.0004 *** (0.0000)	-0.0002 (0.2886)	-0.0009 *** (0.0000)	0.0001 (0.5589)	-0.0006 *** (0.0000)
WKCA/FIAS _{it-1}						
CRED-DEBD _{it}	0.0000 (0.8822)	0.0003 *** (0.0000)	0.0000 (0.5022)	0.0004 *** (0.0000)	0.0000 (0.8191)	0.0002 *** (0.0000)
CRED-DEBD _{it-1}			0.0000 (0.7545)	0.0000 (0.2003)		
DEBLT _{it}						
DEBLT _{it-1}						
FCFC/OPRE _{it}						
FCFC/OPRE _{it-1}						
FCFO/OPRE _{it}	0.0099 *** (0.0000)	-0.1803 *** (0.0000)	0.0110 *** (0.0000)	-0.1832 *** (0.0000)	0.0084 *** (0.0000)	-0.1005 *** (0.0000)
FCFO/OPRE _{it-1}			0.0012 (0.6684)	-0.0031 (0.2533)		
LEV _{it}	-0.0002 (0.5683)	0.0004 (0.1764)	-0.0001 (0.7472)	0.0002 (0.5102)	-0.0001 (0.7916)	-0.0001 (0.5925)
LEV _{it-1}			0.0000 (0.9063)	0.0001 (0.8273)		
DOL (volume)	-0.0001 * (0.0287)	0.0001 (0.1093)	-0.0001 (0.0699)	0.0000 (0.5041)	-0.0001 (0.1569)	0.0000 (0.5490)
DOL _{it-1} (volume)			-0.0001 (0.1136)	0.0001 * (0.0259)		
DOL (price)	-0.0010 *** (0.0001)	-0.0012 *** (0.0000)	-0.0007 ** (0.0047)	-0.0008 ** (0.0022)	-0.0006 * (0.0124)	-0.0002 (0.1579)
DOL _{it-1} (price)			-0.0005 (0.1015)	-0.0008 ** (0.0066)		
FIAS/OPRE _{it}	0.0078 *** (0.0000)	0.1815 *** (0.0000)	0.0201 *** (0.0000)	0.1051 *** (0.0000)	0.0079 *** (0.0000)	0.0505 *** (0.0000)
FIAS/OPRE _{it-1}			-0.0117 *** (0.0000)	0.0942 *** (0.0000)		
INT/DEB _{it}	0.0005 (0.0883)	0.0027 *** (0.0000)	0.0005 (0.1303)	0.0022 *** (0.0000)	0.0005 (0.1030)	0.0012 *** (0.0000)
INT/DEB _{it-1}			0.0001 (0.8071)	0.0013 *** (0.0002)		
DEB/OPRE _{it}	-0.0153 *** (0.0000)		0.0194 *** (0.0006)		-0.0078 * (0.0295)	
DEB/OPRE _{it-1}			-0.0402 *** (0.0000)			0.7427 *** (0.0000)
DEB/EBITDA _{it}	-0.0003 * (0.0152)		-0.0002 (0.0960)		-0.0002 (0.0546)	
DEB/EBITDA _{it-1}			-0.0002 (0.0999)			
DEB/EQUITY _{it}	-0.0009 *** (0.0001)		-0.0004 (0.1312)		-0.0007 ** (0.0023)	
DEB/EQUITY _{it-1}			-0.0012 *** (0.0000)			
ROE _{it}	0.0234 *** (0.0000)	-0.0104 *** (0.0000)	0.0213 *** (0.0000)	-0.0122 *** (0.0000)	0.0194 *** (0.0000)	-0.0023 (0.1070)
ROE _{it-1}			0.0134 *** (0.0000)	-0.0111 *** (0.0000)		
RO _{it}		-0.0209 *** (0.0010)		-0.0078 (0.2915)		0.0250 *** (0.0000)
RO _{it-1}				-0.0368 *** (0.0000)	0.2177 *** (0.0000)	
Adjusted RO _{it}		0.0043 (0.3661)		0.0005 (0.9316)		-0.0099 * (0.0120)
Adjusted RO _{it-1}				0.0117 * (0.0331)		
EBIT/INT _{it}	0.0000 *** (0.0000)	0.0000 *** (0.0000)	0.0000 *** (0.0000)	0.0000 * (0.0287)	0.0000 *** (0.0000)	0.0000 (0.3304)
EBIT/INT _{it-1}			0.0000 *** (0.0004)	0.0000 * (0.0499)		
ROS _{it}	0.4648 *** (0.0000)	-0.0699 *** (0.0000)	0.4721 *** (0.0000)	-0.3479 *** (0.0000)	0.3886 *** (0.0000)	-0.4956 *** (0.0000)
ROS _{it-1}			0.0759 *** (0.0001)	0.4309 *** (0.0000)		
TAX _{it}	0.0052 ** (0.0077)	-0.0074 *** (0.0001)	0.0047 * (0.0220)	-0.0042 * (0.0384)	0.0039 (0.0535)	-0.0009 (0.5540)
TAX _{it-1}			0.0046 * (0.0223)	-0.0082 *** (0.0000)		
AV/STAF _{it}	0.0000 (0.9483)	0.0002 (0.1021)	0.0001 (0.6794)	0.0000 (0.8571)	0.0000 (0.9435)	-0.0001 (0.4734)
AV/STAF _{it-1}			-0.0002 (0.4530)	0.0001 (0.5078)		
AV/EMPL _{it}						
AV/EMPL _{it-1}						
RFA _{it}	-0.0003 *** (0.0000)	0.0004 *** (0.0000)	-0.0002 * (0.0207)	0.0003 *** (0.0003)	-0.0002 *** (0.0002)	0.0001 * (0.0125)
RFA _{it-1}			-0.0002 (0.0649)	-0.0001 (0.1098)		
R-squared	0.0214	0.3750	0.0275	0.3897	0.0744	0.7054
Adj. R-squared	0.0214	0.3749	0.0275	0.3895	0.0744	0.7052
p-value (F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

IS BASEL THE RIGHT GATEWAY FOR A MORE EFFICIENT DEBT MARKET? AN INTERNATIONAL COMPARISON

POLAND Variable	Semi-strong		Weak		Absence	
	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}
const	0.1030 *** (0.0000)	0.0131 (0.3601)	0.0763 *** (0.0003)	0.0442 *** (0.0023)	0.0583 ** (0.0034)	-0.0423 *** (0.0000)
CA/FIAS _t	0.0031 *** (0.0000)	-0.0005 (0.0885)			0.0006 (0.1279)	-0.0020 *** (0.0000)
CA/FIAS _{t-1}			-0.0007 (0.4559)	0.0001 (0.8775)		
CA/CL _t	-0.0045 (0.2880)	-0.0784 *** (0.0000)	0.0091 (0.2548)	-0.1053 *** (0.0000)	0.0113 * (0.0159)	0.0134 *** (0.0000)
CA/CL _{t-1}			0.0035 (0.6239)	0.0294 *** (0.0000)		
WKCA/OPRE _t	-0.1629 * (0.0118)	0.2927 *** (0.0000)			-0.1658 ** (0.0057)	
WKCA/OPRE _{t-1}						
WKCA/FIAS _t	-0.0033 ** (0.0042)	0.0015 (0.0640)	0.0013 (0.1415)	0.0000 (0.9644)	0.0004 (0.7214)	0.0034 *** (0.0000)
WKCA/FIAS _{t-1}			0.0015 (0.4791)	0.0014 (0.3452)		
CRED-DEBD _t	-0.0111 *** (0.0000)	-0.0026 ** (0.0026)	-0.0056 ** (0.0234)	-0.0034 ** (0.0449)	-0.0014 (0.2642)	-0.0022 *** (0.0000)
CRED-DEBD _{t-1}			0.0033 (0.2242)	0.0031 (0.0948)		
DEBL _t						
DEBL _{t-1}						
FCFC/OPRE _t			0.0396 (0.3940)	0.1172 *** (0.0002)		0.0632 *** (0.0000)
FCFC/OPRE _{t-1}						
FCFO/OPRE _t	-0.0436 * (0.0289)	0.1305 *** (0.0000)	0.0066 (0.8276)	-0.0203 (0.3228)	-0.0310 (0.0834)	-0.0136 (0.1277)
FCFO/OPRE _{t-1}			0.0051 (0.8225)	-0.1165 *** (0.0000)		
LEV _t	-0.0003 (0.8955)	0.0033 * (0.0202)	-0.0005 (0.7521)	0.0045 *** (0.0000)	-0.0003 (0.8819)	0.0020 ** (0.0017)
LEV _{t-1}			-0.0005 (0.7960)	-0.0010 (0.4259)		
DOL _t (volume)	0.0000 (0.9954)	-0.0001 (0.6119)	0.0000 (0.9534)	-0.0001 (0.4596)	0.0000 (0.9864)	0.0000 (0.7792)
DOL _{t-1} (volume)			0.0000 (0.9778)	-0.0002 (0.1600)		
DOL _t (price)	0.0001 (0.9685)	0.0012 (0.1723)	0.0003 (0.8238)	0.0001 (0.8819)	0.0004 (0.7173)	0.0010 * (0.0219)
DOL _{t-1} (price)			0.0018 (0.1316)	0.0005 (0.5246)		
FIAS/OPRE _t	-0.0363 *** (0.0001)	0.1498 *** (0.0000)			-0.0274 ** (0.0019)	0.0480 *** (0.0000)
FIAS/OPRE _{t-1}			-0.0436 *** (0.0000)	0.1751 *** (0.0000)		
INT/DEB _t	0.0011 (0.6905)	0.0056 ** (0.0030)	0.0009 (0.7848)	0.0038 (0.1096)	0.0010 (0.6759)	0.0022 * (0.0422)
INT/DEB _{t-1}			-0.0004 (0.9142)	0.0053 ** (0.0252)		
DEB/OPRE _t	-0.0599 ** (0.0044)		0.0228 (0.3936)		-0.0077 (0.7528)	
DEB/OPRE _{t-1}						0.7182 *** (0.0000)
DEB/EBITDA _t	0.0004 (0.6231)		-0.0001 (0.8486)		0.0002 (0.7342)	
DEB/EBITDA _{t-1}			0.0006 (0.4955)			
DEB/EQUITY _t	-0.0034 (0.3796)		0.0002 (0.9493)		0.0006 (0.8611)	
DEB/EQUITY _{t-1}			0.0004 (0.9106)			
ROE _t	0.0188 * (0.0112)	-0.0029 (0.5733)	0.0133 ** (0.0269)	0.0026 (0.5151)	0.0157 * (0.0143)	-0.0001 (0.9676)
ROE _{t-1}			0.0244 *** (0.0002)	-0.0070 (0.1091)		
ROK _t		-0.0288 ** (0.0040)		0.0124 (0.3123)		-0.0215 *** (0.0001)
ROK _{t-1}					0.2414 *** (0.0000)	
Adjusted ROE _t						
Adjusted ROE _{t-1}				-0.0194 (0.1132)		
EBIT/INT _t	0.0000 *** (0.0004)	0.0000 *** (0.0003)	0.0000 *** (0.0009)	0.0000 (0.6198)	0.0000 *** (0.0006)	0.0000 ** (0.0054)
EBIT/INT _{t-1}			0.0000 (0.3564)	0.0000 *** (0.0014)		
ROS _t	1.5770 *** (0.0000)	1.0061 *** (0.0000)	1.2525 *** (0.0000)	-0.1831 (0.0883)	1.1300 *** (0.0000)	-0.0257 (0.5718)
ROS _{t-1}			-0.0883 (0.5672)	0.9509 *** (0.0000)		
TAX _t	-0.0004 (0.9753)	-0.0170 (0.0804)	-0.0029 (0.8277)	-0.0046 (0.6027)	-0.0006 (0.9611)	-0.0090 * (0.0386)
TAX _{t-1}			-0.0046 (0.7238)	-0.0029 (0.7414)		
AV/STAF _t	0.0117 *** (0.0002)	0.0017 (0.4308)	0.0026 (0.5010)	-0.0130 *** (0.0000)	0.0004 (0.8973)	0.0055 *** (0.0000)
AV/STAF _{t-1}			-0.0046 (0.2264)	0.0071 *** (0.0071)		
AV/EMPL _t						
AV/EMPL _{t-1}						
RFA _t	0.0000 (0.5739)	-0.0001 *** (0.0000)	0.0000 (0.2720)	-0.0001 *** (0.0000)	0.0000 (0.7099)	0.0000 (0.4678)
RFA _{t-1}						
R-squared	0.0784	0.2989	0.0630	0.4116	0.1715	0.8187
Adj. R-squared	0.0781	0.2977	0.0623	0.4073	0.1705	0.8142
p-value (F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

SLOVAKIA Variable	Semi-strong		Weak		Absence	
	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}
const	0.1598 *** (0.0000)	0.1177 (0.1122)	0.0823 (0.1026)	0.0028 (0.9720)	0.1413 *** (0.0014)	-0.0512 (0.3720)
CA/FIAS _t	0.0017 ** (0.0339)	-0.0003 (0.8268)	0.0022 (0.2438)	0.0036 (0.2082)	0.0029 ** (0.0461)	0.0003 (0.8754)
CA/FIAS _{t-1}			0.0057 ** (0.0392)	-0.0013 (0.7624)		
CA/CL _t	0.0073 (0.3192)	-0.0440 *** (0.0017)	0.0000 (0.9963)	-0.0158 (0.2196)	0.0020 (0.8027)	-0.0107 (0.2972)
CA/CL _{t-1}			-0.0005 (0.9483)	-0.1048 *** (0.0000)		
WKCA/OPRE _t			0.0024 (0.3512)			
WKCA/OPRE _{t-1}			-0.0103 (0.6880)			
WKCA/FIAS _t	-0.0011 (0.4922)	-0.0015 (0.6202)		0.0013 (0.7414)	-0.0024 (0.2892)	-0.0013 (0.6628)
WKCA/FIAS _{t-1}			-0.0189 *** (0.0020)	-0.0157 (0.1006)		
CRED-DEBD _t	0.0068 *** (0.0084)	-0.0032 (0.5162)	0.0035 (0.5661)	0.0546 *** (0.0000)	0.0071 ** (0.0172)	0.0018 (0.6314)
CRED-DEBD _{t-1}			-0.0046 (0.4530)	-0.0418 *** (0.0000)		
DEBLT _t						
DEBLT _{t-1}						
FCFC/OPRE _t	-0.0018 (0.8178)	-0.4535 *** (0.0000)			0.0018 (0.8653)	0.4056 *** (0.0000)
FCFC/OPRE _{t-1}				0.1431 *** (0.0000)		
FCFO/OPRE _t			-0.0029 (0.7599)	-0.5564 *** (0.0000)		-0.6049 *** (0.0000)
FCFO/OPRE _{t-1}				-0.0714 *** (0.0002)		
LEV _t	-0.0005 (0.9221)	-0.0024 (0.8028)	-0.0003 (0.9615)	-0.0033 (0.6881)	-0.0005 (0.9314)	-0.0007 (0.9173)
LEV _{t-1}			-0.0002 (0.9765)	0.0004 (0.9601)		
DOL _t (volume)	-0.0001 (0.8416)	-0.0004 (0.7317)	-0.0001 (0.9312)	-0.0001 (0.8954)	-0.0001 (0.8823)	-0.0002 (0.8302)
DOL _{t-1} (volume)			0.0001 (0.9016)	-0.0004 (0.7367)		
DOL _t (price)	-0.0077 *** (0.0004)	-0.0011 (0.7857)	-0.0124 *** (0.0000)	0.0007 (0.8783)	-0.0083 *** (0.0005)	0.0004 (0.9053)
DOL _{t-1} (price)			0.0140 *** (0.0000)	0.0008 (0.8638)		
FIAS/OPRE _t					0.0036 (0.4313)	0.1086 *** (0.0000)
FIAS/OPRE _{t-1}			0.0015 (0.8046)	0.1013 *** (0.0000)		
INT/DEB _t	0.0027 (0.7186)	0.0075 (0.5969)	-0.0002 (0.9808)	0.0041 (0.7802)	0.0031 (0.7134)	0.0009 (0.9326)
INT/DEB _{t-1}			0.0096 (0.4460)	0.0056 (0.7740)		
DEB/OPRE _t	-0.0002 (0.9721)		-0.0015 (0.8875)		-0.0017 (0.8299)	
DEB/OPRE _{t-1}			-0.0010 (0.9117)			0.3987 *** (0.0000)
DEB/EBITDA _t	-0.0003 (0.6197)		-0.0001 (0.8894)		-0.0003 (0.6475)	
DEB/EBITDA _{t-1}			0.0000 (0.9943)			
DEB/EQUITY _t	-0.0010 (0.6484)		0.0000 (0.9883)		-0.0004 (0.8769)	
DEB/EQUITY _{t-1}			0.0006 (0.8060)			
ROE _t	0.0167 (0.1984)	-0.0119 (0.6348)	0.0222 (0.2434)	-0.0104 (0.7273)	0.0264 (0.1449)	-0.0112 (0.6315)
ROE _{t-1}			0.0008 (0.9577)	-0.0048 (0.8435)		
ROK _t				-0.0098 (0.8425)		
ROK _{t-1}				-0.0158 (0.7578)	0.0581 *** (0.0000)	
Adjusted ROE _t		-0.0008 (0.9678)		0.0048 (0.9020)		-0.0022 (0.8771)
Adjusted ROE _{t-1}				0.0073 (0.8585)		
EBIT/INT _t	0.0003 *** (0.0067)	0.0000 (0.9798)	-0.0001 (0.3767)	0.0000 (0.9850)	0.0002 ** (0.0435)	-0.0001 (0.6427)
EBIT/INT _{t-1}			0.0018 *** (0.0000)	-0.0002 (0.6390)		
ROS _t	0.0219 (0.3107)	0.4307 *** (0.0000)	0.0820 (0.1591)	0.2538 *** (0.0056)	0.1196 * (0.0621)	0.7752 *** (0.0000)
ROS _{t-1}			0.0207 (0.7770)	0.0865 (0.4320)		
TAX _t	0.0149 (0.7031)	-0.0155 (0.8369)	0.0108 (0.8126)	0.0368 (0.6051)	0.0112 (0.8045)	-0.0063 (0.9151)
TAX _{t-1}			0.0088 (0.8391)	-0.0164 (0.8083)		
AV/STAF _t	0.0008 (0.7048)	-0.0152 *** (0.0002)	0.0030 (0.5282)	0.0118 (0.1135)	0.0009 (0.7215)	0.0060 * (0.0770)
AV/STAF _{t-1}			-0.0014 (0.7483)	0.0476 *** (0.0000)		
AV/EMPL _t						
AV/EMPL _{t-1}						
RLFA _t	-0.0001 (0.5375)	0.0100 *** (0.0000)			-0.0003 (0.3281)	0.0020 *** (0.0000)
RFLA _{t-1}			0.0000 (0.9206)	0.0033 *** (0.0000)		
R-squared	0.0061	0.3291	0.0226	0.5814	0.0105	0.6976
Adj. R-squared	0.0061	0.3282	0.0224	0.5771	0.0104	0.6948
p-value (F-stat)	0.0051	0.0000	0.0000	0.0000	0.0001	0.0000

IS BASEL THE RIGHT GATEWAY FOR A MORE EFFICIENT DEBT MARKET? AN INTERNATIONAL COMPARISON

UK Variable	Semi-strong		Weak		Absence	
	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}
const	0.1477 *** (0.0000)	0.0853 *** (0.0000)	0.1843 *** (0.0000)	0.0886 *** (0.0001)	0.1754 *** (0.0000)	-0.0580 *** (0.0000)
CA/FIAS _t	0.0001 (0.3028)	0.0001 (0.1351)	0.0001 (0.2838)	0.0000 (0.6350)	-0.0001 (0.6238)	0.0000 (0.4153)
CA/FIAS _{t-1}			0.0002 ** (0.0652)	0.0001 (0.3303)		
CA/CL _t	0.0059 ** (0.0887)	0.0249 *** (0.0000)	0.0000 (0.9998)	0.0179 *** (0.0000)	0.0067 * (0.0680)	0.0076 *** (0.0000)
CA/CL _{t-1}			0.0063 (0.2442)	0.0241 *** (0.0000)		
WKCA/OPRE _t	-0.1195 (0.3136)	-1.1915 *** (0.0000)		-1.0739 *** (0.0000)	-0.1638 (0.2123)	-0.2010 *** (0.0001)
WKCA/OPRE _{t-1}			-0.1930 (0.1193)			
WKCA/FIAS _t	-0.0002 (0.4392)	-0.0002 (0.2754)	-0.0003 (0.1696)	-0.0001 (0.4768)	0.0001 (0.5710)	0.0000 (0.6068)
WKCA/FIAS _{t-1}						
CRED-DEBD _t						
CRED-DEBD _{t-1}						
DEBL _t						
DEBL _{t-1}						
FCFC/OPRE _t						
FCFC/OPRE _{t-1}						
FCFO/OPRE _t	0.0096 (0.7500)	-0.7371 *** (0.0000)	0.0377 (0.1975)	-0.4201 *** (0.0000)	0.0002 (0.9944)	-0.1954 *** (0.0000)
FCFO/OPRE _{t-1}			-0.0364 (0.2671)	-0.1577 *** (0.0000)		
LEV _t	-0.0002 (0.8772)	-0.0002 (0.8681)	0.0000 (0.9830)	-0.0001 (0.9134)	-0.0002 (0.9298)	-0.0001 (0.8382)
LEV _{t-1}			-0.0002 (0.8955)	-0.0001 (0.9140)		
DOLE _t (volume)	0.0000 (0.8506)	0.0000 (0.9194)	-0.0001 (0.7708)	-0.0001 (0.6865)	-0.0001 (0.8043)	0.0001 (0.3227)
DOLE _{t-1} (volume)			-0.0001 (0.6647)	0.0000 (0.9774)		
DOLE _t (price)	-0.0009 (0.5650)	-0.0016 (0.1329)	-0.0003 (0.8240)	-0.0016 (0.1622)	-0.0011 (0.5297)	0.0003 (0.5821)
DOLE _{t-1} (price)			-0.0013 (0.4318)	-0.0020 (0.1352)		
FIAS/OPRE _t	0.0029 (0.7963)	0.7522 *** (0.0000)		0.7659 *** (0.0000)	0.0027 (0.8360)	0.2975 *** (0.0000)
FIAS/OPRE _{t-1}			-0.0299 *** (0.0063)			
INT/DEB _t	0.0003 (0.9883)	0.0027 (0.8216)	0.0025 (0.8699)	0.0015 (0.9037)	-0.0012 (0.9508)	-0.0005 (0.9466)
INT/DEB _{t-1}			-0.0005 (0.9730)	0.0016 (0.8978)		
DEB/OPRE _t	-0.0049 (0.5835)		0.0210 ** (0.0113)		-0.0131 (0.2134)	
DEB/OPRE _{t-1}						0.7069 *** (0.0000)
DEB/EBITDA _t	0.0000 (0.9261)		0.0000 (0.8824)		0.0000 (0.9897)	
DEB/EBITDA _{t-1}			-0.0001 (0.6267)			
DEB/EQUITY _t	0.0000 (0.7863)		-0.0001 (0.7467)		0.0000 (0.7942)	
DEB/EQUITY _{t-1}			-0.0001 (0.8276)			
ROE _t	0.0000 (0.9996)	0.0000 (0.9609)	0.0000 (0.9634)	0.0000 (0.9371)	0.0000 (0.9794)	0.0000 (0.9257)
ROE _{t-1}			0.0000 (0.9881)	0.0000 (0.8654)		
ROK _t				0.0158 ** (0.0112)		
ROK _{t-1}					-0.0166 *** (0.0083)	
Adjusted ROE _t		-0.0008 (0.8264)				0.0005 (0.8255)
Adjusted ROE _{t-1}				0.0050 (0.3008)		
EBIT/INT _t	0.0000 (0.2861)	0.0000 (0.5170)	0.0000 (0.9172)	0.0000 (0.3736)	0.0000 (0.2694)	0.0000 (0.8095)
EBIT/INT _{t-1}			0.0000 * (0.0559)	0.0000 (0.6104)		
ROS _t	0.8785 *** (0.0000)	-1.5983 *** (0.0000)	0.5942 *** (0.0000)	-1.5441 *** (0.0000)	0.6367 *** (0.0000)	-0.2393 *** (0.0000)
ROS _{t-1}			0.2273 *** (0.0002)	-1.2689 *** (0.0000)		
TAX _t	0.0020 (0.8099)	0.0030 (0.6102)	0.0021 (0.7856)	0.0046 (0.4726)	0.0020 (0.8276)	0.0071 ** (0.0423)
TAX _{t-1}			-0.0018 (0.8105)	0.0007 (0.9162)		
AV/STAF _t	-0.0011 (0.7988)	0.0119 *** (0.0001)	0.0077 (0.1887)	0.0092 * (0.0621)	0.0021 (0.6676)	-0.0091 *** (0.0000)
AV/STAF _{t-1}			-0.0080 (0.2216)	0.0141 ** (0.0106)		
AV/EMPL _t						
AV/EMPL _{t-1}						
RLEA _t	0.0000 (0.4675)	0.0000 ** (0.0299)	0.0000 (0.9009)	0.0000 (0.1278)	0.0000 (0.5722)	0.0000 *** (0.0002)
RLEA _{t-1}			0.0000 (0.8203)	0.0000 ** (0.0460)		
R-squared	0.0095	0.4851	0.0094	0.5099	0.0059	0.8463
Adj. R-squared	0.0095	0.4848	0.0094	0.5090	0.0059	0.8455
p-value (F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

USA Variable	Semi-strong		Weak		Absence	
	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}	RO _{it}	DEB/OPRE _{it}
const	-0.3303 (0.1919)	3.4726 *** (0.0000)	-0.1234 (0.1536)	3.6704 *** (0.0000)	-0.1844 * (0.0931)	2.8898 *** (0.0000)
CA/IAS _{it}	-0.2848 *** (0.0000)	0.0057 (0.9188)	-0.2180 *** (0.0000)	0.0047 (0.9495)	-0.1593 *** (0.0000)	-0.0791 (0.1150)
CA/IAS _{it-1}			0.0151 (0.6920)			
CA/CL _{it}	0.1007 (0.1966)	-1.0265 *** (0.0000)	0.1125 *** (0.0029)	-1.2015 *** (0.0000)	0.0852 ** (0.0118)	-0.6015 *** (0.0000)
CA/CL _{it-1}				0.3144 (0.1948)		
WKCA/OPRE _{it}	0.3718 *** (0.0000)	-0.5792 *** (0.0000)		-0.5919 *** (0.0000)	0.1945 *** (0.0000)	0.0739 (0.5112)
WKCA/OPRE _{it-1}			0.0938 *** (0.0022)			
WKCA/IAS _{it}		-0.0176 (0.8780)	0.0092 (0.7349)	-0.0630 (0.7165)	0.0013 (0.2924)	0.1084 *** (0.0000)
WKCA/IAS _{it-1}			0.2278 *** (0.0000)	-0.0100 (0.9380)		
CRED-DEBD _{it}						
CRED-DEBD _{it-1}						
DEBLT _{it}						
DEBLT _{it-1}						
FCFC/OPRE _{it}	-0.0005 (0.8621)					
FCFC/OPRE _{it-1}						
FCFO/OPRE _{it}						
FCFO/OPRE _{it-1}			-0.0011 (0.5847)	0.0165 (0.2526)		
LEV _{it}	0.0019 (0.9632)	-0.0007 (0.9926)	0.0015 (0.9005)	0.0081 (0.9161)	0.0024 (0.8893)	0.0073 (0.9079)
LEV _{it-1}			0.0032 (0.8038)	-0.0024 (0.9763)		
DOL _{it} (volume)	0.0028 (0.7690)	-0.0025 (0.8832)	0.0002 (0.9296)	-0.0024 (0.8833)	0.0013 (0.7389)	-0.0016 (0.9087)
DOL _{it-1} (volume)			0.0024 (0.4920)	0.0022 (0.9213)		
DOL _{it} (price)	0.0012 (0.7126)	-0.0004 (0.9403)	0.0008 (0.5380)	0.0004 (0.9623)	0.0009 (0.5167)	0.0000 (0.9952)
DOL _{it-1} (price)			-0.0002 (0.8926)	-0.0014 (0.8503)		
FIAS/OPRE _{it}				0.0252 (0.8157)		0.0343 (0.7064)
FIAS/OPRE _{it-1}						
INT/DEB _{it}	-0.0346 (0.5708)	0.0589 (0.5839)	-0.0584 *** (0.0005)		-0.0149 (0.5519)	
INT/DEB _{it-1}			-0.2110 *** (0.0018)	-0.5048 (0.2473)		
DEB/OPRE _{it}	0.0153 (0.2620)		-0.0289 *** (0.0000)		-0.0030 (0.6723)	
DEB/OPRE _{it-1}			0.0881 *** (0.0000)			
DEB/EBITDA _{it}	0.0003 (0.9610)		0.0009 (0.7276)		0.0004 (0.8889)	
DEB/EBITDA _{it-1}			-0.0007 (0.7150)			
DEB/EQUITY _{it}	-0.0046 (0.7137)		-0.0016 (0.6428)		-0.0032 (0.5296)	
DEB/EQUITY _{it-1}			0.0013 (0.7413)			
ROE _{it}	0.1072 *** (0.0003)	-0.0174 (0.7387)	-0.0017 (0.9269)	0.0178 (0.8742)	0.0983 *** (0.0000)	-0.0072 (0.8821)
ROE _{it-1}			-0.0333 (0.0943)	-0.0495 (0.6967)		
ROK _{it}				-0.0718 (0.6904)		
ROK _{it-1}					0.0072 (0.5222)	
Adjusted RO _{it}		0.0706 (0.1059)				
Adjusted RO _{it-1}				-0.0096 (0.8400)		
EBIT/INT _{it}	0.0001 (0.4404)	0.0002 (0.4262)	0.0001 (0.2786)	0.0001 (0.8649)	0.0001 * (0.0675)	0.0002 (0.3858)
EBIT/INT _{it-1}			0.0001 (0.2609)	0.0002 (0.6142)		
ROS _{it}						
ROS _{it-1}				-0.0344 (0.4041)		
TAX _{it}	0.0156 (0.8638)	-0.0238 (0.8821)	0.0039 (0.9195)	0.0124 (0.9604)	0.0074 (0.8781)	-0.0359 (0.7908)
TAX _{it-1}			0.0138 (0.6686)	-0.0600 (0.7720)		
AV/STAF _{it}	0.0007 (0.5001)	0.0001 (0.9581)	0.0001 (0.8846)	0.0007 (0.7452)	0.0004 (0.3684)	0.0002 (0.8951)
AV/STAF _{it-1}			0.0006 (0.1269)	0.0001 (0.9837)		
AV/EMPL _{it}	0.0010 (0.6378)	-0.0480 *** (0.0000)	-0.0039 *** (0.0000)	-0.0823 *** (0.0000)	-0.0002 (0.8269)	-0.0762 *** (0.0000)
AV/EMPL _{it-1}						
RLFA _{it}						
RFLA _{it-1}						
R-squared	0.0608	0.4941	0.4972	0.6568	0.1394	0.6156
Adj. R-squared	0.0601	0.4894	0.4826	0.6393	0.1376	0.6090
p-value (F-stat)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

References

- Allen, L., et al. (2004). Issues in the credit risk modeling of retail markets. *Journal of Banking & Finance*, 28, 727-752.
- Altman, E.I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance*, 23, 589-609.
- Altman, E.I., et al. (1977). Zeta Analysis: A new model to identify bankruptcy risk of corporations. *Journal of Banking & Finance*, 1, 29-54.
- Altman, E.I., & Sabato, G. (2007). Modeling credit risk for SMEs: evidence from the U.S. market. *Abacus*, 43, 332-357.
- Basel Committee on Banking Supervision. (2014). A brief history of the Basel Committee. Bank for International Settlements.
- Basel Committee on Banking Supervision. (2010). Basel III: A Global Regulatory Framework for More Resilient Banks and Banking Systems. Basel. Bank for International Settlements.
- Beaver, W. (1966). Financial ratios predictors of failure. *Journal of Accounting Research*, 4, 71-111.
- Berger, A.N., et al. (2005). Credit Scoring and the Availability, Price, and Risk of Small Business Credit. *Journal of Money, Credit and Banking*, 37(2), 191-222.
- Cowan, C.D., & Cowan, A.M. (2006). A Survey Based Approach of Financial Institution use of Credit Scoring for Small Business Lending. Office of Advocacy-USSBA. Working paper.
- Fama, E.F. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *The Journal of Finance*, 25(2), 383-417.
- Fisher, I. (1930). *The Theory of Interest*. New York: Macmillan.
- Frame, W.S., et al. (2001). The Effect of Credit Scoring on Small-Business Lending. *Journal of Money, Credit and Banking*, 33(3), 813-825.
- Lintner, J. (1965). The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets. *The Review of Economics and Statistics*, 47(1), 13-37.
- Mantovani, G.M., & Castellan E. (2015). How to rate and score Private Companies? Evidence from the North Eastern Italian Districts. Working Paper.
- Masschelein, N. (2003). The Basel II Capital Accord, SME Loans and Implication for Belgium. *Financial Stability Review-National Bank of Belgium*.
- Ohlson, J.A. (1980). Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research*, 18(1), 109-131.
- Platt, H.D., & Platt, M.B. (1990). Development of a Class of Stable Predictive Variables: The Case of Bankruptcy Prediction. *Journal of Business, Finance and Accounting*, 17, 31-51.

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² Basel Committee on Banking Supervision, Bank for International Settlements 2014.

³ Basel Committee on Banking Supervision, Bank for International Settlements 2010.

⁴ Bureau van Dijk provides complete balance sheet data in the Global Standard Format for global companies. This limits the possibility to have detailed data for a specific company.

⁵ The period of analysis was chosen in order to develop a rating methodology that identifies risks-returns relations in a through-the-cycle perspective (seven years of rating).

⁶ In Appendix – Table 3 the complete output of the regressions for each Country.

AMBIGUITY OF GOODWILL REGULATIONS – A CASE OF POLISH PUBLICLY TRADED ENTERPRISES

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Abstract: *Because goodwill appears as a consequence of consolidation process as well as business combinations, it is a regular item in statements of financial position prepared by modern entities. Polish publicly traded companies are obliged to follow international or Polish accounting standards that both include regulations referring to goodwill. Although Polish standard-setters are aiming at accounting harmonization, Polish legislature is not fully converged with international standards. Moreover, international standards are not precise enough to oblige accounting professionals to act in a certain way when measuring goodwill. Freedom of action arising from ambiguity of choices should be used in a way to achieve relevance and faithful representation of financial information. Through the analysis of European Union and Polish accounting regulations authors suggest that legal foundations of goodwill disclosure and measurement should be more detailed. A survey conducted among Polish publicly traded companies acknowledges that goodwill is a complicated item in financial reports and that is why accounting professionals should pay more attention to disclosed information in order to achieve fundamental qualitative characteristics. Authors' contribution into the modern accounting literature is twofold. First, authors call for a greater attention to significance of information about goodwill, especially on economic substance of goodwill disclosed in financial reports, verifiability, understandability, and a risk regarding changes in estimates included in goodwill valuation process. Second, the importance of right teaching methods is pointed out in order to stress that arithmetical calculations following legal regulations of goodwill are not satisfactory for faithful representation of economic substance of goodwill.*

Keywords: *goodwill, business combinations' accounting, IFRS 3, Polish accounting*

INTRODUCTION

The ongoing combinations of business entities have resulted in gathering economic resources and it enabled many economies to develop and create big industrial organizations. Large-scale entities are important performers on the contemporary capital markets and because of that they are subject of significant importance to the financial well-being of the economy and the nation. It is useful, therefore, to give some consideration to the present business combinations' accounting since financial reporting misstatement might damage the credibility of accounting that is essential to the effectiveness of contemporary capital markets.

The combination of business enterprises comes as a result of the acquisition by one entity (acquirer, acquiring company) of the assets of another entity (acquiree, acquired company) on an ongoing concern basis, either directly (as a merger or acquisition) or indirectly (acquisition of the voting control of the shares of the acquired company). Business combination may be followed by a legal merger (non-consolidation merger; hereafter: non-consolidation goodwill) or may be established by a parent company when buying shares in another entity (consolidation; hereafter: consolidation goodwill). Consolidation goodwill appears in the group financial reports only (consolidated reports) while non-consolidation goodwill may be disclosed in either an individual company financial report or in a consolidated financial report.

The initial valuation of goodwill arising from business combination and the subsequent disposition of goodwill once recorded have gained a lot of research efforts of the accounting profession in the recent years. Its main focus was concentrated on the fundamental difference between pooling and purchase methods of accounting for business combinations and clear statement that the choice of accounting method should not be within management's option. Before the 1950s, the purchase method was prevailing but in the 1960s the predominance of pooling of interests method was observed. The application of purchase method diminished due to 'the goodwill issue', which arose as a result of unchanged book values of net assets acquired and their comparison to the market value of the purchase price. On that account the large amount of goodwill was booked on the day of acquisition that diminished equity on the same day or in the following years. While purchase method required write-off of goodwill decreasing retained earnings (or other positions of equity), the pooling approach accepted summarizing the incomes of combining entities resulting in increased profitability of the entity operating after the merger. Different approaches to goodwill and a need to escape from the constraints of purchase method resulted in the wide acceptance of the pooling approach. Popularity of pooling of interests method also forced accounting theoreticians and standard-setters to crystallise its principles and to clearly indicate the border between the application of pooling of interests method and the purchase method. The controversy relating to business combinations is still a continuing debate although pooling of interests method was restricted in the U.S. in 2001 and in the content of International Financial Reporting Standard in 2004. Weaknesses of contemporary regulations pointed out in the present literature are concentrated on the goodwill accounting, both initial valuation and its subsequent disposition or lack of subsequent disposition.

The article deals with the issue of information disclosure of goodwill arising from consolidation (consolidation goodwill) or from an acquisition (non-consolidation goodwill). The objective of financial reports is to provide summarised information that is useful to users of a financial statement in making decisions about providing resources to entity. In order to fulfil the conceptual requirements, the information provided to the users should contribute to the faithful representation of relevant information about the resources of the entity and how efficiently and effectively the entity's management has discharged its responsibilities to use entity's resources. Through the analysis of European Union and Polish accounting regulations the authors suggest legal foundations of goodwill disclosure and measurement should be more detailed. A survey conducted among Polish publicly traded companies acknowledges that goodwill is a complicated item in financial reports and that is why accounting professionals should pay more attention to information disclosed in order to achieve fundamental qualitative characteristics. Authors' contribution into the modern accounting literature is twofold. First, authors call for a greater attention to significance of information about goodwill, especially on economic substance of goodwill disclosed in financial reports, verifiability, understandability, and a risk regarding changes in estimates included in goodwill valuation process. Second, the importance of right teaching methods is pointed out in order to stress that arithmetical calculations following legal regulations of goodwill are not satisfactory for true and fair view of economic substance of goodwill.

ECONOMIC SUBSTANCE OF GOODWILL

According to contemporary accounting regulations, when the purchase price exceeds the value of net assets acquired, the difference is presented among assets in the statement of financial position. Because of the above algorithm, goodwill represents a residual after allocation of consideration paid to tangible assets, identifiable intangible assets, and liabilities.

The economic notion standing behind the goodwill position shall answer the question why has the premium, which results in goodwill, been paid for the acquired company? The premium was paid usually because the goodwill is already present and was present before business combination and expected earnings justify the consideration. Backman states (1970) that expected (in the future) earnings reflect expenditures made by acquiree in the past for management, research and development, public relations, advertising, patents, and development of staff. As a result of past expenditure it is expected to gain economic benefits in the future due to a premium management, experienced staff or established brand name (Myers, 1977, Kamela-Sowińska, 1996). Moreover, part of goodwill may represent price inflation and part may be permanent reflecting long-time customers and lists of regular customers. Furthermore, previous studies have shown that investors attach different valuation weights to various goodwill components of accounting goodwill numbers (Hirschey, Richardson, 2002). The most valuable goodwill is the one resulting from synergy effect and from going-concern of the acquired entity. The less prized by investors is residual goodwill defined as the excess of purchased goodwill over going-concern goodwill plus synergy goodwill. According to International Financial Reporting Standard No. 3 'Business combinations' goodwill represents future economic benefits arising from other assets acquired in a business combination that are not individually identified and separately recognized.

It is important to stress, that goodwill is bought, not created at the time of a business combination. Although goodwill is in existence, it is not disclosed in the statement of financial position of the acquiree before the acquisition. That means that in the absence of a business combination, the goodwill will not be recorded in the books. The inconsistency in the treatment of goodwill for acquired entities and for those not acquired arises from the confidence that internally generated goodwill shall not be disclosed in financial statement. It cannot be classified as an asset as no reliable measurement is possible in the lack of a purchase price. Because of the above assumption, the literature presents opinions that presenting goodwill for acquired company but not for the acquiring company is illogical (Kripke, 1968). On the other hand, the history of accounting shows that internally generated goodwill, which was not created in the business combination transaction, was presented in the balance sheet in the past. Nobes and Norton (1989) demonstrate that in the UK and the Netherlands, where companies write off consolidation goodwill against retained earnings, internally generated brand names were used to fulfil the 'hole in the balance sheet'.

Furthermore, goodwill does not incorporate new intangibles that are created after the combination. While on the other hand, the newly created (internally generated) goodwill may serve as an offset to the write-offs of goodwill in the years following the business combination. Goodwill shall not include overpayment for the acquired entity that arose i.e. due to mistaken fair value measurement. Previous research provides evidence that goodwill is not typically overvalued when initially recorded (Churyk, 2005), but in the situation when acquirer overpays for the acquiree the goodwill impairment should be recorded at the day of acquisition.

The magnitude of goodwill value is determined by the type of consideration and is significantly influenced by the market value of this payment. As stock prices fluctuate widely, mostly because of the factors not related to business combination, it seems obvious that the measurement of goodwill is a subject to significant distortions in a short period of time and disclosed values obsolete as the time passes. Moreover, the goodwill definition present in the accounting theory is an operational definition that simply refers to a method of measurement in

order to find arithmetic difference. Neither does it point out the economic nature of goodwill nor the resources encompassed in it. Because of the above, goodwill disclosed in the financial report that is based on the measurement technicalities serves as a substitute for an asset recognition. However, in the contemporary accounting practice the residual goodwill misses more fundamental approach describing the economic substance of this position of the financial report. The issue is even more important as the opinion stating that purchased goodwill is not an asset can be found in the literature (Tollington, 1998).

TYPES OF GOODWILL

Goodwill may occur as an asset of an entity, regardless of the possibility of its verification. The occurrence of goodwill may indicate higher fair value, usually market value, of a given entity in relation to the sum of the fair value disclosed in the financial reports of net assets. From the point of view of the market functioning, the main form of verification of the occurrence or not of the goodwill as an asset of the entity is a carried out particular transaction to acquire all or part of the entity. From this point of view there can be distinguished:

- internally generated goodwill,
- purchased goodwill.

The internally generated goodwill occurs in case of a higher fair value of the entity in relation to its carrying amount. In this case, the carrying amount is understood as the value of entity's equity. The internally generated goodwill of the company may not be recognized in the financial statements as an asset of the entity and its existence may affect the conditions of a possible purchase of this entity, its organized part, or interest in it. It should be emphasized that the company's internally generated goodwill is often used for the valuation. One of the concepts of using the financial statements for purposes of determining the value of the business entity for the owners is the Hoogendoorn model (Hoogendoorn, 2000). Hoogendoorn has proposed transforming the traditional financial reports to the prospective financial reports using the internally generated goodwill of the company (Kumor, Strojek-Filus, 2013).

Purchased goodwill may be the result of the acquisition of another entity (or its organized part) then there is the following relationship between the accepted (negotiated) price and goodwill (Strojek-Filus, 2013):

$$\text{Purchase price} = \text{fair value of acquired net assets} + \text{purchased goodwill}$$

Goodwill disclosed in a particular transaction is acquired by the acquiring entity. A business entity may acquire goodwill through the purchase of the entire entity, its organised part or acquisition of shares offering control, joint control in it or allowing for exerting a significant impact on this entity. From this point of view there can be identified:

- non-consolidation goodwill purchased when buying assets in a company,
- wholly or partially purchased goodwill in a transaction done by a holding company (consolidation goodwill).

Given the nature of the financial statements in which the purchased goodwill is presented, the following can be distinguished:

- goodwill representing assets of business entity, presented in the financial statement.

- goodwill as the consolidation difference, presented as an asset of the group in the consolidated financial statement.

Goodwill as the consolidation difference is the result of implemented consolidation procedures in the entities' financial statements included in the group. One of the stages of consolidation is to establish and carry out the so-called initial consolidation of capital. As part of this step, the overvaluation of the acquired shares representing control manifested by a price surplus paid for them in relation to the fair value of net assets is determined.

From the point of presenting company's goodwill in the financial report, the following can be distinguished:

- goodwill constituting business entity's separate item of assets,
- goodwill 'hidden' under a different report item.

The latter is the case in the framework of a simplified version of the equity method, in which the purchased goodwill is recognized by the established value of the investment. Goodwill determined under the procedures of the equity method is part of the investment value in the statement of financial position³. The user of the financial reports is not able to assess the effect of the acquisition of shares by the analysis of goodwill or negative goodwill, as these items are not separated. They are an invisible element of the share value to the user. In this case, goodwill 'is hidden' in the carrying amount of the shares in a subordinated entity, as illustrated in Figure 1.

CARRING AMOUNT OF SHARES	
The fair value of the net assets of the subsidiary attributable to the investor according to their percentage in the share capital of the entity	Remaining goodwill

Figure 1: Structure of investments valued using the equity method

Source: own elaboration.

Goodwill, being part of the investment, is not distinguished but is a subject to accounting according to the rules laid down for the acquired or consolidated goodwill. From the standpoint of the economic effect and sense of acquiring another entity or shares in it, there can be pointed out:

- positive goodwill, called most frequently goodwill and
- negative goodwill, which, depending on the solutions adopted in the accounting regulations, can be shown as a separate report item of liabilities or recognised as income in the period in which the acquisition was carried out⁴.

The article deals with non-consolidation and consolidation goodwill purchased by a holding company when buying shares of another entity or acquired in the acquisition transaction resulting in legal merger of joining entities.

³ The Accounting Act permits the use of the equity method in the separate financial reports, and in accordance with IAS/IFRS application of this method is allowed only in the consolidated financial reports.

⁴ The Polish accounting regulations contain a solution that is a combination of both interpretation variants of negative goodwill.

GOODWILL METHODOLOGY AND PRESENTATION

The excess of purchase price over the book value of the acquired company's net assets was the first accounting measurement of goodwill (positive goodwill) (Nobes, Norton, 1996). As the amount recorded as goodwill required a comparison of the fair value of consideration transferred and the book value of assets purchased, the literature presents problems in measuring the proper amount of goodwill as well as the potential occurrence of unrecorded goodwill due to the misstatement of market price. Sharp price fluctuations that accompany merger announcements and propriety of using a market price to value large blocks of stock given as a part of consideration were mentioned among other practical issues (Copeland, Wojdak, 1969).

Contemporary the calculation of goodwill requires the comparison of fair value of consideration paid with the fair value of net assets purchased. The high quality of goodwill valuation is then a consequence of properness of fair value measurement that can be complex. Moreover, estimating fair value of the consideration given may be problematic when purchase price encompasses various components in addition to the cash.

The excess of fair value over book value resulting from an acquisition was treated differently in the following years after business combination. Figure 2 exhibits the number of alternatives for subsequent disposal of goodwill that was described in the literature.

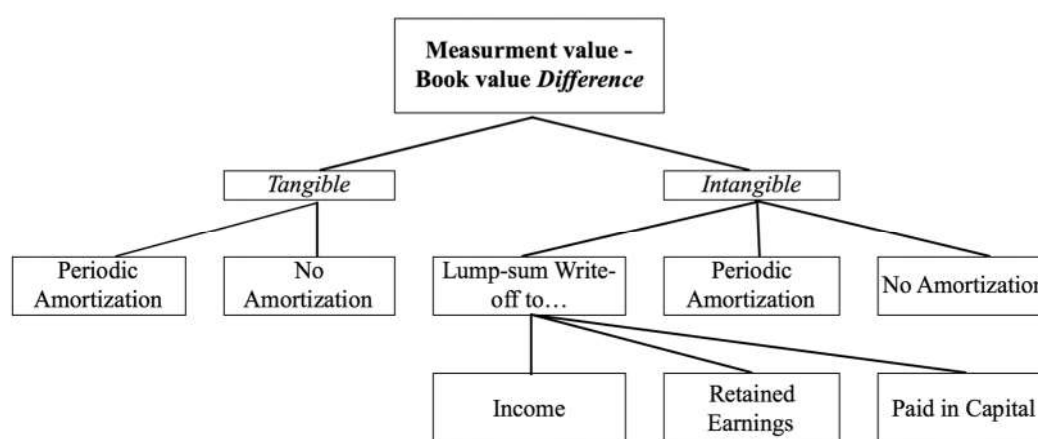


Figure 2: Accounting treatment of goodwill.

Source: Based on the goodwill classification presented by Copeland, Wojdak, 1969, p. 59.

Accounting theory accepted allocation of goodwill to tangible or intangible assets, as well partial allocation to both assets' categories. Goodwill allocated to assets was then amortized periodically or not amortized at all. Accounting history has noticed a period when goodwill was subject to amortization only in years when earnings were unusually good. Conversely, no amortization was recorded during difficult years (Knortz, 1970). Until the mid of 1940s prevailing accounting practices of goodwill treatment included the lump-sum write-off to income, retained earnings or paid capital. Direct write-offs of goodwill to earned surplus or capital surplus have not been permitted in the USA since 1953 (Copeland, Wojdak, 1969).

The next acceptable practice was that of systematic amortization of goodwill against earnings over the period of 40 years. There was no justification of the 40-year limit other than an unofficial statement that, through the use of such an extended period, charges against earnings would be minimized. In that period of goodwill accounting history, the restatement of acquiree net assets' values was introduced. Goodwill was calculated as the positive difference between the fair (market) value of consideration paid and the fair value of net assets acquired

in a business combination. In these years, the literature presents controversies referring to the deterioration in residual goodwill values. The opinion that changes in stock prices' market values should be the indicators for changes in goodwill estimates can be observed (Knortz, 1970). Knortz states that stock prices are appropriate basis for indicating whether goodwill values had been absorbed in the process of generating future economic benefits. He states that turning pages of the calendar are not sufficient evidence of diminishing value of goodwill, as these values might not necessarily be lost with the passage of time. Moreover, if an entity regularly spends money on research and development, advertising, and personnel training etc., the goodwill values are given expression in exchange price at the time of an acquisition. If these expenditures together with amortization of goodwill are charged to earnings, the revenues of a single year will bear a duplicated cost and economic profits will be understated. Backman indicates (1970) that the more is paid for the acquiree (and the larger goodwill as a consequence of a high purchase price) the less would be earned in the following years (due to goodwill amortization). In his opinion, amortization of artificially created goodwill made no economic sense and acted as an incentive to pay less for the acquired company because of the adverse effect on earnings. The adverse effect on future earnings may influence profit centres of the combined company and alter the ability to retain or employ new staff members.

Mandatory amortization of goodwill against reported earnings ended at the same time when pooling of interests method was abandoned, i.e. in 2001 in the U.S and in 2004 when IFRS 3 was published. Regulators did away with the presumption that acquired goodwill and other acquired intangible assets have finite lives and eliminated amortization. Instead of amortization, standards mandated for annual test for goodwill impairment. Goodwill shall be tested in a three-step process according to subsequent accounting for goodwill. The first phase measures the carrying amount of cash-generating unit (units) that goodwill is being allocated to at the day of the acquisition. As goodwill does not generate cash flow independently of other assets or a group of assets, it is required to allocate goodwill to an individual cash-generating unit (or units) that serves as the lowest level within the entity at which the goodwill is monitored. In the second step, the entity measures the recoverable amount of the cash-generating unit, and the third phase requires comparison of the amounts calculated in the first and second steps. If the carrying amount of the unit exceeds the recoverable amount of the unit, the entity shall recognize the impairment loss. After goodwill impairment losses are recognized, subsequent reversals of impairment are prohibited. Information about the carrying amount of goodwill must be disclosed on an annual basis, along with the estimates used in the valuation process. Goodwill write-offs are material charges against earnings that do not typically coincide with changes in tangible, other intangible assets or cash flows. Furthermore, as fair values are not readily available for many cash-generating units and require independent valuations, managers enjoy a substantial amount of discretion. The information value of write-offs disclosure lies in the role they play as a signal of changes in the future earnings potential of the entity or important implication for the ongoing value of the company (Hirschey, Richardson, 2002).

Polish accounting regulations also present the algorithm for goodwill calculations ignoring the economic sense of this financial statement position. Goodwill should be carried at cost less any accumulated amortization and any accumulated impairment losses. Therefore goodwill is not a subject to impairment but to amortization and write-offs recognition. According to Polish Accounting Act, goodwill should be amortized on a systematic basis over 5 years. There is a possibility to extend amortization period to 20 years but a non-rebuttable presumption exists that the useful life of goodwill will not exceed 20 years from initial recognition. The amortization of each period is presented as an expense in the income statement. An entity presenting goodwill from business combination should, at least at each financial year-end, estimate impairment losses of goodwill. Estimation of impairment requires valuation of recoverable amount of goodwill that is amortized. Because Polish regulations do not give any

detailed guidance as to check whether impairment occurs, Polish entities should follow International Accounting Standard No 16.

Polish legislature still accepts recognition of negative goodwill. Any excess of fair value of net assets over consideration transferred is presented among liabilities as a negative goodwill. Present regulations limit the value of negative goodwill to the amount of fair value of fixed assets (excluding non-current marketable financial assets) requesting the excess to be presented as revenue at the date of business combination. The treatment of negative goodwill in the following years depends whether expected future losses and expenses occur or not. In short, present Polish legislature in the scope of negative goodwill is in accordance to International Accounting Standard inapplicable since 2004.

TECHNICALITIES OF CONSOLIDATION GOODWILL

Consolidation goodwill is also calculated as the difference between the purchase price and the fair value of what is purchased. Unlike the non-consolidation goodwill, the consolidation goodwill is the result of carrying out procedures for the consolidation of the financial statements included in the holding company. It is set within the so-called initial consolidation of equity that is the date of acquisition of shares representing the parent company's control over a subsidiary. In terms of disclosure in the consolidated financial reports and amount of goodwill, the accepted concept of consolidation, which is the basis for solutions to the accounting law, is essential.

The literature indicates the following concepts for the consolidation of financial statements:

- proprietary concept (used in the proportional consolidation method)⁵,
- parent entity concept,
- parent entity extension concept, and
- business entity concept (Ignatowski, 2003).

In case of the parent entity extension concept, goodwill attributable to a majority stake is only recognized, while the part relating to the minority shareholdings is ignored. In contrast to the methods of the parent and minority shareholdings, they are also valued at fair value. Solutions that are valid in the current wording of the basic act governing the preparation of financial reports in Poland – the Accounting Act – are in line with the parent entity extension concept.

All of the goodwill is recognized within the business entity concept in the consolidated financial reports, and therefore this part that is attributable to minority shareholdings, called for this reason non-controlling interests. Non-controlling interests in this case are stated at the fair value including goodwill related to them. The business entity concept is the basis of the solutions adopted in IAS/IFRS in the preparation of the consolidated financial reports. The valuation of non-controlling interests adopted by the parent entity is also important in this case:

- proportional valuation,
- fair value valuation.

⁵ The proportional method is not used under the existing IAS/IFRS (IAS/IFRS – International Accounting Standards / International Financial Reporting Standards). It was replaced by the equity method, but it is allowed in the Accounting Act for the settlement of joint control relations.

According to the proportional method, the valuation of non-controlling interests is carried out based on the fair value of net assets acquired in the proportion attributable to the shares. In turn, the market value should be adopted as the basis for determining the fair value, if there is an active market or by reference to the value of controlling interests, taking into account discounts or other valuation methods. Using these two methods one can get different results concerning goodwill from consolidation.

The differences between the solutions in determining the goodwill of consolidation adopted in the Accounting Act and IAS/IFRS are not merely technical. These are important differences on the conceptual ground, so a different approach to demonstrate the effects of the consolidation of financial statements. The Accounting Act expressly refers to the concept of parent entity, whereas IAS/IFRS to the concept of business entity. The most serious consequences of these differences precisely focus on the level and method of goodwill presentation.

It should also be noted that the Accounting Act allows showing up to a certain amount of negative goodwill, while IAS/IFRS do not allow such a possibility, considering the negative difference in total as revenue for the period – income on the occasional purchase. The rules for determining the difference of consolidation in accordance with Art. 60 of the Accounting Act can be illustrated by the following equation:

The purchase price of the shares by the parent company (PP) – the sum of the fair value of net assets attributable to the acquired shares (NAF) = positive consolidation difference = goodwill (G)

Whereat $PP > NAF$

Goodwill is recognized as a main separate item (it cannot be combined with other items) of the consolidated statement of financial position. In the second case the purchase price is less than the sum of the fair value of the net assets of the subsidiary acquired by the proportion of shares. The above can be illustrated by the following equation:

The acquisition price of the shares by the parent company – the sum of the fair value of net assets attributable to the acquired shares = negative consolidation difference = negative goodwill (NG)

Whereas $PP < NAF$

Thus, the relevant part of the excess of net assets at fair value over the value of the shares is negative goodwill, which - in accordance with the Accounting Act - must be shown as a separate liabilities item in the consolidated statement of financial position⁶.

In accordance with IFRS 3, goodwill is calculated according to an algorithm shown in Figure 3 (Strojek-Filus, 2012).

⁶ The solutions of the Accounting Act constitute a specific hybrid variant to demonstrate the whole negative difference as negative goodwill and recognize it as revenue for the period. To the amount of the fair value of acquired assets, excluding long-term financial assets listed on regulated markets – must be shown as negative goodwill. Above this value – must be shown as income of the period and hence by a solution referring to IAS/IFRS.

Transferred consideration (C)
+
The value of non-controlling interests in the acquiree (I)
+
The value of the share capital of the acquiree, held by the acquirer, if the merger is implemented in stages (SC)
-
The net value of identified assets acquired and assumed liabilities (AA)
=
Goodwill (G) or gain from bargain purchase (P)

Figure 3: Determination of goodwill or a gain from the bargain purchase

Goodwill occurs if $C + I + SC > AA$

Accounting treatment for consolidation goodwill is the same as that for non-consolidating goodwill both in international standards and in Polish accounting regulations.

It is worth noting that such a significant difference between the solutions of the Accounting Act and IAS/IFRS make the comparability of data and proper assessment of the impact of the acquisition of other entity or shares in it difficult (and sometimes impossible) in business practice. From the point of view of Polish economic practice the problem is even greater, as part of the Polish companies prepares their financial reports in accordance with IAS/ IFRS⁷, and part with the Accounting Act. So the comparability is difficult also between Polish entities.

Presented accounting regulations for consolidated and non-consolidated goodwill initial valuation and measurement in subsequent years show that faithful presentation of a business combination (including goodwill arising from this transaction) requires detailed disclosure in order to enable users of financial statements to understand the economic phenomena hidden behind the accounting numbers. Disclosure should encompass *inter alia* methods of fair value measurement of purchase price as well of net assets acquired, financial parameters engaged in the methods, the valuation techniques used for non-controlling interests measurements, assessment of changes in goodwill valuation including cash generating units' expected cash-flows. Lack of detailed information or imprecise data in financial reports may be misleading and may cause incorrect judgment about economic situation of the entity. Significant discrepancies between Polish accounting regulations and IAS/IFRS should also be noted as they hinder the comparability of financial reports.

From the point of view of the educational process of accounting it is worth highlighting that the correct determination and interpretation by the student of goodwill requires:

⁷ These are companies quoted in public trading on the basis of Regulation (EC) No. 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards – International Accounting Standards. Official Journal of EC L 243, 11.09.2002.

- knowledge of methods and specific rules for determining the fair value of assets and liabilities,
- fluent knowledge of the scope and structure of financial statements,
- the ability to use an algorithm for determining goodwill under the current law,
- the ability to associate the causes and consequences of the financial and legal capital ties between business entities.

The indicated conditions, however, are not sufficient in the light of further amendments to IAS/IFRS and solutions laid in the Accounting Act. At present, it should also be emphasized:

- the importance of ethical attitude of accountants and managers,
- the knowledge of economic sense of goodwill and on this basis its presentation in the financial statements
- the ability to associate dispersed information in the financial statements related directly or indirectly to the formation and accounting of goodwill.

According to the authors, the teaching process in terms of goodwill requires, *inter alia*, the analysis of various cases described in the literature, but also case studies of economic practice in which they are discussed and debated taking into account different aspects of this asset.

RELATED RESEARCH AND ANALYSIS OF CASE STUDIES

On the basis of economic and accounting theory it is difficult to allocate goodwill as an asset to strictly defined industries in the context of the broader economic activity. This resource is not homogeneous in terms of internal structure, which could be regarded as a characteristic feature of the industry. From the economic sense and substance of goodwill it can be concluded that it is the amount ‘accompanying’ the occurrence of assets that are not recognized in the financial statements, but have a clear and often – significant – impact on the market value of the business entity, which is reflected in the agreed purchase price.

However, based on the literature one can point out studies, conducted in many countries, in which the relationship between the occurrence and percentage of goodwill in assets and industry was analysed. Strojek-Filus⁸ (2013) had put for testing companies quoted on the Stock Exchange in Warsaw and companies from over-the-counter trading in years 2000-2010. Goodwill occurred primarily in the first group of companies. In the non-public companies, goodwill occurred very rarely and was less than 1% of value of total assets. A significant increase in the share of goodwill in the assets presented in the consolidated financial statements

⁸ Detailed results of research on the determinants of prevalence of goodwill the author presented in the book entitled ‘Determinanty oraz skutki wynikowo-bilansowe identyfikacji i rozliczania wartości firmy w grupie kapitałowej’ (*Determinants and balance sheet effects of identification and accounting of goodwill in the group*), Katowice: Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach, 2013.

(from 0.19% in 2000 to 8.56% in 2010) occurred during the whole researched period. Based on the conducted studies the author has concluded that the consolidation goodwill appears most commonly in the Polish economic practice. Strojek-Filus also indicated industries in which goodwill accounted for the largest percentage of assets reported in the financial statements. These include: telecommunications (12.6%), hotels and restaurants (10.1%), electric machinery (9.5%), computer science (9.2%), food industry (7.8%) and utilities (7.1%). On the other hand the smallest proportion occurred in the energy sector (0.1%), fuel industry (0.4%) and plastics (0.7%).

The study also showed that goodwill most often occurred in the industries in which its share in the assets was the largest. The exception was the fuel industry with the highest percentage of companies with goodwill.

It is worth noting that the study by Glaume and Wyrwa (2011) on companies quoted on major European stock exchanges on the basis of the financial reports for 2009 showed that the highest average goodwill occurred in telecommunications, pharmaceutical, banking and media industries. The largest share of goodwill in assets occurred in the media, telecommunications, services, engineering industry (over 70%). Most of the results presented are consistent with the results obtained by Strojek-Filus for Polish companies. In light of the presented research results it can be concluded about the 'sectorial' goodwill among companies quoted in public trading.

An industry particularly interesting from the point of view of goodwill is the media. This industry is 'burdened' with many derivatives of intangible assets that are not recognized in the statement of financial position, e.g. the trust of viewers, viewership, the system of celebrities gained to participate in programmes etc. The goodwill presented in the financial reports of selected companies quoted on the Stock Exchange in Warsaw for the years 2013 and 2014 was analysed for the purposes of this paper. Entities were selected in accordance with a key that demonstrated goodwill from the legal acquisition of other entity and goodwill on consolidation. The financial reports of two groups of companies from the media sector: TVN and Agora S.A. were compared in terms of the presence of goodwill on consolidation and explanations of this amount presented in the financial reports. Analysis of data disclosed in Wirtualna Polska S.A. reports was conducted in order to investigate verifiability and understandability of data provided on legal acquisition.

Case 1: Media group TVN S.A.

In 2014, the Parent Company TVN was controlled by the International Trading and Investments Holding based in Luxembourg. In 2015, the Group was subject to further ownership changes. In the report there is no clear presentation of the group structure with a clear indication of the percentage of subsidiaries, fellow subsidiaries and associates.

The basic data on the goodwill shown in the consolidated financial report for 2014 and 2013 are presented in Table 1 and 2.

Table 1: Data on goodwill in the consolidated financial report

Year	Total assets in thou. PLN	Net profit in thou. PLN	Goodwill on consolidation in thou. PLN	Goodwill in investments in subsidiaries in thou. PLN	Impairment of goodwill on consolidation in thou. PLN
2014	3 814 767	189 350	144 127	434 959	0
2013	3 899 259	- 206 881	144 127	409 040	25 973

Table 2: Additional information on goodwill in the consolidated financial report

Year	Accounting policy on determining goodwill	The method of non-controlling interest valuation	Recognised goodwill included in investments under the equity method	Cash generating units	The adopted baseline test for goodwill impairment
2014	The formula for determining the goodwill according to IAS/IFRS	Does not refer	yes	yes	No data
2013	The formula for determining the goodwill according to IAS/IFRS	yes	yes	yes	No data

The goodwill is shown in the consolidated statement of financial position as a consolidation difference, which is a separate reporting item in the amount of PLN 144 127 thousand in the consecutive years 2013 and 2014. Financial report contains information about the acquisition of shares in the STAWKA Company on 16 October 2014 by the group. Buying more shares led to the loss of non-controlling interests. The report does not contain information on the conditions of the transaction (the amount paid, the fair value of net assets STAWKA Company, accounting policies used in the valuation of the company's assets at fair value). The consolidated statement of financial position shows that the company's value has not changed since 2013 and so the goodwill as a result of this transaction.

Moreover, the report also demonstrates the goodwill included in investments in associates valued by the equity method (note 26), broken down by:

- net assets,
- goodwill, and
- the carrying value of the investment.

The report gives the information on the conducted goodwill impairment test that confirmed the retention of the current value in 2014, although the allowance of PLN 25 973 thousand was carried out in 2013 due to the impairment of the cash-generating unit – teleshopping centre. The report for 2014 indicated two cash-generating units:

- thematic TV channels,
- TV production unit.

There is no data on conducting a test on, e.g. an adopted detailed projection period, the changes in the real rate of free cash flow to firm and the discount rate.

The disclosure concerning the correction of the goodwill calculation in investments in nC+ associate is given in note 26. It is indicated as a reason for the adjustment to recognize an additional provision in the amount of PLN 20 972 thousand and reduction of deferred tax asset.

Therefore, the Group's share in the net assets of nC+ decreased by PLN 6 923 thousand, and goodwill increased by that amount. There is no value given after the adjustment.

In authors' opinion, the information disclosed by Media Group TVN is not clear and not sufficient enough in order to serve as a basis for the proper economic evaluation of goodwill included among other assets that are to generate future economic benefits. Because of the above, users of financial reports should pay special attention to the 2014 financial results that are considerably worsen when compared to previous years' financial profits.

Case 2: Media group AGORA S.A.

Agora Group consists of 16 subsidiaries, 5 jointly controlled and associates accounted for by the means of the equity method and 2 non-consolidated companies (including one in liquidation).

The basic data on the goodwill presented in the consolidated financial report for 2014 and 2013 is shown in Table 3 and 4.

Table 3: Data on goodwill in the consolidated financial report

Year	Total assets in thou. PLN	Net profit In thou. PLN	Goodwill on consolidation in thou. PLN	Goodwill in investments in subsidiaries in thou. PLN	Goodwill impairment on consolidation in thou. PLN
2014	1 556 499	- 11 026	311 104	No data	63 265
2013	1 642 857	1 179	374 369	No data	0

Table 4: Additional information on goodwill in the consolidated financial report

Year	Accounting policy on determining goodwill	The method of non- controlling interest valuation	Recognised goodwill included in investments under the equity method	Cash generating units	The adopted baseline test for goodwill impairment
2014	The formula for determining the goodwill according to IAS/IFRS	yes	No data	yes	yes
2013	The formula for determining the goodwill according to IAS/IFRS	yes	No data	yes	yes

Goodwill occurs as a consolidation difference, which is a separate item in the statement of financial position reports and – in the context of the equity method application by the group – as a component of the value of shares measured by this method. In the explanatory notes there are no figures about how to determine the goodwill, although the adopted method of valuation of non-controlling interests is indicated. In 2014, there was a strengthening of control in Helios S.A., Ad Taily Sp. z o.o., Sport4People Sp. z o. o, Sir Local Sp. z o. o. subsidiaries by taking

up the newly issued shares (Consolidated Financial Report of Agora, 2014, pp. 62-64). There is no data on adopted solutions in the determination of fair value of net assets of subsidiaries and determining the difference of consolidation. The report introduces no explanation (figures) on goodwill included in the value of investments for valuation using the equity method. This also applies to the transaction of acquisition of shares in order to strengthen a significant impact on associates.

In the note explaining the goodwill as the consolidation difference, there are presented centres generating future cash flows broken down by:

- Internet,
- newspapers and magazines,
- radio activity,
- outdoor advertising segment,
- market for film screening ,
- sport4people.

There is also given a detailed projection period of 5 years to the test for goodwill impairment. The real rate of changes in free cash flow to firm and the discount rate before tax are also indicated for this period. There is no explanation provided for the adopted amounts.

The information provided is necessary to verify goodwill for making a possible write-off of goodwill impairment. In addition to the data, there are no explanations and calculations of the test for the impairment write-off made in 2014. From the complementary report on the consolidated financial reports emerges that the write-off due to the goodwill impairment in part refers to two monthly magazines. The remaining amount of the write-off is not explained as to the cause.

The report on the activities of the Group Management Board of Agora S.A. for 2014 to the consolidated financial reports includes general information about testing for the impairment of assets (Consolidated Financial Report of Agora, 2014, p. 50)]. There are no more details.

The data published in the report on the formation of the consolidation difference or lack thereof at strengthening controls is not sufficient for a proper evaluation of this asset of the group. Although information on the carried out write-off contains required key figures by IAS/IFRS, but it does not allow the verification of the amounts shown. There is also no clear and transparent indication of the reasons for the write-off.

Case 3: Media group Wirtualna Polska Holding S.A.

In 2014 Wirtualna Polska Group encompassed 13 subsidiaries. On 1 October 2014 a legal merger followed on an acquisition of Wirtualna Polska S.A. that was subject to division into two organized parts. The Group decided that assets and liabilities separated from Wirtualna Polska S.A. constituted a business and were legally merged into the acquirer. A business merged constitutes the integrated set that is capable of being conducted and managed as a business because the department of editorial and advertising activities was separated leaving e-Commerce Centre within existing Wirtualna Polska S.A.

The purchase price paid for Wirtualna Polska S.A. amounted for PLN 382 498 thousand and included no contingent consideration. With reference to the acquisition of Wirtualna Polska S.A., the Group concluded a loan agreement and it was granted loans in total amount up to PLN 270 million, of which PLN 175 million was dedicated for the purchase of Wirtualna Polska S.A. The remaining part of the consideration transferred was financed in the form of a capital increase.

The acquisition method was used in order to account for a business combination and positive goodwill was disclosed in financial report. According to data presented in financial report, goodwill relates to a cash-generating unit encompassing trademark “WP.pl”. Trademark with unlimited time of life was valued at PLN 102 500 thousand. The basic data on the goodwill presented in the consolidated financial report for 2014 is shown in Table 5.

Table 5: Data on goodwill in the consolidated financial report

Year	Total assets in thou. PLN	Net profit in thou. PLN	Goodwill in thou. PLN	Goodwill from business combination in thou. PLN	Goodwill impairment in thou. PLN
31.12.2014	569 820	4 149	124 833	92 028	0

The amount of goodwill presented in financial reports was allocated to 4 different cash-generating units based on IAS/IFRS requirements. The largest one is Wirtualna Polska S.A. arising from the legal acquisition described above. The entity presents detailed information about the assets and liabilities’ acquisition-date fair values. Summary of disclosed information is presented in Table 6.

Table 6: Additional information about goodwill calculations

Item	In thou. PLN
Consideration transferred in the acquisition	382 498
Cash and cash equivalents	5 659
Fixed assets	44 392
Trademarks	102 500
Website and WP.pl emails	152 300
Copyrights and other intangible assets	7 699
Trade receivables	31 519
Other current assets	27 661
Trade liabilities	(32 345)
Loans	(477)
Provisions and contingent liabilities	(2 872)
Deferred tax liabilities	(45 566)
Net assets acquired (in total)	290 470
Goodwill	92 028

Additional to the information presented in the Table 6, the reporting entity informs that the costs of the acquisition amounted for PLN 12 645 thousand and the indicated value was expensed in the profit and loss in 2013 and 2014.

Goodwill was subject to an impairment test as at 31 December 2014. Recoverable amount of cash-generating unit was based on the calculations of value in use. Basic assumptions that are material to the assessments made include annual revenue increase ratio and discount rate used in calculating the values. Cash flow projects were prepared based on the 2015 budget, as well as past financial results and managements' plans. There is no information regarding specific amounts of revenue increase ratio used, except for a ratio used for residual period beyond the five-year forecast period, at the level of National Bank of Poland inflation target of 2,5%. Discount ratio was estimated using available macroeconomic and market data and it amounts 10,1%.

DISCUSSION

Goodwill is – inherently – an asset much more difficult to assess correctly and accurately than other assets. Its economic sense is based on a proper assessment of other resources not recognized in the statement of financial position. Therefore, it requires special care and detail in the presentation of the reporting and explanatory notes.

The analysis of selected cases showed that disclosures related to acquired goodwill presented in the financial reports are not sufficient to assess and correctly interpret this asset of an entity and group. Great flexibility in a way and scope of information disclosure is noteworthy, particularly concerning the original determination of goodwill and impairment testing of its value. Data on the solutions adopted in determining the fair value of net assets and the determination of non-controlling interests is essential in this case. This discretion also applies to data on the size of the base adopted for the cash-generating units. Despite formal complying with the requirements of IFRS 12 on additional disclosures regarding goodwill in affiliates, the amount is still difficult to interpret. There is no justification for taken baselines if they are given in the report.

Conceptual framework states that verifiability helps assure that information faithfully represents the economic phenomena it purports to represent. Verifiability means that different knowledgeable and independent observers could reach consensus, although not necessarily complete agreement, that a particular depiction is a faithful representation. Based on our findings it can be stated that goodwill financial reports' disclosure does not provide required information in order to achieve verifiability in the case of 3 analysed entities. It is not possible to conduct neither direct nor indirect verification, because users of financial statements do not have any detailed information about input data, formulas or techniques used in order to recalculate the outputs using the same technology. Moreover, underlying assumption relating to the future as well as methods of compiling the information was not disclosed.

Given that goodwill is usually a significant part of the total purchase price and important element of assets, users of financial reports might require a quantitative, and – what is more important – detailed qualitative description classifying, characterizing and presenting information clearly in order to make it understandable. Failure to comply with international standards and conceptual framework requirements might lead to the situation when asset recognition criteria are not met. The observation made from the analysis shows that entities do little more than repeat the wordings from IAS/IFRS. This practice does not ensure high quality of financial reports. Furthermore, the information about the components of goodwill is omitted, and mathematical calculation is emphasized prioritizing the residual character of goodwill. Unverifiable estimates resulting in goodwill measurement and amount of impairment loss result in decrease in reliability. Subjectivity embedded in the application of mathematical formulas threatens the relevance of disclosed information. On the other hand, subjectivity and hard-to-verify assumptions call for valuation expertise done by independent professionals.

Our findings are consistent with Ding, Richard, Stalowy (2008) research pointing out that accounting treatment for goodwill presents the shift from a stakeholder model to shareholder model, which leads to the preference for short-term rather long-term profit. The move to actuarial solution was judged by the assumption that financial reports should provide data more close to market values, and therefore more useful to investors. The observation of no impairment write-offs even the acquired operations have declined, stands for the short-term demand for dividends. Also Z. Krizova, J. Sedlacek, and E. Hyblova (2012) conducted an analysis of goodwill disclosure made by Czech enterprises and obtained similar results pointing out that companies fail to comply with simple disclosure requirements. In like manner C. Lee (2011) summarizes his findings concentrated on the ability of goodwill to predict future cash flows. In his article Lee pinpoints the subjectivity of assumptions underlying goodwill measurements.

The presented issues related to the reporting of goodwill translate into additional requirements for the educational process in this regard. The student should possess the ability not only to calculate the goodwill correctly, but also to recognize and interpret areas of intentional treatment of this asset from the point of view of building the image of the financial situation of the entity and the group. Ethical attitudes to the valuation of assets and liabilities are becoming of particular importance, which requires the introduction of moderated discussion to the

educational process on a wider-scale and analysis of case studies on different variants of actions taken by accountants and managers. The student should be sensitive to the fact that, in case of presenting goodwill in the financial report, lack of information or incomplete information can mean the inability of its proper assessment. In case of a significant share of goodwill in assets it could mean the inability to assess correctly the financial position of the entity.

CONCLUSIONS

The history of accounting for goodwill shows that there seems to be no simple way of correcting the contemporary issues referring to accounting for goodwill. It seems that the developed solutions created more difficulties than they solve. Financial information presented by publicly traded companies affects the functioning of capital market, and earnings influence incentives and decisions regarding directions of investments of scarce economic resources. Thus, economists have a real problem to solve in order to ensure that financial reports reflect a realistic economic picture of a business entity. As accounting disclosure should be neutral in presenting the economic facts, ambiguity of choices in financial calculations and presentation shall be limited to achieve the neutrality. Alternatives are available in the area of goodwill valuation and presentation, but the choice of one or the other may produce substantially different results in the statement of financial position and in the statement of comprehensive income. Moreover, comparability of financial statements, elements of assets, liabilities and equity is deteriorated.

To overcome abuses, the creation of precise regulation might not be enough. The willingness by companies to disclose unbiased and understandable information is a must. Because the existence and the value of goodwill mainly depends on the circumstances of the transaction of business combination, accountants should present the economic nature of goodwill proving that the item meets the requirement of an asset, especially regarding its nature and faithful representation of economic phenomena of business combination conducted. The complex nature of economic resources incorporated in the goodwill oblige for broad disclosures and fair explanations. Accountants' awareness is also important in the years following the first valuation of goodwill. Measurement of goodwill done at the time of business combination loses its validity due to the changes in economic situation on the market, strategic decisions made within a company or other variables included in the initial valuation. In order to assure the high quality of economic information delivered by goodwill position disclosed in financial reports during the years following business combinations, financial disclosure referring to changes of estimates and detailed data referring to cash generating units is desired. As goodwill is inseparable to assets of the acquired entity, the information about the cash-generating unit (including changes in revenue and profitability) shall be delivered in order to capture the intangible dimension of the entity. Summarizing, the conducted research suggests that the most important information is missing in financial reports of Polish publicly traded companies: the description of the economic nature of goodwill purchased and the changes in the forecasted economic benefits arising from cash generating unit encompassed in the goodwill.

In authors' opinion, there is a need for more fundamental approach to goodwill instead of arithmetical pursuit mostly manifested in the accounting literature and practice. The change in goodwill presentation would represent a major change in analytical-mathematical bookkeeping, which could have a serious positive impact on the quality of information disclosed in financial reports. Stressing the importance of fundamental and conceptual approach to goodwill will not change any of accounting concepts, axioms or methods at the same time. Of course, there is no warrant for the proposal that all qualitative information would be of high quality securing that financial reports help users form appropriate perceptions concerning intangible dimension of the entity. The awareness of accountants to the need of enhanced disclosure shall be accompanied by ethical awareness referring to the importance of accounting information on the

contemporary capital markets. It is not only about accountants, their ethics, knowledge and competences, but also about investors who attach different valuation weights to various goodwill components of accounting goodwill numbers.

REFERENCES

- Backman, J. (1970). An economist looks at accounting for business combinations. *Financial Analysts Journal*, July-August, 39-48.
- Churyk, N.T. (2005). Reporting goodwill: are the new accounting standards consistent with market valuations? *Journal of Business Research*, 58, 1353-1361.
- Copeland, R.M., & Wojdak, J.F. (1969). Valuation of unrecorded goodwill in merger-minded firms. *Financial Analysts Journal*, September-October, 57-62.
- Ding, Y., Richard, J., et.al., (2008). Towards an understanding of the phases of goodwill accounting in four Western capitalist countries: from stakeholder model to shareholder model. *Accounting, Organizations and Society*, 33, 718-755.
- Financial Reports of Agora S.A. Retrived August 10th, 2015, from http://www.agora.pl/agora_english/0,113314.html#TRNavSST
- Financial reports of TVN S.A. Retrived August 8th, 2015, from <http://investor.tvn.pl/en/publications-financial-reports/>
- Financial Reports of Wirtualna Polska S.A. Retrived August 27th, 2015, from <http://inwestor.wp.pl/en/publications/press-releases/>
- Glaum M. & Wyrwa S. (2011). Making Acquisitions Transparent. Goodwill Accounting in Times of Crisis. retrived December 4th, 2012, from www.pwc.com/ie/pubs/2011.
- Hirschey, M. & Richardson, V.J. (2002). Information content of accounting numbers. *Journal of Accounting and Public Policy*, 21, 173-191.
- Hoogendoorn, M. (2000). A Financial Statement Model Based on Shareholder Value. Retrived January 3rd, 2013, from www.imwww.fee.uva.nl/-pv/PDFdocs/2000-04.pdf.
- Ignatowski, R. (2003). Przewodnik po konsolidacji sprawozdań finansowych. Gdańsk, Poland: ODDK.
- International Accounting Standard 36 "Impairment of assets", Official Journal of the European Union, L 346/38, 20.12.2013.
- International Financial Reporting Standard 12 "Disclosure of interests in other entities", Official Journal of the European Union, L 312/1, 21.11.2013
- International Financial Reporting Standard 3 "Business Combinations", Official Journal of the European Union, L 149/22, 12.6.2009.
- Kamela-Sowińska A. (1996). Wartość firmy. Warszawa, Poland: PWE.
- Knortz, H.C. (1970). The realities of business combinations. *Financial Analysts Journal*, July-August, 28-32.
- Kripke, H. (1968). Accounting for corporate acquisitions and the treatment for good will: an alert signal to all business lawyers. *The Business Lawyer*, 24., 89-98.
- Krizova, Z., Sedlacek, J., et.al. (2012). Disclosure of goodwill in mergers & acquisitions. Carpathian Logistic Congress, Lázně Priesnitz, Jeseník, the Czech Republic.
- Kumor, I. & Strojek-Filus, M. (2013). Przekształcenie sprawozdania finansowego w procesie ustalania wartości jednostki gospodarczej. *Zeszyty Naukowe Uniwersytetu Szczecińskiego*, 786, 193-202.
- Lee, C. (2011). The effect of SFAS 142 on the ability of goodwill to predict future cash flows. *Journal of Accounting and Public Policy*, 30, 236-255.
- Myers S.C. (1977). Determinants of Corporate Finance. *Journal of Financial Economics*, 5 (2), 148.
- Nobes, Ch. & Norton, J. (1989). International variations in the accounting and tax treatments of goodwill and the implications for research. *Journal of International Accounting, Auditing & Taxation*, 5, 179-196.
- Strojek-Filus, M. (2012). Wycena udziałów niekontrolujących w skonsolidowanym sprawozdaniu finansowym. In H. Buk (ed.), *Wycena zasobów gospodarczych dla potrzeb sprawozdawczości finansowej*, (p. 153). Katowice, Poland: Wydawnictwo Uniwersytetu Ekonomicznego Katowicach.
- Strojek-Filus, M. (2013). Determinanty oraz skutki wynikowo-bilansowe identyfikacji i rozliczania wartości firmy w grupie kapitałowej. Katowice, Poland: Wydawnictwo Uniwersytetu Ekonomicznego w Katowicach.
- Tollington, T. (1998). Separating the brand asset from the goodwill asset. *Journal of Product & Brand Management*, 7(4), 291-304.

EFFECTS OF MANAGERS' INDIVIDUAL VALUES ON COMPANY'S PERFORMANCE: THE CASE OF FRANCE

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Abstract. *The values of managers occupy a prominent place in the scientific research. The role played by individual values in decision making within the company is less clear. Despite this attention, this study examines the relationship between managers' individual values and the company's performance. Based on a sample of 1202 French managers, this study aims to explain the system of managers' individual values within the French company SBF120. A questionnaire was sent to 1,202 senior managerial leaders.*

Our results highlight the existence of a positive relationship between the individual preferences of managers for competence, moral and social values and company's performance. This study should have academic and practical contributions particularly for managers seeking to improve the companies' practices and organizational functioning within capital market economy.

Keywords: *Manager, company's performance, individual values, value system, financial crisis.*

Introduction

The recent international financial crises as Enron and World Com, which were manifested in the United States from the year (2001) gradually propagated to all the countries the most developed in the world. Major theoretical and empirical contributions have manifested about the problematic of these crises, interest has focused on the operation of corporate governance to address the problem posed by these events and find an explanation that mitigates the responsibility of financial institutions managers. The values thus obtained great importance to the scene of crises and different pressures (especially societal) that companies face their duties and roles of their managers. These values require more transparency and communication inside the company with employees and outside the company with the society, while companies seek to improve the degree of control and empower executives to achieve the company's goals.

These crises have shown the shortcomings of control mechanisms and of the current system of corporate governance. Several countries such as France, Germany, the UK and others have taken measures to strengthen accountability of the manager as part of improving their corporate governance systems through the adoption of new laws, creating long-term security mechanisms advance shareholder democracy and employee participation in governance, applying new standards and establishing guidelines for increasing the expectations and responsibilities of managers. Some laws have been adopted by states in response to these requirements, so we find that these countries are focused on one main goal is to create regulations requiring managers to account for their activities and on the control and monitoring function and their impact on the company.

For this purpose, our study would be interesting to address an essential dimension of management and corporate governance, namely the manager's values in the company. The main

objective is focused to study this dimension based on the level of business performance in the French context.

Our problem will be particularly understand to what extent and with what impact are the individual values of managers that can influence the performance in French companies?

The structure of this study is like the following: first we present a review of the literature on the one hand the values generally, and on the other hand the individual values of manager within the company. Second, we will justify our methodological choice and the choice of our samples in terms of size and in a way which we collected data. Finally, we show an analysis of the obtained results followed by the brought contributions and the various limitations of this research.

Literature Review

The concept of individual values within the company.

The discussion about the values is also old as companies themselves. Although they are not new, they have received a lot of pressure in the last five to seven years in several areas of scientific research, mainly because of the scandals which appeared around the ethical behavior of the company managers. They are among the very few social concepts that have been used successfully in all disciplines of the social sciences, and Ball-Rokeach Rokeach (1989). For example in marketing this concept takes a special importance because of its direct link with consumer attitudes. In this context the behavior of individuals is impacted well by its values, in particular their reactions in front of marketing stimuli or their choice of products, bound for example to how to feed, to get dressed or of mode of transport movements.

At the organizational level, Schein (1985) consider the values as a major component of organizational culture, and are often described as principles responsible for the management success of a number of companies. But in spite of their big importance, there is no total agreement on the nature of values themselves. They were considered as needs, types of personality, motivations, objectives, public services, attitudes and interests. According to Rokeach and Bill-Rokeach (1989) the lack of agreement has created problems in interpreting the results of various studies and how the values are conceptualized, defined and measured in academic research.

The values are difficult to define because they share similar characteristics with concepts such as attitudes, preferences and opinions. In the literature there are several definitions of values. According to Rokeach (1973) values are defined as lasting beliefs leading a specific behavioral style or end state of existence that is better than another style of behavior. According to him this concept should take of specific importance in all sciences studying individual behavior.

The literature on theories of values (Schwartz and Bilsky, 1990; Rokeach and Ball-Rokeach, 1989; Elects 1996) focuses on the stability of the values and their structure. Schwartz (1994) argues that the values are structured by a combination of social and psychological conflicts. Over time, these conflicts and harmonies between the value priorities translate into a structure or system of values. It states that the differences between the structures of values explain the individual behavior and the impacts in terms of decision making. To identify the different definitions of individual values, three main theoretical contributions can be retained: Studies of Rokeach (1973) indicated RVS (Rokeach's value survey) approach Kahle (1983) and that of Schwartz and Bilsky (1987).

Rokeach's Approach

By the late 1960s, Professor of Psychology at the University of Michigan Milton Rokeach developed a special interest faces human values. « Sustainable beliefs determining a specific behavior mode (or aim of existence) is personally or socially preferable to another mode of behavior (or opposite or converge aim of existence) ». Within the framework of his approach, values are based on the following five principles:

1. The total valuable number which a person possesses is relatively small;
2. Every individual possesses the same values in various degrees;
3. The values are organized in systems;
4. The antecedents of human values come from the culture of the society and its institutions and personality;
5. The consequences of human values are manifested in almost all the phenomena studied in social sciences.

Specifically, he has developed a measurement scale named the Rokeach Value Survey (RVS) to assess the system of individual values. He has classified the values into two types. First of all, the terminal values which refer to the personal values or to the social values. According to him this valuable type refers to beliefs or ideas about personal goals or purpose of existence for example, collaboration (colleagues of work help each other); motivation (have a rich professional life); autonomy (having the ability to choose their own work objectives); satisfaction (have a good emotional state resulting from job satisfaction) and social recognition (see appreciated contribution to its just value).

The seconds are instrumental values that refer to beliefs or ideas on desirable patterns of behavior. These values refer to the values of competence or moral values, such as, Independence (have freedom of action and thought at work); responsibility (answering the requirements defined in the course of your duties); utilitarianism (act so as to maximize the global well-being of all stakeholders); the helpful (always ready to do service to stakeholders) and intelligence (to have the ability to act appropriately to situations). Figure 1 shows the system of individual values Rokeach (1973) and Table 1 shows all the individual values into two lists (18 terminal values and 18 instrumental values).

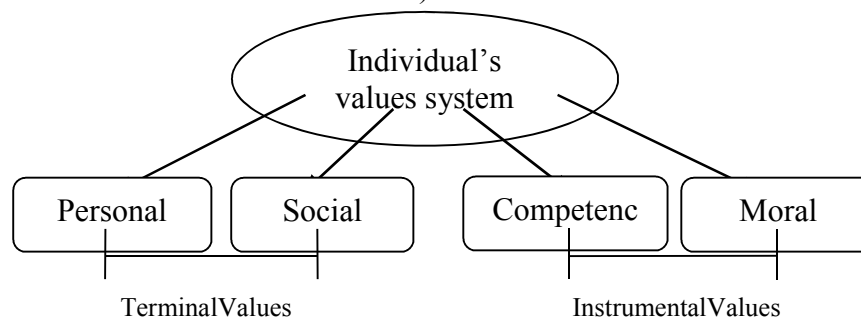


Figure 1: Individual's Values System of Rokeach (1973)

Table 1: Individual's Values of Rokeach (1973)

Terminal values	Instrumental values
A comfortable life (a prosperous life)	Ambitious (hard-working, aspiring)
An exciting life (a stimulating, active life)	Broad-minded (open-minded)
A sense of accomplishment (lasting contribution)	Capable (competent, effective)
A world at peace (free of war and conflict)	Cheerful (lighthearted, joyful)
A world of beauty (beauty of nature and the arts)	Clean (neat, tidy)
Equality (brotherhood)	Courageous (standing up for your beliefs)
Family security (taking care of loved ones)	Forgiving (willing to pardon others)
Freedom (independence, free choice)	Helpful (working for the welfare of others)
Happiness (contentedness)	Honest (sincere, truthful)
Inner harmony (freedom from inner conflict)	Imaginative (daring, creative)
Mature love (sexual and spiritual intimacy)	Independent (self-reliant, self-sufficient)
National security (protection from attack)	Intellectual (intelligent, reflective)
Pleasure (an enjoyable, leisurely life)	Logical (consistent, rational)
Salvation (saved, eternal life)	Loving (affectionate, tender)
Self-respect (self-esteem)	Obedient (dutiful, respectful)
Social recognition (respect, admiration)	Polite (courteous, well-mannered)
True friendship (close companionship)	Responsible (dependable, reliable)
Wisdom (a mature understanding of life)	Self-controlled (restrained, self-disciplined)

Kahle's Approach

Further to the work of Rokeach (1918-1988) which was based mainly on American society, Kahle has also studied the values to ensure their universality. However, his scale is a more condensed form as the Rokeach; values are person-oriented while those of Rokeach are more oriented to the society.

Specifically, Kahle present a list of nine values (L.O.V) terminal purely as follows:

- Sense of belonging;
- The need for excitement;
- The amusement and joy of living;
- Warm relationships with others;
- Personal fulfillment;
- Sense of accomplishment;
- Being well respected;
- Security;
- Self-respect.

The set of these values are person-oriented while those of Rokeach (1973) are instead oriented towards society. Furthermore, the first six values Kahle are internal because they are from the individual while the last four are external values. This scale is widely used in academic work in management, especially in marketing. Its advantage is presented by a small number of values and its possibility of use during questionnaire surveys (in terms of greater acceptance of the individual questionned and time saving). By cons, its main drawback present in the fact that measured values list does not present the difference of individual's values.

Schwartz & Bilsky's Approach

The approach of Schwartz and Bilsky (1987) is based primarily on the works of Rokeach. According to this approach the values have played an essential role not only in sociology, but also in anthropology, psychology and in the other concerned disciplines. We use them to explain the individuals or the companies, to follow the change over time, and to develop the purposes through our attitude and behavior.

According to Schwartz and Bilsky (1990), individual values answer to the following definition:

- These are concepts or beliefs that are related to the goals of the existence or desirable behavior,
- They go beyond the specific conditions and are the conclusion of incentives designed to achieve personal goals,
- They guide the choices and allow the assessment of behaviors and events,
- They are ordered in order of relative importance as guiding principles of life.

These values answer three needs (the first one at the individual level is the biological need, the second is the need for a granted social interaction and the third one is the need for survival and for well-being within the groups). Furthermore, Schwartz developed Rokeach Values Survey (RVS) by increasing the number of values compared to achieve fifty six values categorized in eleven domains which are: the auto-orientation; stimulation; hedonism; fulfillment; power; security; conformity; tradition; spirituality; benevolence; universalism. This instrument set up to measure the values presented under the name of questionnaire of the values of Schwartz (Schwartz Value Survey), Schwartz (1992).

Effects of individual values within the company.

As previously indicated, the values have been conceptualized in different ways. To handle more clear, the research led by Rokeach (1973) and Williams (1968) focused on two types of values. A type where the value of individual attributed to an object or result. These objects or results

acquire value through their instrumental relationship with other objects or results which, in turn, play a role determining to other objects or results.

A second type of value that is more likely to be used to describe a person, Feather (1995). These values were divided into instrumental and terminal values, Rokeach (1973). Terminal values, for example, a comfortable life, wisdom ... etc. As its name indicates, on the other hand the instrumental values are modes of behavior, eg, honesty, helpfulness ... etc. In this context Rokeach proposed a functional relationship between the two values (instrumental and terminal) in which the instrumental values describe behaviors that facilitate the achievement of the final values.

In our study, we are going to concentrate on the values applying to individuals and not on the values granted to objects or results. On this occasion, we rely on the ideas of Rokeach (1973) and Williams (1968), who argue that this approach is more effective for social analysis, because it can provide a better understanding of individual value and their impacts within the company.

Empirically, research on values provided important indications at the individual, organizational and societal. One of these domains is to know how the individual values of managers influenced the decision-making on human resources (HR). This type of research is mainly based on the idea that values can provide solid explanations behavior. A vast literature now exists, confirming the influence of values on individual behavior in groups, organizations and society. At the analysis of the group, Earley (1993) found that the degree of collectivist values displayed by a group had an impact on individual contributions to the group; On the other hand at the organizational level, Finegan (2000) noticed that the emotional values of an organization will influence significantly the emotional commitment of the employees within this organization, while at the societal level, Hofstede (1980) seminal work notes the valuable importance in the explanation of the productivity of countries.

However, McGuire D. and al. (2006) studied the relationship between individual values of human resource managers (HR) and decision making based on data collected from Canadian and Irish business managers. These questionnaire data were collected from a total of 340 executives. The results showed a positive and significant relation of the importance of health and safety values in a decision-making scenario. They also underline the necessity of examining simultaneously the individual values and the organizational factors as the predictive factors for the made of good decision in human resources. Finally, this study highlights the attention on the necessity of the awareness of effects of individual values which will allow improving the understanding of the process of decision-making within companies.

Begley and Boyd (2000) determine that the individual values must be taken into consideration in the development of human resources policies and strategies leading to greater consistency in organizational decision-making and work environment more harmonious. Similarly, Ranney and Carlson (1992) argue that human resource policies of an organization, individual values and rules are good indicators of human behavior. The study showed that values played an important role in the process of decision making.

Based on a sample of fifty managers, Agrawal and Krishnan (2000) examined the relationship between managerial values and leadership style in the company. They found that managers who care higher functions give more importance to the system of individual values that managers who care for lower functions in the course of their company. The results show that the managers who care of superior functions gave a classification clearly upper to the value of safety and benevolence and a reduction in classification in the value of the self-direction. The leadership style was significantly bound to the value of success and the benevolence.

At the organizational level, certain numbers of studies have shown that companies with high standards of ethical behavior, shared values, and a sense of social purpose are outperforming their counterparts. This can be attributed to the fact that there is a focal point, or

a hierarchy of common values around which decisions can be made and that these decisions are made in a coherent way.

In addition, Reynaud and al. (2008) performs research conducted with 2,728 management students in 22 countries on 4 continents (America, Asia, Europe and Oceania) using the scale of values Schwartz (1992) to analyze the individual values of managers and their attitude with regard to environmental and social responsibilities. This study showed that the values of individualism on the one hand and universalism of the other are closely linked with the responsible attitude. Furthermore, individualism is negatively related to the attitude in environmental and social consideration when universalism is positively related to these two attitudes.

The influence of individual values exerted by financial investors regarding investment of companies has been the subject of several studies also, as the article BOYS (2003) examines the effects of ethical activism about the companies and seeking to determine the relationship between the presence of different types of institutional investors in the capital of a company and its ethical behavior. The latter, concludes that institutional investors, particularly collective investment and the passive investors influence negatively on the ethical behavior of companies.

The recent article by Carlin and Gervais (2009), analyzes how the values of the companies managers affects the employment contracts, the degree of risk, the potential for growth and organizational structure. It also shows that bureaucratic enterprises whose growth potential is low are more likely to win the values of management diligence, and that companies are hiring from a virtuous agent pool, are more conservative in their investments and a horizontal structure of the company. It also shows that some agents are virtuous and provide efforts without referring to additional incentives. Another article by Jeffrey R. Brown et al. (2007) shows that there is a relationship between the participation of the individual in the stock market and the values .A person is more likely to participate in the stock market when a higher number of people in their local environment perform the same decision, In other words, they share the same ethical values.

Aristotle (2004) proposed that individuals of a civilized society incorporate the values in the decisions they make. Similarly, Akerlof (2007) suggests that social values can affect the economy by the effect on the choices people make.

This interaction between incentives and social or moral pressure has been studied in the fields of psychology, Juge and Ilies (2002), political sciences, Rose-Ackerman (1999), and the economy, Frank (1987) and Sen (1987). The common idea in all this literature is that individuals are both guided by moral values that motivate selfless acts.

In this way, the manager's values encourage the efficient functioning of their organizations and influence finally its general culture, Dickson et al. (2001). By supporting these arguments, Schminke et al. (2005) find that the manager's values positively influence the ethical climate of organizations and the moral values of this last form the overall value of the company structure.

In auditing Karacaer S. and al (2009) studying the effects of personal values on ethical decision making of the listener in two countries, namely, Pakistan and Turkey. They conducted the study with a sample of professional auditors and certified in these countries to assess their preferred values using the Rokeach Value Survey (RVS). This study found no statistically significant difference between the average values of moral intensity in both countries. On the other hand, it showed statistically significant differences between the terminal values and instrumental values of auditors in the studied countries. Finally this study asserted that contextual factors, such as organizational or professional values, have a significant impact on behavior in the context of the business, and the importance of the presence of of the very strong professional standards regarding audit to improve the behavior of auditors.

This basic empirical research indicates that there is a significant relationship between the individual manager's values and decision making. The individual values have become prerequisites for effective leadership in modern organizations. Ethics, leadership and values have received much attention. The individual values explained, to some extent, a series of decisions and style of management in the company. However, business managers have to make decisions not only taking into account the benefits they bring, but also how they affect other people, Stansbury J. (2009). The best managers must know their values and ethics in their leadership style and actions. It is necessary to provide full and accurate information, where there is a personal obligation, professional, ethical or moral to perform these actions.

We can conclude that the individual values have long been associated with individual behavior when decision making. The potential influence of these values on decision making and behavior was found in the empirical literature Frederick and Weber (1987); Hunt and al (1989) and Rokeach, (1973). However, there is little empirical links between values and business performance. One reason for this limited number of research could be the lack of full agreement on the nature of values themselves. In addition, there are relatively few studies on the values in the literature of accounting and finance. What was led to questions through this article on the influence of individual manager's values on the overall performance of the company.

Research Methodology

According to the explanatory and causal nature of our problem of research based on the study of themanagers' individual values in the French companies context, we are in a positivist paradigm which is going to allow us to explain generally the different values of managers as well as the link of causality between these values and the company's performance. Based on both theoretical and empirical research, this study aims to investigate empirically managers' individual values using the Rokeach Value Survey (RVS).

Sample and data collection

Our initial sample contains 120 companies quoted in stock exchange. We chose the most important companies component stock index SBF120¹ in France. For the data collection, questionnaire data was collected from a total of 1,202 managers of highest managerial level (for example, the Chief Executive Officer (CEO) of the company, the chairman of the board of directors, the directors of the board ... etc.). In the end, we got 93 valid responses to this survey. Table 2 shows the demographics profile of participants.

¹This is a stock market index for large French companies traded, it is composed of three major indexes are: CAC40, CAC Next 20 and CAC Mid 60.

Table 2: Demographics profile of participants (in percentages)

Demographics	%
Gender	
Male	93
Female	07
Age	
(30-39)	04
(40-49)	13
(50-59)	21
(60-69)	56
(70 et plus)	06
Highest degree	
Universities	05
MBA	15
Business schools	55
Engineering schools	20
Other	05
Level of management	
Top management	83
Middle management	18

Hypothesis

From our objective of this study, we test the following two hypotheses concerning of managers' individual values. On a side the instrumental values of manager and on the other side the terminal values of manager.

The following assumptions refer to the structure of the value system of Rokeach (1973) with the classification of Weber (1990) has developed a classification system that category each Rokeach values (1973). Instrumental values as moral values or skills and terminal values as personal or social values. The first hypothesis refers to the instrumental dimensions of Rokeach values (1973) test the impact of two categories of instrumental managers values (instrumental values of competence and instrumental values of morality) on the company's performance. So we can present the following hypothesis:

Hypothesis 1: The instrumental values of managers are linked to company performance.

H1.1: There is a positive relationship between the individual preferences of managers for competence values and company performance.

H1.2: There is a positive relationship between the individual preferences of managers for moral values and company performance.

The second hypothesis refers to the dimensions of the terminal values Rokeach (1973) test the impact of two categories of personal and social manager terminal values on the company's performance. We can suggest the following hypothesis:

Hypothesis 2: The terminal values of managers are linked to company performance.

H2.1: There is a negative relationship between the individual preferences of managers for personal values and company performance.

H2.2: There is a positive relationship between the individual preferences of managers for social values and company performance.

Choice and definition of variables

The performance of the company:

The notion of performances of the company can be approached through its results, of highly-rated one financial result and accountants and on the other side stock-exchange results. Several ratios based on the data financial and accounting can calculate the financial performance such as, the ratio ROA "Return On Assets" who calculated from the net income divided by the total of the assets of the company; Daines (2004), Adam and Santos (2005), Eisenberg and al (1998), Lazarides and al (2009); and the ratio ROE "Return On Equity" which equals in the net income divided by the book value of own capital, Bouri and Bouaziz (2007), Brown and Caylor (2004), Lehman and Weigand (2000).

These indicators present limits and none of them allow to approach in a single calculation the performance of the company. Consequently, we are going to study the other indicators, which base itself on the market information of the company to know the Q ratio proposed by Tobin in (1969) who corresponds to the market values who equals in own capital more the financial debts of the company and total conversed by the cost of replacement of assets. We thus chose to measure the performance of the company through these two variables sets (ROA&Q ratio proposed by Tobin).

Managers' Individual Values

The research is divided on the appropriate way to measure the values. For example, England (1975) and Wollack and al (1971) using methods that measure the values independently of each other. Others, such as, Cable and Juge (1996), Meglino, Ravlin and Adkins (1989) used methods for assessing preferences between different values. Although there are several classifications of theoretical values the most known and applied method of measuring value is assigned to Rokeach (1973). Most studies on the values in accounting and management used the Rokeach Value Survey (Rokeach Value Survey) in 1973, and there are many empirical studies support the validity and reliability of RVS (for example, Shafer and al, 2001; Wilson and al 1998; Wright and al, 1997).

This instrument, which has been widely used in the study of values for its development contains two lists of 18 terminal values and 18 instrumental values. Two measures of individual values were obtained using the measurement scale values proposed by psychologist Milton Rokeach (1973). Terminal values scale and instrumental values scale. The values in the two scales were presented before in Table 1. Rokeach used a ranking system where each respondent rated 18 values on a scale by order of importance.

However, Weber (1990) developed a classification system that category each Rokeach values (1973). Instrumental values as moral values or skills and terminal values as personal or social values. This classification system is presented in Table 3.

In the end, we asked the managers of French companies assess each value on a scale of 7 following:

1. Opposed to my values
2. Not important
3. Low importance
4. Moderately important
5. Important
6. Very important
7. Essential

Table 3: Weber's Classification of Rokeach's values (1990)

<i>Panel A: Classification of Terminal Values</i>		<i>Panel B: Classification of Instrumental Values</i>	
Variable	Classification	Variable	Classification
A comfortable life	Personal	Ambitious	Competence
An exciting life	Personal	Broad-minded	Competence
A sense of accomplishment	Personal	Capable	Competence
A world at peace	Social	Cheerful	Moral
A world of beauty	Social	Clean	Moral
Equality	Social	Courageous	Moral
Family security	Personal	Forgiving	Moral
Freedom	Personal	Helpful	Moral
Happiness	Personal	Honest	Moral
Inner harmony	Personal	Imaginative	Competence
Mature love	Personal	Independent	Competence

<i>Panel A: Classification of Terminal Values</i>		<i>Panel B: Classification of Instrumental Values</i>	
Variable	Classification	Variable	Classification
National security	Social	Intellectual	Competence
Pleasure	Personal	Logical	Competence
Salvation	Personal	Loving	Moral
Self-respect	Personal	Obedient	Moral
Social recognition	Personal	Polite	Moral
True friendship	Personal	Responsible	Competence
Wisdom	Personal	Self-controlled	Neither

The variables of control: we use in our study the variable of control susceptible to have an impact on company's performance.

The size of the company: in the literary men the influence of size of the company on the performance is contradictory. In (2007), Poulain-Rehm asserts that there is no significant relation between these variables while Cheffoul (2009) shows that the size of the company, impact negatively the performance. However, Crepon and al. (1998) Show a positive and significant influence between both variables. Size of the company: the logarithm of the total of the assets of the company.

Empirical results and discussion:

First, we present through Table 4 the average scores and ranking of values of the Rokeach Value Survey (RVS) in the countries studied (in France). The data presented in this table show many differences in the results of the terminal and instrumental values. For example, intelligence; enthusiasm; courage; responsibility and honesty were among the five most recorded instrumental values. Similarly, the reliability; coherence; pleasure; motivation and satisfaction were assessed as the five highest residual values. One of the interesting findings is that instrumental values ambition; independence; rationality; indulgence and helpful were among the lowest values. Furthermore, the table also shows that the conformability; the stability of careers; respect for tradition and altruism were classified among the lowest terminal values. Therefore, we find differences in preferences of company directors for testing against the values of importance realized by Rokeach in 1973.

Table 4: Mean value ratings and value ranks (N=92)

Instrumental values	Mean	SD	Rank	Terminal values	Mean	SD	Rank
Cheerful	6,4	0,727	1	Pleasure	6,37	0,722	1
Intellectual	6,27	0,891	2	A sense of accomplishment	6,24	0,869	2
Courageous	6,18	0,937	3	A world at peace	6,23	0,973	3
Responsible	6,17	0,872	4	Inner harmony	5,88	0,837	4
Honest	5,97	1,094	5	Happiness	5,86	0,921	5
Self-controlled	5,93	1,23	6	Freedom	5,83	1,034	6
Broad-minded	5,93	0,823	7	Family security	5,57	0,746	7
Imaginative	5,87	0,986	8	Wisdom	5,55	1,062	8
Capable	5,76	0,856	9	Equality	5,38	1,397	9
Independent	5,73	0,973	10	Social recognition	5,38	1,283	10
Ambitious	5,61	0,901	11	National security	5,23	1,335	11
Logical	5,39	0,96	12	A comfortable life	5,02	1,317	12
Forgiving	5,32	1,414	13	A world of beauty	4,97	1,346	13
Polite	5,11	0,955	14	Mature love	4,88	1,156	14
Clean	5,08	0,986	15	Salvation	4,71	1,075	15
Loving	4,72	0,894	16	An exciting life	4,6	1,375	16
Helpful	4,62	1,067	17	True friendship	4,41	1,549	17
Obedient	4,6	1,187	18	Self-respect	4,28	1,009	18

Regarding consistency or reliability of our values tested Cronbach's alpha for our scale was as follows:

Managers' individual values	Cronbach's Alpha
Instrumental values	
Competence	,673
Moral	,763
Terminal values	
Social	,833
Personal	,877

The Cronbach's alpha can take multiple values. Its value is between 0 and 1. Most scientists agree on a minimum value equal to 0.7 for the test to be considered reliable, others set the value to get at least 0.8.

In addition, we have verified that no correlation was also higher than 0.80 between the interactions of the variables studied. The results of the correlation matrix obtained and presented in Schedules 1, 2.3 and 4 at the end of this study, we reveal that there is an absence of strong correlations between the interactions of four groups of the centered values.

Then, we verified that there is no multi collinearity problem. We noticed that the variables have a value of VIF "Variance Inflation Factor" ranging from 1.000 to 1.002, well below the standard values (VIF <3.3). In addition, the test statistic Durbin-Watson (used to detect autocorrelation in the residuals from a linear regression) shows a value of 1.565 which is well within the range of zero to four. A value close to zero indicates a positive autocorrelation, values located around 2 show an autocorrelation absence and if we approach 4, there is a negative autocorrelation. The following table summarizes the results of these tests.

	Durbin-Watson	Collinearity Statistics	
		Tolerance	VIF
Competence Values	1,967	,998	1,002
Moral Values	1,556	1,000	1,000
Social Values	1,958	,998	1,002
Personal Values	1,565	1,000	1,000

Regarding the results of the regression analysis that examines the relationships of all variables with the company's performance. Tables 5 and 6 present the summary of these results.

Table 5: Results of regression analysis (ROA)

Variable	R	R ²	Adjusted R-squared	Beta	T	Sig.
Instrumental values						
Competence	,593	,351	,337	,266**	3,116	,002
Firm size	-	-	-	-,543**	-6,349	,000
Moral						
Firm size	,579	,335	,320	,234**	2,71	,008
	-	-	-	-,531**	-6,15	,000
Terminal values						
Social	,579	,335	,320	,233**	2,689	,008
Firm size	-	-	-	-,518**	-5,989	,000
Personal						
Firm size	,591	,349	,335	,262**	3,065	,003
	-	-	-	-,527**	-6,158	,000

*p<0.05. ; **p< 0.01.

Table 6: Results of regression analysis (Q Tobin)

Variables	R	R ²	R-deux ajusté	Beta	T	Sig.
Instrumental values						
Competence	,386	,149	,130	,207*	2,112	,037
Firm size	-	-	-	-,543**	-6,349	,001
Moral						
Firm size	-,401	-,161	-,142	-,234*	-2,409	,018
Firm size	-	-	-	-,328**	-3,378	,001
Terminal values						
Social	,366	,134	,115	,167	1,687	,095
Firm size	-	-	-	-,318**	-3,221	,002
Personal	,384	,148	,129	,203*	2,079	,041
Firm size	-	-	-	-,324**	-3,309	,001

*p<0.05. ; **p< 0.01.

As regards the first hypothesis H1.1, there is a positive relationship between the individual preferences of managers for the values of competence and performance of the company, Tables 5 and 6 we learn that it is broadly confirmed. Indeed, all skill values are positively related to performance of company, it is more the individual preferences of managers to increase the values of responsibility, independence, rationality, imagination, ambition, broad-mindedness, competence and wiser now achieved a good overall performance. This result affirms the argument found in studies of Frederick and Weber (1987) and Hunt and al (1989) where individual values are associated strongly to individual behavior at the time of decision making that could improve the performance and creation values in the company.

Then, with respect to the hypothesis H1.2, there is a positive relationship between the individual preferences of managers for moral values and business performance, the results confirm this argument. In this way, the moral values of the managers (excitement, elegance, courage, forbearance, utilitarianism, honesty, helpfulness, obedience and compliance) promote the efficient operation of their organizations and ultimately influence their overall returns. By supporting this argument, Schminke and al. (2005) also find that the values of managers positively influences the ethical climate of organizations and the moral values of these, form the overall value of the company structure.

Finally, as regards the second hypothesis, which refers to the terminal dimensions values of managers test the impact of these two categories of personal and social values on the performance of the company, Tables 5 and 6 show that there is a positive relationship between the individual preferences of managers for social values (reliability, stability careers, justice and equality) and company performance. Then, our study does not confirm the hypothesis H2.1 where it is assumed that there is a negative relationship between the individual preferences of managers to personal values and corporate performance.

Compared to our control variable, our results show that firm size is an important determinant of the company's performance. Tables 5 and 6 show that there is a negative relationship between the two variables. These results are consistent with our expectations and validate those identified in previous research as Cheffoul (2009) which states this relationship.

Overall, we can conclude that our main assumptions are confirmed, since we find that the more the individual preferences of managers for the values of competence, moral and social are high, also the company's performance level. The research results obtained are similar to many empirical studies in the academic literature as Jeffrey R. Brown and al. (2007), Aristotle (2004), Akerlof (2007), Rose-Ackerman (1999), Frank (1987) and Sen (1987). This basic empirical research indicates that there is a significant relationship between the individual values of leadership and decision-making, which subsequently positively impact the overall performance of the company. In addition, individual values have become prerequisites for effective leadership in modern organizations. We can conclude that the individual values of the managers globally prominently in major French companies.

Contributions and Limitations

This study may have several contributions to both academic and practical implications for different reasons. From an academic perspective, our study was interested to deal with an essential dimension of management and corporate governance, namely the individual values of leadership in French companies. These values obtained a big importance in front of these crises and different pressures (especially societal) that companies face their duties and roles of their managers.

Unlike previous research, our research establishes an important empirical analysis to improve managerial practices, as well as explanation of link of the causality between the values of leader and the general performance within the French companies. We chose companies making up most important stock index in France SBF120. A questionnaire was sent to a final sample consists of 1202 high-level managers managerial.

This study also has practical implications, because it allows a better understanding of individual values of company's managers, as well as a link explaining the causality between these values and performance within large French companies. This can provide useful information for the professionals which are company's managers or financial institutions at the time of decision-making and more effective strategic choices. However, our study also has some limitations that may constitute important research avenues for further work. The most important is related to the size of the sample that we have represented the French context by the companies making up the most important stock index in France SBF120 which certainly are large companies in France, but would be important to have other French companies of different sizes. Thus, as part of future work, it would be interesting to enlarge the sample by including other managers of European companies, which would have a more developed vision of the European context.

Conclusion

Since the late 1990s, the managers have faced increasing demands from one side of the part of financial and accounting markets, but also from various internal and external stakeholders increasingly influential. These requirements put the leader in an awkward position because he is asked the latter to give more effective strategic choices, allowing the company to live and develop in an uncertain and complex environment. They seek to find a model of responsibility

on which they will rely upon decisions to try to reduce the unpredictability and uncertainty in which they are located.

The main objective of this study is to better explain the system of individual values of managers within the company, and then we study the impact of these values on the performance of French companies. We chose the most important component stock index SBF120 companies in France. A questionnaire was sent to 1202 senior managerial managers. The results show that over the individual preferences of managers for the values of competence, moral and social are high; also the company's performance level is high.

References:

- Argrowal, T., & Krishnan, V.R. (2000). Relationship between Leadership Styles and Value Systems. *Management and Labour Studies*, 25 (2), 136-143.
- Akerlof, George A. (2007). The missing motivation in macroeconomics. *American Economic Review*, 97, 5–36.
- Begley, T.M., & Boyd, D.P. (2000). Articulating Corporate Values Through Human Resource Policies. *Business Horizons*, 43 (4), 8-15.
- Bruce I. Carlin & Simon Gervais. (2009). Work Ethic, Employment Contracts, and Firm Value. *Journal of Finance*, 64, 785-821.
- Earley, P.C., (1993). East meets west meets Mid East: Further explorations of collectivistic and individualistic work groups. *Academy of Management Journal*, 36, 319-348.
- Feather, N. T., (1995). Values, valences, and choice: The influence of values on the perceived attractiveness and choice of alternatives. *Journal of Personality and Social Psychology*, 68, 1135-1151.
- Finegan, J.E., (2000). The Impact of Person and Organisation Values on Organisational Commitment. *Journal of Occupational and Organisational Psychology*, 73 (2), 149-169.
- Hofstede, G., (1980). *Culture's Consequences: International Differences in Work Related Values*. Beverly Hills, CA: Sage.
- Jeffrey R. Brown & al. (2007). Neighbors Matter: Causal Community Effects and Stock Market Participation. National Bureau of economic research.
- Kahle L., (1983). *Social value and social change: Adaptation to life in America*. New York, Praeger.
- Karacaer, S., Gohar, R., Aygün, M. & Sayin, C., (2009). Effects of personal values on auditor's ethical decisions: A comparison of Pakistani and Turkish perofessional auditors. *Journal of Business Ethics*, 88(1), 53-64.
- McGuire, D., Garavan, T.N., Saha, S. & O'Donnell, D. (2006). The impact of individual values on human resource decision-making by line managers. *International Journal of Manpower*, 27, (3), 251 – 273.
- Ranney, G.B., & Carlson, B., (1992). Reviewing Organisational Policies and Rules. *Quality Progress*, 25 (1), 50-56.
- Reynaud, E., Egri, C.P., & Ralston, D.A. (2008). Les déterminants du comportement responsable : Une comparaison internationale à grande échelle. 17ème Congrès annuel de l'AIMS, Nice Sophia Antipolis, mai.
- Rokeach, M., & Ball-Rokeach, S.J.,(1989). Stability and Change in American Value Priorities, 1968-1981. *American Psychologist*, 44, 775-784.
- Rokeach, M., (1973). *The Nature of Human Values*. New York: Free Press.
- Rokeach, M., (1979). *Understanding Human Values: Individual and Societal*. New York: Free Press.
- Schein, E.H., (1985). *Organisational Culture and Leadership*. Jossey Bass, San Francisco.
- Schwartz, Shalom H. & Wolfgang Bilsky (1987). Toward a Universal Psychological Structure of Human Values. *Journal of Personality and Social Psychology*, 53 (3), 550-562.
- Schminke, M., Ambrose, M.L., & Neubaum, D.O., (2005). The effect of leader moral development on ethical climate and employee attitudes. *Organizational Behavior and Human Decision Processes*, 97, 135–151.
- Stansbury, J., (2009). Reasoned Moral Agreement: Applying discourse ethics within organizations. *Business Ethics Quarterly*, 19(1), 33-56.
- Weber, J., (1990). Managerial value orientations: a typology and assessment", *International Journal of Value Based Management*, 3, (2), 37-54.
- Williams, R.M., Jr., (1968). *Values In E. Sills (Ed.), International encyclopedia of the social sciences*. New York: Macmillan.

EFFECTS OF MANAGERS' INDIVIDUAL VALUES ON COMPANY'S PERFORMANCE: THE CASE OF FRANCE

Annex 1: Pearson's Correlation (Competence values)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Ambitious											
2. Broadminded	,173 ,100										
3. Capable	,390** ,000	,368** ,000									
4. Imaginative	,115 ,275	-,227* ,029	,067 ,527								
5. Independent	,253* ,015	,183 ,080	,317** ,002	,535** ,000							
6. Intellectual	,161 ,125	-,095 ,365	-,015 ,889	,166 ,114	,061 ,565						
7. Logical	,293** ,005	,158 ,133	,329** ,001	,124 ,238	,315** ,002	,221* ,034					
8. Responsible	,283** ,006	,292** ,005	,351** ,001	,124 ,178	,483** ,000	,038 ,723	,207* ,048				
9. ROA	,249* ,017	,144 ,170	,195 ,063	,081 ,444	,215* ,039	,09 ,329	,114 ,280	-,031 ,770			
10. Q of Tobin	,260* ,012	,056 ,599	,206* ,049	,097 ,357	,176 ,093	-,053 ,615	,212* ,042	-,134 ,202	,689** ,000		
11. Firm size	-,011 ,919	,052 ,625	,118 ,261	-,088 ,406	-,166 ,114	,079 ,455	,124 ,240	,138 ,191	-,513** ,000	-,321** ,000	

** . Correlation is significant at the 0.01 level. * . Correlation is significant at the 0.05 level.

Annex 2: Pearson's Correlation (Moral values)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1.Cheerful												
2.Clean	,79** ,007											
3.Courageous	,019 ,859	,318** ,002										
4.Forgiving	-,050 ,637	,464** ,000	,287** ,005									
5.Helpful	-,197 ,06	,184 ,078	,192 ,067	-,124 ,241								
6.Honest	-,246* ,018	,522** ,000	,617** ,000	,454** ,000	,272** ,009							
7.Loving	-,178 ,089	,486** ,000	,194 ,063	,367** ,000	,531** ,000	,643** ,000						
8.Obedient	-,282** ,007	,308** ,003	,423** ,000	,135 ,198	,719** ,000	,582** ,000	,710** ,000					
9.Polite	-,206* ,049	-,102 ,332	,112 ,286	-,311** ,003	,699** ,000	,140 ,182	,410** ,000	,738** ,000				
10. ROA	,018 ,864	,156 ,137	,113 ,284	,134 ,202	,219* ,036	,145 ,168	,198 ,058	,164 ,118	,046 ,661			
11. Q of Tobin	-,25 ,816	,133 ,208	,137 ,191	,100 ,345	,183 ,081	,105 ,319	,205* ,050	,221* ,034	,146 ,165	,689** ,000		
12.Firm size	-,005 ,962	-,070 ,509	-,097 ,358	-,133 ,205	,040 ,702	,009 ,929	,094 ,370	,070 ,509	,182 ,082	-,513** ,000	-,321** ,000	

** . Correlation is significant at the 0.01 level. * . Correlation is significant at the 0.05 level.

Annex 3: Pearson's Correlation (social values)

	1.	2.	3.	4.	5.	6.	7.
1.A world at peace							
2. A world of beauty	,366** ,000						
3.Equality	,646** ,000	,532** ,000					
4.National security	,636** ,000	,530** ,000	,677** ,000				
5. ROA	,140 ,182	,158 ,134	,291** ,005	,240* ,021			
6. Q of Tobin	,094 ,374	,166 ,115	,167 ,112	,157 ,340	,689** ,000		
7. Firm size	,013 ,898	-,010 ,922	-,131 ,214	-,014 ,892	-,513** ,000	-,321** ,000	

** . Correlation is significant at the 0.01 level.*. Correlation is significant at the 0.05 level.

Annex4: Pearson's Correlation (Personal values)

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
1. A comfortable life	1																
2. An exciting life	,654** ,000																
3. Accomplishment	,533** ,000	,238* ,023															
4. Family security	,468** ,000	,631** ,000	,400** ,000														
5. Freedom	,705** ,000	,538** ,000	,181 ,084	,243* 0,02													
6. Happiness	,410** ,000	,614** ,000	,455** ,000	,550** ,000	,470** ,000												
7. Inner harmony	-,008 ,943	,111 ,294	-,142 ,178	,162 ,122	,293** ,005	,021 ,845											
8. Mature love	,420** ,000	,681** ,000	,269** ,009	,780** ,000	,267** ,010	,428** ,000	,417** ,000										
9. Salvation	,323**	,440**	,076	,689**	,260**	,280**	,278**	,529**									

EFFECTS OF MANAGERS' INDIVIDUAL VALUES ON COMPANY'S PERFORMANCE: THE CASE OF FRANCE

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
	,002	,000	,472	,000	,012	,007	,007	,000									
10. Self-respect	,681**	,590**	,436**	,559**	,574**	,505**	,353**	,528**	,442**								
	,000	,000	,000	,000	,000	,000	,001	,000	,000								
11. Social recognition	,515**	,474**	,755**	,611**	,208*	,697**	-,111	,468**	,257*	,476**							
	,000	,000	,000	,000	,047	,000	,293	,000	,013	,000							
12. True friendship	-,042	,301**	,277**	,576**	-,188	,311**	,089	,482**	,542**	,339**	,473**						
	,690	,004	,008	,000	,073	,003	,397	,000	,000	,001	,000						
13. Wisdom	,266*	,703**	,045	,432**	,269**	,238*	,125	,439**	,269**	,273**	,134	,333**					
	,010	,000	,668	,000	,010	,022	,236	,000	,009	,009	,203	,001					
14. Le plaisir	,015	,086	-,09	,077	,190	,046	,438**	,119	,425**	,247*	-,13	,216*	,059				
	,89	,421	,394	,464	,069	,661	,000	,257	,000	,017	,218	,039	,573				
15. ROA	,229*	,155	,266*	,164	,269**	,176	,192	,181	,148	,257*	,080	,051	,185	,109			
	,028	,139	,011	,119	,010	,093	,066	,850	,016	,013	,448	,631	,077	,303			
16. Q of Tobin	,130	,204	,120	,195	,180	,181	,166	,255*	,043	,186	-,032	,032	,199	,04	,689**		
	,216	,051	,255	,062	,086	,084	,113	,012	,684	,076	,759	,673	,057	,706	,000		
17. Firm size	-,025	-,036	-,053	,101	-,119	,044	-,097	,053	-,053	,056	,146	,095	-,189	-,127	-,513**	-,321**	
	,815	,732	,614	,336	,259	,674	,359	,615	,616	,593	,164	,369	,072	,229	,000	,000	

** . Correlation is significant at the 0.01 level. * . Correlation is significant at the 0.05 level.

RESPONSIBILITY OF CORPORATE MANAGER: TO SYNTHESIZE OF THE DIFFERENT THEORIES BY ECONOMIC, POLITICAL, SOCIAL AND BEHAVIORAL PERSPECTIVES

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Abstract. *Following the high profile financial scandals of 2007-2008, corporate management has been faced with strong pressures resulting from more regulatory requirements, as well as the increasing expectations of various groups of stakeholders. The responsibility acquired a big importance in front of this financial crisis. This responsibility requires more transparency and communication, inside the company with the collaborators and outside of the company with the society, while companies try to improve the degree of control and to authorize managers to realize the objectives of the company. The objective of this paper is to present the concept of the responsibility generally and the various types of manager's responsibility in private individual within the company, as well as the explanatory theories of this responsibility through the various perspectives such as: economic, political, social and behavioral. This study should have academic and practical contributions particularly for regulators seeking to improve the companies' practices and organizational functioning within capital market economy.*

Keywords: *Manager, accountability, corporate performance, financial crisis, behavior.*

Introduction

Since the end of 1990s the managers were confronted with increasing requirements on one side on behalf of the financial and accounting markets, but also on behalf of the various more and more influential internal and external stakeholders. These requirements put the manager in an awkward situation because he is asked the latter to give more effective strategic choices, allowing the company to live and to develop in an environment of uncertainty and complex. Furthermore, the recent international financial scandals that have manifested in the early twenty-first century have shown the shortcomings of supervisory practices and gaps of the current system of governance of companies. Major theoretical and empirical contributions showed themselves about the problem of these crises, the interest focused on the functioning of governance of company to answer the problem posed by the crisis and find an explanation which limits the responsibility of the managers of the financial institutions.

Therefore the links between the governance and the empowerment are obvious; the good governance can be realized by a number of blocks of construction such as the responsibility and other mechanisms. Several countries such as the United States, France, Germany and the United Kingdom took measures to strengthen the responsibility of the manager within the framework of improvement of their governance systems of company by the adoption of new laws, creating mechanisms of long-term security, move forward the shareholder democracy and the employee

participation to the governance, by applying new standards and establishing guidelines to increase expectations and responsibilities of the managers. Certain Laws were adopted by the states of these countries in answer to these requirements, thus we find that these countries focus on a main objective is to create the regulations obliging the managers to account (accountability) of their activities so on the function of control and surveillance and their impact over the company.

The objective of this study is to treat the various types of the manager's responsibility in private individual within the company, as well as the explanatory theories of this responsibility. Firstly, we are going to show the origin of the term «the responsibility» with its numerous definitions which have been proposed by the researchers according to various disciplines and in terms of the culture of the country. So, the general responsibility of the company will arrive at the responsibility of its management (the manager of the company) and the various types of this responsibility. In the second place we approach the various theories which handle the concept of the manager's responsibility in the sense of the company according to different perspectives such as economic, political, social and behavioral.

The sense of responsibility (Accountability):

« Accountability refers to the perception of defending or justifying one's conduct to an audience that has reward or sanction authority, and where rewards or sanctions are perceived to be contingent upon audience evaluation of such conduct »

Buckley and Tetlock

The concept of the responsibility appeared to the end of the XVIIIth century in the Roman law during the writing of the civil and penal codes. The article (1382) of the civil code shows that «Any fact of the man which causes a damage to others obliges the one because of which it arrived, to repair it ». According to Mercier (2000), this term comes from Latin "Respondere" (to answer) mean that we are obliged to justify our actions and then to support the consequences and before any specifying the rights and the duties of the person who must be responsible. Of more the dictionary *Oxford* defines the term "responsible" as susceptible to be called to answer of responsibilities and to be capable of counting or of explaining. On the other hand more *le petit Robert* the responsibility can be defined as the intellectual, moral obligation, to carry out the duty or a commitment.

The term "responsibility" reflects mainly a moral or professional, ethical mixture of responsibility. Most of the definitions of this concept were proposed by the researchers according to various disciplines and according to the culture of the country. According to Licht A. N. (2002), the responsibility belongs to an important category of the social standards which can be collectively called «standards of governance ».

In social psychology, the responsibility is the social and psychological link between individual decision-makers on one hand and the social systems on the other hand. Edwards and Hulme (1996), defines it as the process according to which the actors and the organizations are kept responsible for their actions. From the political point of view, the responsibility is a mode of exercise of power, thus this concept moves generally of peer with other principles. These include the delegation, the communication, the autonomy, the authority, the power and the legitimacy. However the responsibility is put in several terms, legal (civil and penal responsibility), economic (financial and economic responsibility) and social (social responsibility of company).

The responsibility is not a universal concept; it is a complex and dynamic term. In most of the languages, the diverse forms of term of responsibility are used instead of the concept to be accountable in English. For example, in the French language this concept is source of confusion,

it is generally connected with the terms of authority, power and obligation to be accountable. On the other hand in the English language we find two concepts the first one, the "responsibility" which means the extension of the field of decision of the entity and the second, the accountability what it is brought to account. For our part, it is in this second sense of the word responsibility that we are interested.

Finally, it is a complex and dynamic concept. She can be not only defined as a way by which the individuals and the organizations are kept responsible for their actions but also as a way by which organizations and individuals assume the internal responsibility during the elaboration of their mission and the organizational values. This concept leads us generally to ask some main questions: for what as it is must be responsible. In front of whom must we be responsible? And what are the ways at our disposal to be responsible?

The various types of manager's responsibilities in the company

To understand the responsibility of the managers of companies, it is essential to specify the responsibility and the objectives of the companies to which these belong. The term responsibility of the company includes every relation between the company and its internal and external actors. Some authors as Dobson (1999), shows that the only responsibility of the company is to try always to maximize its wealth. Jensen and Meckling (1976), considers the company as a knot of contracts. The company is a simple function of production and cannot have of responsibility. She cannot have of preferences, thus it is its agents who are responsible acts (the managers) because she does not possess clean personality.

The oldest shape of the company is the family company where the owners have the power of decision and responsibility as individual actor and not collective, Gomez (2003). The responsibility of the company here (responsibility of its founder) defines itself by the increase of the economic and financial interests as well as by the environmental protection of production and the social conditions and naturally the legal rules. The manager is rather guided by his own reference frame executive (familial) and his values with an objective to guard his reputation and not to make of damage, Robins (2008).

On the other hand, in a company of shareholder kind where there is a development of the rights of property, so the separation of the functions (property/manager), the maximization of the interests of the shareholders appears. According to Friedman (1970), the company has to try to increase its competence, to respect the rules of market, and to use its resources for accroitre its profits. Manager's responsibility is thus the profitability of the investments of the shareholders and the creation of their values. This company logic can be encouraged by mechanisms of payment aiming at aligning the payment for the leaders with regard to the maximization of the shareholder value.

Then, in the company of a wider vision (partenariale), it engages a responsibility towards the shareholders, the customers, the employees, the suppliers, the competitors, as well towards the other engaging parties which maintain a relation with it. As a consequence the direction of the company does not focus any more only on the couple leaders/shareholders but on all the potential engaging parties to contribute to the consequentive creation, and for a not only economic but also social and environmental objective. On the other hand, the likely conflict between the managers and the owners exceeds the research for the personal advantages of the actors. This vision of the company is rather based on the research for the best collaboration between existing and untouchable active persons. The company is not so any more as a set of contracts but as a laboratory of knowledge and the competence where the objective of the governance is to support the global learning and the durable innovation of the company, Charreaux (2004).

Thus the responsibility of company becomes that to maximize the creation of total value for the various engaging parties and the research for an economic and social global performance through the application of collaborates mechanisms, by aligning the self-interests of the actors, and by developing the know-how. A new vision of the company developed in 21th century based on the political and governmental aspects where the company seen as a modern institution steered not only to way partenariale but with an important public power. Gomez and Korine (2009). Thus the responsibility of the company rests on all the cultural, social conditions, and naturally the public standards.

Generally, the responsibility according to its adjective can be contractual liability, social responsibility or functional responsibility, or according to in front of whom the person is responsible (manager's responsibility in front of the board of directors). The manager of the company is responsible for different interests with regard to various engaging parties to the company. More precisely, and within the framework of the company we can distinguish three main types of manager's responsibility: the first one is the financial and economic responsibility where the manager has to try to serve better the shareholders by maximizing the financial and economic value of the company. The second type of manager's responsibility is the social and human responsibility towards the various persons who exist inside the company (especially employees). Finally, the social responsibility of the manager towards all the internal and external engaging parties of the company.

Manager's financial and economic responsibility

The traditional theories of the firm are the origin of this type of responsibility, and more exactly the classic economic theory and the neo-classic theory where the obligation of maximization of the financial results is the main objective of the company.

According to Adam Smith, the company exists for a function of production of possessions and services and increase of their profit, and for it the company has to engage all its resources and its investments. The neo-classic conceptions support this idea that the responsibility of the company and their managers impose the research for the profit with consequences several times negative or for the individuals who work inside the company or outside. According to this vision the manager tried mainly to protect himself against a potential eviction on behalf of the owners and to favor the objectives associated to the initial creation of their profits.

This type of responsibility is very limited and it is at present illegitimate because it leads to consider only a single group, that of the shareholders owners and because the others as the simple factors of production, now in the current theories of organizations the various parts constitute an important actor. Furthermore, Maslow (1970) shows that the man acts according to a hierarchy of needs (physiological, of security, social or membership, respect, personal development) and not only according to the financial interest.

Manager's social responsibility

The demands of accounts increased to handle wider to include also the engaging parties such as the employees, the customers or the others, Martin (2009). According to this type of responsibility the managers of company have obligations towards the persons who work inside the company and especially the employees {the manager has to make the employees prefer of justifiable and profitable risk-taking on the long term (not necessarily on the short term) and not to think still of their pensions}. Thus according to this type the managers have to take account of the other actors and not only the shareholders.

This type of responsibility neglects the leading role of the company (the outside of the company) in the life of the organization. Posner and Schmidt (1984) also shows that this model neglects the role of the other people who can influence the decision of manager (for example

the suppliers). According to Paved (2000), there is a daily manager's responsibility compared with the internal stakeholders (the employees), but also of other responsibility compared with the external partners (for example the customers, the service of marketing and consumption, labor syndicates and their relations with the employees) with various interests. On the other hand we find some manager dedicates himself more on the maximization of the profits of his company and he privilege the sustainability of their structure, his economic efficiency and he doesn't hesitate sometimes to lay off employees if it is conducted to ensure the success of his company.

The societal manager's responsibility

In this type of responsibility the managers of the company are responsible towards the internal and external partners of the company and according to this model the role of managing not only the profit of the internal partners but he owes considers all the external actors when he makes decisions especially strategic to assure at best the development of the company. We find in this type of responsibility some manager who gives more importance for the societal stakeholders which are in relation express with his company. Where it looks for this manager to maximize their personal prestige in front of these stakeholders and of external valuation to be acceptable socially.

Freeman (1984) to grant a central place for the manager, according to him the manager's responsibility exceeds the traditional vision, the manager plays a political and social role through the participation the public debate, and through its work with a real team to understand the multitude of stakeholders and strengthen the credibility of the company.

Finally it is useful to quote that the manager's responsibility has a temporal dimension that is the manager is responsible towards his company generally on the long term, thus he must be conscious of his decisions and his power, and that is the manager is responsible towards himself before any, as a man and without having what is its work.

The explanatory theories of the manager's responsibility in the company: various perspectives

Several theoretical currents contribute to the understanding of the general responsibility of the company, naturally the responsibilities of their manager. We find the works bound to the classic approach (the theory of agency and the costs of the transactions), the theory of the stakeholders, the theory of the dependence of the resources in complement with the institutional neo-theory, the strategic theories, and the behavioral theories. The main initial idea is to favor the ruling relation and the shareholder as the main key of the performance in the company.

The economic perspective

The work on the governance of company begins from the theoretical hypothesis within the framework of the theory of agency where there is a relation which defines by a contract between executives managerial which deposits the power and the capacity to make the decisions (the manager) of one side and the shareholders on the other side. This traditional model of the governance limits the objective to explain the financial structure of the company. This relation of agency leads to a conflict of interests and differences of the points of the seen especially where there are many asymmetries of information between both parties.

Berle and Means (1932) examined the separation of the functions of property and the direction, this entrained separation of the conflicts of interests between the managers and the

shareholders. These conflicts led the manager in pursue other objectives that the main role of maximization of the shareholder value. According to Williamson (1991), and from wider point of view of the relation of agency between the manager and the shareholders, the role of manager is an administrator of the transactions in the company where he has to try always to reduce transaction costs between the company and all the actors which can be as constituting the coalition.

According to the theory of the costs of the transactions, this relation of agency can be bigger in a way where the company can have contracts of the transactions with several parties. Manager's responsibility of the company rests here to manage the various prohibitions of a way where each of these parties exit with its profit (naturally through the minimizations the costs of agency and the costs of the transactions where the company seen as a knot of contracts and a team of production). According to this vision, the manager follow objectives of economic nature, his purpose is to satisfy the financial interests. And in this context, manager's responsibility is minimal; the only obligation for him is to maximize the profit.

According to Jensen (1983) various mechanisms are necessary to align the interests of mandates and make the manager more responsible, on one hand internal mechanisms to the company, generally imposed by the law (for example, the board of directors, the general assembly of the shareholders) and on the other hand of the external mechanisms based mainly on the power of market (for example, the market recovery, auditors' market).

The political perspective

This theoretical current contributes to the understanding of the responsibility of the manager through an additional approach in the theory of agency and the costs of transaction. It is about the theory of entrenchment of the managers. This approach applies to all the partners of the company and especially the manager who tries to preserve his place in the company and to increase his entrenchment to reduce the risk of revocation. This allows him to maximize his power and his discretionary space, besides the various advantages that he perceives especially his payment.

Entrenchment of managers and their responsibility towards the shareholders

The manager as the agent particular to the company can use the resources to take root and escape from their responsibility towards the shareholders in a way that he increases his freedom of action, to increase his pensions and his secondary advantages, Charreaux (1997). From point of view of the shareholders, this type of behavior followed by the manager is illegal when he leads to negative consequences concerning the investment and the increase of the general costs in the company where the manager looks in privilege for his interests and for his personal advantages, and consequently a negative effect occurs on the wealth of the shareholders, Paquerot (1997).

According to Sheifer and Vishny (1989) the managers follow several processes of formal and informal entrenchment. In a formal way, the manager can favor the development of activists where he uses the asymmetry of information as way to escape from control. On the other hand and in informal way the manager can make alliances with one or several actors of a quotation to the company (for example with employees) and on the other side with the shareholders, or simply through the plurality of offices of manager and administrator, Paquerot (1997). This manager develops generally several strategies to serves him in the use the averages at his disposal to have a wider meaning of a word on all the stakeholders. We can quote three types of strategies through the literary man:

Firstly he can proceed to the specific investment policy as remarkable tool of entrenchment, Stiglitz (1992). This type of entrenchment of manager is privilege by several research works such as Jenses (1986), Shleifer and Vishny (1989).

According to Boot (1992) the company having very specific activists where the manager tries to take advantage of these activists for its interests (where there are fewer controls on these activists and on the performance appraisal). These less visible activities in the company lead us to speak to the second strategy at the disposal of the manager to retread his responsibility; it is the manipulation of the information. The manager always tries to make the understanding of the very difficult information. According to Charreaux (1997), he favors the disclosure of the information which is useful for his human capital and as well increases the uncertainty perceived by the other rival managers through these manipulations.

Another type of managers' entrenchment strategies is the one relational network in a formal or informal way; in more these networks can be made with all the actors of the company. Paquerot (1997) shows that the manager can realize relations with one or several groups of the shareholders. He tries to make a relational network with the employees where he can keep his post and at the same time realize employee's interests.

By the way informal, the manager can establish low relations on his capital with the administrators of the company through the connections of the board of directors especially if he is at the same time general president of board meeting, Pichard (1998). On the other hand he can realize relations with other administrators outside of the company when he is mandate in other company, thus that to allow him to make exchanges with them and he profit in that case of the confidence to make an advantage and take root more. We can conclude that the impact of this type of behavior followed by the manager is unfavorable to the interests of most of the actors of the company where its performance is not easily observable.

The stakeholder theory and manager's responsibility

Today, the decision of manager affected by the social pressures so that he to consider his responsibility towards in sound aggravate. The origin of thought on which the manager must be responsible and in the work of Dodd (1932), quoted by Mercier (2010). Dodd (1932) shows that the field of the responsibility of the augment manager for all the groups which are in connection with the company. According to him, there are three main groups of interests:

Firstly, the group of the shareholders which invests capital in companies, thus the manager has to protect and reassure their investments and be responsible in the use of this capital to handle which to allow maximizing their profits. Then, the actors who give their human effort so that the company to live and develops where the manager has to take into account their safeties, wage satisfaction and other rights. At the end, it is the group which exists outside of the company that is the customers, the suppliers and the company generally where the manager owes satisfied their expectations as regards products and services.

The concept of fascinating parties is wide and ambiguous. It is used in several domains but essentially in the business administration. Freeman (1984) defined the stakeholders by all the individuals or the groups which can affect or are influenced by the decisions of the managers of the company (that is in a positive way or in a negative way). These stakeholders can be classified in a simple way between the internal stakeholders (the actors inside the company especially the employees, the shareholders and the managers) and the external stakeholders that is all the groups which have implicit or explicit relations with the company, for example the suppliers, the government, the competitors or the environment.

This theory exceeds views it classic of the company. It looks for the interests of the stakeholders not shareholders and to widen the field of the manager's responsibility, Mercier (2001). Furthermore, it is the theory most frequently usable through the academic literature, it

presents the company as a group of collective interests and it helps the manager to make more useful and more effective decisions and in a strategic way because of their skills, Freeman (1984).

According to Donaldson and Preston (1995), there are three main visions of this theory, worth knowing descriptive, instrumental and normative vision. According to the normative vision, this theory allows to legitimize actors' interests not shareholders of the company and to escape the classic vision. Then, this vision allows identifying the values and the obligations where the manager can guide the company in a strategic way, (the social performance of the company here is very important), thus this vision gives an ethical foundation to the theory.

According to the instrumental aspect, this approach shows that the manager has to manage the relations with the stakeholders of a way which allows him to realize the purposes of the company and to report the responsibilities towards the owners of the company, Jones and Wicks (1999). At the end and from point of descriptive view, this model helps to explain the behavior and the relations of the company with sound aggravate, and how the manager must be responsible towards the interests of the various stakeholders. Finally it allows taking advantage of the history of the company to have opportunities at the future, Donaldson and Preston (1995).

We can conclude that the theory of the stakeholders reformulates the role of manager and the company widens the vision of agency. In this context and from responsible point of view, the manager has to try to reduce the risks which can influence the interests of all the actors, created by the pensions for the various partners with an optimal balance of the interests, and develops his company. As a supplement to the partnership approach of the theory of the stakeholders, the theory of the integrated social contracts shows that the company director have a moral and ethical responsibility towards the stakeholders and in collective way, Mathieu and al (2010). According to her the company lives in a place where he has to respect and serves the interests of the company, that is the behavior of manager owes considers that his company signed an implicit contract with the company where it develops.

On the other hand, we can quote that this theory knows some limits, of a highly-rated it is difficult to encircle all the interests of all the stakeholders especially with a rationality limited by manager, and on the other side it is difficult also to control if the manager was very optimal in its decisions concerning these stakeholders. Thus it is relevant to envisage the possible reconciliation of the theory of the stakeholders with other paradigms as the theories of the strategy based on the skill and the institutional neo-theory. These various different brought theories propped up important regarding the *manager's responsibility*.

The social and behavioral perspective

Theory néo institutional and manager's responsibility

The basic idea of the theory néo institutional is the fact that companies adapt themselves not only to the internal constraints but also to the values of the company external. The new institutionalisms try to describe the processes which transform the practices and the organizations into institutions. Richard Scott (1992) defines the institutionalization as " the process according to which the actions are repeated and give by this fact a meaning similar to the other actions ".

This theory offers the ground the most exploited in the understanding of certain behavior in the company. It shows that the manager tries to adopt behavior acceptable legally and competitive. The legitimacy where the company tries to realize it comes from the cultural and social requirement on it. According to Suchman (1995), this legitimacy is a generalized perception that the actions of an entity are desirable, suitable and corresponding to a system of standards, values, faiths and definitions socially built.

Dimaggio and Powell (1983) stipulate that the fast distribution of quality circles in the American companies is motivated by the legitimacy of the companies which adopted these practices and not by their efficiency. This legitimacy is so much looked for especially in an uncertain environment. It becomes a need for which companies try to acquire. Each of the managers looks by making a decision to legitimize towards his company and towards the other members of the company. The legitimacy is translated here on the level of the managerial decisions by a more acceptable decision. The managers try to legitimize their decisions of investment, financing or governance (for example, the decision of reduction or increase of the size of the board of directors may be explained as search legitimacy).

Thus these questionings of the legitimacy can have a positive influence, where they urge the managers to emphasize the necessity of managing well the social and environmental risks, thus they support the development of a responsible reflection for the manager. On the other hand, Assaba and Lieberman (2006) underlines that when a set of social players adopt a behavior, this behavior will be considered as institutionalized and other social actors would be incited to adopt it without any reflection.

In this context, the institutional neo-theory postulates that the organizations which evolve in the same organizational field tend to develop more and more complex common standards and have to acquire gradually similar behavior. This comes back to the existence or from explicit rules or from the laws which aim at assuring this mechanism of convergence, or usual activities which are underlain by standards, values and expectations, with cultural character, or still by the wish to be or to look like the others.

However, this theory uses the term of isomorphism to describe the convergence resulting from the mimicry (manager use mimetic behaviors). The isomorphism is considered by the followers of the neo-institutional theory as the concept the most adapted to the description of the dynamics of homogenization. According to Dimaggio and Powell (1983), the isomorphism allows identifying the process which leads the unit of a population to look like the units facing the same environmental conditions.

What allows explaining the behavior of the managers? These authors distinguish three forms of isomorphism: the coercive isomorphism, the normative isomorphism and the mimetic isomorphism. They expressed that the mimetic isomorphism results from the wish to look like the other organizations. It is about the mimicry of companies by implementing the practices of others, those who are the most recognizable, those most successful competitors or those were considered as the most justifiable in a field. The managers of companies find in their memberships in a relational network this possibility of imitating the other managers who are successful, they can thanks to the exchange and to the sharing which becomes established within identified networks the most successful practices and as a consequence adapts it. The mimicry is a solution during the managerial decision-making, a choice of investment can be only made by adopting a mimetic behavior of others. Of more this mimetic behavior can explain for example a dividend policy or can explain as well a financing strategy.

Indeed, the purpose of this shape of behavior used by the company is to award its necessary responsibility to continue to exist. And this mimetic process it is going to bring to realize this social responsibility is the fact of integrating and of adapting itself to common standards. Furthermore in numerous situations, the companies of the same organizational field act not by concern of efficiency or research for optimal solutions but with the aim of conforming to institutional pressures which lead them to adopt similar organizational models. The legitimacy is a purpose looked more and more by the managers. To be able to legitimize its choices and his decisions in front of shareholders and of the various stakeholders is a purpose which every manager tries to have. This legitimacy allows reducing the pressure which is put on them.

We can conclude that this theoretical approach, explains that the existence of a company in an environment gives an idea on what companies should look like and the way they should behave. They have in fact tendency to develop common standards and similar behavior by adopting behavior in the purpose and the desire to be justifiable with their peers and what whatever is the nature of the constraints which urge to converge on these common standards.

The behavioral approach and the manager's responsibility

This approach gives the importance for behavioral biases which can influence the whole governance system (main influence on the explanation of the information and the way of manage the conflicts by the manager where we find a not insignificant affectation of cognitive biases on this approach), Charreaux (2005). They allow us to escape the traditional vision of the governance a behavioral vision of the relation between the manager and the stakeholders. Charreaux (2005) show that there are the four major currents of the behavioral approach: Behavioral economy, finance behavioral, current behavioral "economic law" and the behavioral current in strategic management (Table 1).

The behavioral economy base on the contributions of the cognitive and social psychology for includes the behavior of manager during the grip of economic decisions in a situation of the uncertainty, Rabin (2002). On the other hand the behavioral finance becomes attached to the study of the behavior of the individual, when it is a question of making a decision of investment, a type of decision with which is confronted the manager of the company. Thus the objective this approach is the understanding and the prediction of the behavior of the agents on the financial market and the process of grip a decision. So, the behavioral finance can be seen as the application of the psychology in the finance. On the other hand the strategic current of behavior tries to study the influence of the behavioral ways (especially cognitive) on the strategic decision of steering for example the impact of board of directors on the manager's cognitive reflection, Langevoort (2001).

Table 1: The main currents of behavioral literature in economics and management sciences as Charreaux (2005).

			Objectif	Main Authors
Behavioral Economics			Illuminating the economic behavior with psychology, anthropology, sociology ...	Kahneman, Tversky, V. Smith, Rabin, Loewenstein...
	Neuroeconomics		Study of brain imaging in economic decision-making	Camerer, Prelec...
	Law & Economics		Improve the explanatory theories of law (paternalism ...)	Jolls, Korobkin, Langevoort, Cunningham...
Behavioral Sciences Management	Finance	Market	Explain the anomalies	Shiller, Shleifer, Thaler, Barberis, Greenfich...
		Company	Understand financial decisions and the role of governance	Shefrin, Baker, Bigus, Charreaux...
	Accounting		Analyze failures analysts and financial auditors	Ricardo...
	Marketing		Explain consumer behavior	Filser...
	Strategic Management		Understand decision making process	Simon, March, Hogarth, Bazerman, Schwenk.....

Behavior of manager and its responsibility in the company

Various behaviors are kept by the manager during its managerial decision-making. But how we can define the behavior of manager, which are its dimensions and its factors determining within the framework of commitment responsible for this manager?

The decision-making concerns any alive body endowed with a nervous system. It interests every individual and every group. It is about a method of reasoning which can lean on rational and/or irrational arguments. The theorists of the Carnegie School March, Simon, Cyert asserted that the complex decisions are more the result of factors bound to the behavior than the systematic research for an economic optimization. For them, the individual cannot spot all the possible choices then he chooses the satisfactoriness solution and not the maximizing solution. The manager thus motivated by its personal interest.

According to the traditional approach of the responsibility (financial approach) the manager follows generally two behaviors (the wait-and-see behavior and the adaptive behavior). Strap and Reynaud (2004) shows that the manager adopts a wait-and-see attitude when the not very clear situation and it is need for time to make a decision. According to the second case (current decision) the manager tries to solve the problems by a strategy which plans to return mainly the legal risks and by concern of protection the economic advantages and of the investment (economic and legal responsibility).

In reality, we find several aspects of behavior such as: deliberate versus spontaneous, cognitive versus emotional, individual versus collective. The maybe deliberate decision of manager where there are mechanisms which are formalized, as the board of directors, the system of remuneration and incentive, or spontaneous where there are informal mechanisms for

informal reliable networks, Charreaux (2002). As well as the behavior of manager can be based on a cognitive either emotional logic, according to Rabin (2002) we find the origin of these dimensions in the literary of psychology more than in finance where the feelings of the managers present to explain their decisions.

On the other hand, we find a lot of individual or collective behavior of manager in governance and corporate finance, where the manager must be responsible towards rulers (legal, political, social) to manage to realize the objective of the company. According to Chareaux (2003), and within the framework of the partnership approach of the governance, the manager makes the decisions in interaction with various relational and social networks (for example, the board of directors) that influence his behavior. A manager has more tendency to imitate the behavior of another manager in case he maintains with him a contact which allows to observe and to interpret his behavior and how he react concerning his responsibilities against the others.

Thus, the manager's networks may increase the mimetic behavior and afterward increase the collective cognitive biases of the behavioral finance. This type on the bias is a questioning of the initial decision of the decision-maker by aligning with the tendency. The fact of belonging to a community of the managers is susceptible to advance this bias. This questioning of the decision can be had a negative impact when it turns out against the initial decisions, but it has a positive impact when it is in compliance with the same decisions.

The main origin of these biases is psychological are many in the literature and we can classify these biases according to two criteria the first one cognitive / emotional and the second individual (decision-making in isolated way) / collectives (the decision-making in a collective frame), Charreaux (2005). The consideration these behavioral biases concerning the manager can explain the various stakes in his responsibilities (shareholder, partnership, and societal).

We quote for example from these biases the bias of mimicry) as a cognitive and collective bias which has a major influence on the behavior of manager. Other bias which can drive to an inequitable behavior is cognitive biases based on the phenomena of groups (sharing of the same initial training which leads to a cognitive homogeneity between the managers). Greenfinch (2005) presented the main behavioral biases following the various behavioral dimensions for the finance and governance of company, (Table 2).

Table 2: The various on the bias behavioral types¹.

	Individual bias	Collective bias
Cognitive bias	Anchor, attention allocation, beliefs, cognitive overload, cognitive dissonance, framing, heuristics, irrationality, representativeness, mental compartmentalization, usually retrospective, home ...	Cascades, common beliefs, consensus, handling, memes (*), mimicry, paradigms, percolation, rational expectations (positive feedback / positive feedback), social learning ...
Emotional bias	Addiction, endowment effect and inheritance wait and magical expectations, denial, greed, fear, loss aversion and regret, wishful thinking, optimism, confidence, pride, status quo	Conformism epidemic / contagion, mania, thoughts or whims group / inhibitions, mass hysteria, fashions, herd behavior, peer pressure ...

(*)Cultural transmission units

¹ This Table by Charreaux (2005).

Concerning the main determiners of the behavior of company director. Simon (1955) shows that the success of manager in his way to make the decisions depends firstly in the relevant and clear knowledge and his capacity to collect the useful information and afterward to handle this information to incorporate into his decision-making. But the behavior of manager influenced in this stage of decision (collect and handle the information) by the reference biases such as the faiths, Shefrin (2001). The manager would be influenced by the self-interests in particular their values and the power of this manager would result characteristic personal and of the nature of the pressures with which he is confronted, thus we find that the frame rather plays an important role at the hour when the leader to face his responsibilities towards his company, where this frame gets organized generally author of the value, the influences of the partners, and the uncertainty, Simon (1995).

The behavior of manager depends as well on its capacity to estimate the available alternatives where he is responsible for making the best choice, and here the knowledge, the learning and manager's cognitive capacity plays a remarkable role. We can evoke also that the optimism and the reliable supplement can lead the manager to a profitable behavior for the shareholders just as the manager is interested in his profits, Baker and al. (2004). At the end the manager can be selfish at the time of his choice through the personal research for his advantages such as his payment, his crawling, and his legitimacy either heard altruism (in the sense of their responsibilities) and to act in interest of the various parts of the company and the company generally.

Finally, the following table presents a synthesis concerning the responsibilities of the managers and his potential behavior according to the various theoretical approaches of the company.

Table 3: The responsibilities of the managers and their potential behavior according to the various theoretical approaches of the company.

	Contractual approach		Cognitive approach		Behavioral approach
	Shareholder	partnership	strategic	Neo-institutional	
The company's main objective	Production function and economic and financial objectives	Economic, financial, and social objectives	Competitive and sustainable objectives	Cultural and intermental objectives	Objectives of profitable behavior for all groups
Manager roles and responsibilities	Responsibility results in maximizing shareholder wealth	Responsibility results in maximizing stakeholder wealth	Responsibility is reflected in the ability to optimize the production and selection of slimming company's strategy	Responsibility is reflected in the satisfaction of the objectives of the entire "network" of stakeholders	Behavioral responsibility of the relationship between the manager and the stakeholders

	Contractual approach		Cognitive approach		Behavioral approach
	Shareholder	partnership	strategic	Neo-institutional	
Controls the behavior of manager	Seeks to reduce conflicts of interest and agency costs	Seeks to reduce conflict and balance the different interests	Seeks optimal use of different resources	Seeks to adopt legally acceptable and competitive behavior	Seeks to reduce the influence of behavioral biases on leadership decisions
Type of corporate governance	Shareholder governance	Partnership governance	Cognitive governance	Cognitive governance	Behavioral governance

Source: author

Conclusion

In the complex situations the company managers try to find a model of responsibility on which they are going to base themselves at the time of decision-making to try to reduce the unpredictability and the uncertainty in which they are. The objective of this paper was to clarify the concept of the responsibility generally and the various types of the manager's responsibility in private individual in the sense of the company, as well as the explanatory theories of this responsibility through various perspectives such as economic, political, social and behavioral. These theories offer the ground the most exploited in the understanding of certain behavior in the company, they show that the manager tries to adopt justifiable behavior and at the same time responsible.

References

- Berle, A.A., & Means, G., (1932). *The Modern Corporation and the Private Property*. New York, McMillan.
- Boot, A.W.A., (1992). Why Hang on to Losers? Diversitures and Takeovers. *Journal of Finance*, 47(4.)
- Charreaux G., (1997). Vers une théorie du gouvernement des entreprises, in G. Charreaux (éd.), *Le gouvernement des entreprises : Corporate Governance, théories et faits*, *Economica*, 421-469.
- Charreaux G., (2002). L'actionnaire comme apporteur de ressources cognitives. *Revue Française de Gestion*, 28(141), 75-107.
- Charreaux G., (2003). Le gouvernement d'entreprise, in J. Allouche (coord.), *Encyclopédie des Ressources Humaines*, Vuibert, 628-640.
- Charreaux G., (2004). Les théories de la gouvernance : de la gouvernance des entreprises à la gouvernance des systèmes nationaux. *Cahiers du Fargo*, 1040101.
- Charreaux G., (2005). Pour une gouvernance d'entreprise 'comportementale' : une réflexion exploratoire. *Revue Française de Gestion*, 31, (157), 215-238.
- Dimaggio P.J., & Powell W.W., (1983). The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48, 147-160.
- Edwards, M., & Hulme, D., (1996 a). *Beyond the magic bullet: NGO performance and accountability in the post-Cold War World*. West Hartford, CT: Kumarian Press.
- Donaldson T., Preston E., (1995). The Stakeholder Theory of the Corporation: Concepts, Evidence and Implications. *Academy of Management Review*, 20(1), 65-91.
- Freeman R.E., (1984). *Strategic Management: A Stakeholder Approach*. Pitman, Boston.
- Friedman M., (1970). The Social Responsibility of Business is to increase its profits, *New York Times Magazine*.
- Gomez P.Y., (2003). Jalons pour une histoire du gouvernement des entreprises », *Finance Contrôle Stratégie*, 6 (4), 183-208.

- Huault I., (2002). La construction sociale de l'entreprise : autour des travaux de Mark Granovetter. Calvados.
- Jensen, M.C., (1983). Organization theory and methodology. *Accounting Review*, 58.
- Jensen M.C., (1986). Agency Costs of Free Cash-Flow, Corporate Finance, and Takeovers. *American Economic Review*, 76 (2), 323-329.
- Jones T.M., & Wicks A.C., (1999). Convergent stakeholder theory. *Academy of Management Review*, 24 (2), 206-221.
- Langevoort D.C., (2001). The Human Nature of Boards: Law, Norms, and the Unintended Consequences of Independence and Accountability. *The Georgetown Law Journal*, 89, 797- 832.
- Licht A.N., (2002). Accountability and Corporate Governance. Available at SSRN: <http://ssrn.com/abstract=328401>.
- Mathieu A, Chandon J-L, Reynaud E., (2010). Le Développement Durable en actions : approche de l'innovation dans le champ de la durabilité. Conférence de l'AIMS, Luxembourg, juin.
- Martin M., (2009). The limits of accountability, *Accounting Organizations and Society* , 34, (8), 918-938
- Martinet A.C., & Reynaud E., (2004). Stratégies d'entreprise et écologie. *Economica*, Paris.
- Mercier S., (2001). L'apport de la théorie des parties prenantes au management stratégique : une synthèse de la littérature. Actes de la XIème conférence de l'Association Internationale de Management Stratégique, Université Laval, Québec, 13 – 15 juin.
- Mercier S., (2010). Une analyse historique du concept de parties prenantes : Quelles leçons pour l'avenir ? *Management & Avenir*, 33, 140-154
- Mercier S., (2000). La formalisation de l'éthique en gestion : une analyse critique. Avec J-M. Courrent, in Actes de la 9ème Conférence Internationale de Management Stratégique, Montpellier.
- Paquerot M., (1997). Stratégies d'enracinement des dirigeants, Performance de la Firme et Structures de Contrôle, in *Le Gouvernement des Entreprises* (éd G. Charreaux), Ed Economica, 105-138.
- Pava ML., (2000). The search for meaning in organizations: seven practical questions for ethical managers », *Sloan management review*, 41, (2), 101 - 102.
- Pichard-Stamford J.P., (1998). La légitimation du dirigeant par le réseau des administrateurs, dans Actes des XIV journées nationales des IAE, Nantes, 389-407.
- Posner B.Z., & Schmidt W.H., (1984). Values and the American Manager: an Update. *California Management Review*, 26, (3), 202-216.
- Rabin M., (2002). A Perspective on Psychology and Economics. *European Economic Review*, 46, 657-685.
- Robins F., (2008). Corporate Governance after Sarbanes-Oxley: An Australian Perspective. *Corporate Governance*, 6, (10), 34-48.
- Shefrin H., (2001). Behavioral Corporate Finance. *Journal of Applied Corporate Finance*.
- Shleifer A., & Vishny R.W., (1989). Management Entrenchment: the case of manager's specific investments. *Journal of Financial Economics*, 25, 123-139.
- Stiglitz J.E., Edlin A.S., (1992). Discouraging Rivals: Managerial Rent Seeking and Economic Insufficiencies. NBER Working Paper, n° 4145.
- Suchman M.C., (1995). Managing Legitimacy: Strategic and Institutional Approaches », *Academy of Management review*, 20(3), 571-610.
- Williamson O., (1991). Strategizing, economizing and economic organization. *Strategic Management Journal*, 12, 75-94.

COMPARING THE PRECISION OF DIFFERENT METHODS OF ESTIMATING VAR WITH A FOCUS ON EVT

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Abstract: *The paper aims to conduct a comprehensive research in sphere of risk measurement. This study would like to determine the forecasting precision of different risk estimation tools through implication of popular methods e.g. parametric and non-parametric methods in this field and more fresh and complicated methods e.g. semi-parametric methods and finally confirming the results with exploiting backtesting methods. Design/methodology/approach – The paper opted for a quantitative approach of measuring VaR. Estimating VaR by implying 8 different methods then comparing the obtained results based on backtesting criterion. We put into examination 6 major international stock exchange indices e.g. Canadian TSX, French CAC40, German DAX, Japanese Nikkei, UK FTSE100 and US S&P500 from 03-June-2003 to 31-March-2014 meanwhile we used rolling-window technic for backtesting purpose. The data were obtained from Yahoo! Finance. Findings – The paper empirically determined extend to which, the aforementioned methods are reliable in estimating one-day ahead VaR. we find out that EVT and HS are the two most precise methods albeit at very high confidence levels the EVT produces the most accurate forecasts of extreme losses. Results of this study encouraged financial managers to turn from using traditional methods of risk measurement to more fresh and reliable one such as EVT method of estimating VaR. Originality/value – This paper fulfills need to a comprehensive study of different proposed methods of measuring risk and showed the estimated VaR of them in a readily comparative manner.*

Keywords: *VaR, HS, GARCH (1, 1), EGARCH, GJR-GARCH, AGARCH, DCC-MGARCH, FHS, EVT, Simulation Technique.*

Introduction

Notion of risk refers to a probability of happening some undesirable event, which is closely related to uncertainty. For financial risks, appropriate definition might be “any event or action that may adversely affect on organization’s ability to achieve its objectives and execute its strategies”. Indeed, two essential tasks of financial managers* are to a) forecast these adverse events and b) evaluate the market risk exposure by estimating losses -in advance – that is expected to occur in time of when the price of assets fall down. This is the purpose of the Value-at-Risk (VaR) methodology. VaR is a special type of “downside risk measure”. The concept of VaR is easy albeit, its calculation is not. The methodologies initially developed to calculate VaR are: (a)

* Management of risk is briefly made up of the subsequent basic activities: a) understanding the risks being taken by an institution, b) measuring the risks, c) controlling the risk, d) communicating the risk.”

Parametric method, (b) Non-parametric methods[†] and (c) Semi-parametric method. VaR not only produce a single statistic or express absolute certainty but also it makes a probabilistic estimate, and consequently refers to concept of randomness. Initially VaR ask, with taking into account a specific confidence level, what is our maximum expected loss over a specific time span?

Since VaR is the acknowledged method by the Basel Committee on Bank Supervision (BCBS)[‡], in result a growing body of literature has either proposed a new model for measuring VaR or compares the precision of VaR estimation by the competitive models. This paper contributes to comparison of several VaR using a comprehensive range of parametric, non-parametric and semi-parametric methods.

The assumption in modeling VaR e.g. normal distribution of return data series is not a realistic assumption in financial markets where the data series have thick tails, which are known by extreme events left outside the bounds of a normal distribution in modeling VaR. Neftci (2000) argues that it is likely that extreme events are “structurally” different from the return-generating process under market conditions. An obvious response to this problem is to employ a methodology that explicitly allows for the fat-tailed nature of return distributions, such as those based on Extreme Value Theory (EVT), which will be empirically examined in this paper.

Literature concerning the measure of volatility and the frequency of data to be used in parametric and non-parametric VaR is broad. Taylor and Xu (Taylor and Xu, 1997) and Anderson and Bollerslav (Andersen and Bollerslav, 1998) introduce the idea of realized volatility. ARCH family, which are considering as Parametric methods, was introduced by Engle (Engle, 1982) and GARCH introduced by Bollerslev (Bollerslev, 1986). First and most popular models allowing for asymmetrical impact of new information were: EGARCH (Nelson, 1991), TARCH (Zakoian, 1994) and GJR-GARCH (Glosten et al, 1993). Other model, most general from all presented in this dissertation is APARCH (Ding, Granger and Engle, 1993). Dave and Stahl (Dave and Stahl, 1997) showed the effects of ignoring volatility clustering and non-normality of daily returns distribution on VaR modeling. They provide a good review of VaR estimation techniques and their paper is already a classical source of reference. The idea of using intraday data when estimating volatility comes up in work of Merton (Merton, 1980). Boudoukh et al. (Boudoukh et al. 1997) applied a class of volatility models on comparison of interest rate volatility forecasts and concluded that “density estimation and Risk Metrics™ forecasts to be the most accurate for forecasting short-term interest rate volatility”.

Giovanni Barone-Adesi and Kostas Giannopoulos refinement the *Historical Simulation* (HS) methods and proposed the *Filtered HS* (FHS) in which based on results FHS outperform the HS in estimating Value-at-risk. Jacob Boudoukh et al. introduced HS (1998), which “avoids the parameterization problem entirely by letting the data dictate precisely the shape of the distribution”.

Risk managers and Portfolio managers concern extreme negative side movements in the financial markets. A long list of research has posted on this topic that is Semi-parametric technique. Ramazan et. al. (2006) examine the dynamics of extreme values of overnight borrowing rates in an inter-bank money market. *Generalized Pareto* distribution has been picked for it’s well fitting. Fernandez (2005) used extreme value theory to the United States, Europe, Asia, and Latin America financial markets for computing value at risk. One of his findings is on average, EVT provides the most accurate estimate of VaR. Byström (2005) applied extreme value

[†] (a) and (b) are also known as “conventional methods”.

[‡] BCBS involving the chairman of the central banks of Belgium, Italy, France, Swiss, Sweden, Spain, Holland, Canada, Luxembourg, Japan, the United States and the United Kingdom. This committee provides recommendations on banking regulations with regard to market, credit and operational risks. Its purpose is to ensure that financial institutions hold enough capital on account to meet obligations and absorb unexpected losses.

theory to the case of extremely large electricity price changes and declared a good fit with generalized Pareto distribution (GPD). *Bali* (2003) determines the type of asymptotic distribution for the extreme changes in U.S. Treasury yields. *Neftci* (2000) found that the extreme distribution theory fit well for the extreme events in financial markets. *Gencay and Selcuk* (2004) investigate the extreme value theory to generate VaR estimates and study the tail forecasts of daily returns for stress testing. *Marohn* (2005) studies the tail index in the case of generalized order statistics, and declares the asymptotic properties of the Fréchet distribution. *Brooks, Clare, Dalle Molle and Persaud, G.*, (2005) apply a number of different extreme value models for computing the value at risk of three LIFFE futures contracts. In this paper we will empirically estimate VaR based on EVT as well.

In the present paper, we perform an evaluation of the predictive performance of the conventional VaR methods e.g. non-parametric and parametric models as well as semi-parametric methods, which are initially mixture of the two previous methods. The models are “backtested” for their out-of-sample predictive ability by using Christoffersen’s (1998) likelihood ratio tests for coverage probability. We put into examination 6 major international stock exchange indices e.g. Canadian TSX, French CAC40, German DAX, Japanese Nikkei, UK FTSE100 and US S&P500 from 03-June-2003 to 31-March-2014. we used rolling-window technic for back-testing purposes. The data were obtained from is Yahoo! Finance. The return series have been converted into logarithmic returns. Having homogeneous data of only mature capital markets, which due to their close relationship expect to have similar characteristics, was the main reason behind choosing the considered data series.

The study is organized as follows. In section 2, we review a full range of methodologies developed to estimate VaR. In section 2.1, a non-parametric approach is presented. Parametric approaches are offered in Section 2.2, and semi-parametric approaches in Section 2.3. In section 3, the obtained empirical results of comparing VaR methodologies are shown.

Theoretical characteristics of VaR models

Jorion (2001) said that under normal market condition and at a given level of confidence VaR is the worst expected loss over a certain horizon. For example, a financial institution might say that the daily value-at-risk of its trading stock position is \$1 million at the 95% confidence level. It means, under normal market conditions, only 5% of the time, the daily loss will beat \$1 million. In fact the value-at-risk just point out the most we can expect to lose if no negative event occurs.

Therefore value-at-risk is a conditional quantile of the asset return loss distribution. Based on *Jorion* (1990, 1997) “among the main advantages of VaR are simplicity, wide applicability and universality”. Let $r_1, r_2, r_3, \dots, r_n$ be *i. i. d.* random variables representing the financial returns. Use $F(r) = P_r(r < r | \Phi_{t-1})$ conditionally on the information set Φ_{t-1} that is available at time $t - 1$. Assume that $\{r_t\}$ follows the stochastic process:

$$r_t = \mu + \varepsilon_t ; \varepsilon_t = z_t \sigma_t \quad z_t \sim iid(0, 1) \quad (1)$$

where $\sigma_t^2 = E(z_t^2 | \Phi_{t-1})$ and z_t has the conditional distribution function $G(z), G(z) = \Pr(z_t < z | \Phi_{t-1})$. The value-at-Risk with a given probability $q \in (0, 1)$, denoted by $VaR(q)$, is described as the q quantile of the probability distribution of financial returns: $F(VaR(q)) = \Pr(r_t < VaR(q)) = q$ or $VaR(q) = \inf\{v | P(r_t \leq v) = q\}$.

This quantile can be valued in two ways: (a) inverting the distribution function of financial returns, $F(r)$, and (b) inverting the distribution function of white-noise[§], with regard to $C(z)$ the latter, it is also necessary to estimate σ_t^2 .

$$VaR(q) = F^{-1}(q) = \mu + \sigma_t C^{-1}(q) \quad (2)$$

Hence, a value-at-risk model entails the specifications of function of innovations $C(z)$ or function of financial returns $F(r)$, we can carry out the calculation of these functions using the following methods: (1) Non-parametric methods; (2) Parametric methods and (3) Semi-parametric methods. Below we shall describe the methodologies, which have been developed in each of these three cases to estimate VaR^{**}.

Non-parametric Method

The major intend of Non-parametric approaches is to quantify an asset VaR without making strong assumptions about returns distribution. The core concept of these approaches is to “let data speak for themselves as much as possible” and not use to some assumed theoretical distribution rather recent returns empirical distribution- to estimate VaR. To be able to use the data from the recent past to forecast the risk in the near future all Non-parametric approaches are based on the underlying assumption that the near future will be satisfactorily similar to the recent past for us.

The Non-parametric approaches include (a) Historical Simulation (HS) and (b) Non-parametric density estimation methods. Since in this paper we empirically study VaR only based on Historical Simulation (HS), therefore, we will define properties of HS approach^{††}.

Historical simulation

In 1998 Historical Simulation (HS) was introduced in a series of paper by Boudoukh and *Barone-Adesi* as a method for estimating value-at-risk .HS is the most broadly applied Non-parametric and unconditional method. Research of *Perignon* and *Smith* (2010) recommend, “of the 64.9% of firms that disclosed their methodology, 73% (or three-quarter) reported the use of Historical Simulation rather than the parametric linear or MC value-at-risk methodologies”. This model uses the empirical distribution of financial returns as an approximation for $F(r)$; hence $VaR(q)$ is the q quantile of empirical distribution. Different sizes of samples can be taken into consideration to estimate the empirical distribution of financial returns. The keystone assumption is that the distribution of P&L is constant over the sample span and is a good predictor of future movements. In addition, this method is very sensitive to length of data sample as data may not be a good representative of current condition of market.

When value-at-risk is said as a percentage of the asset’s value, the $100q\%$ $n - day$ historical value-at-risk is the q quantile of an empirical $n - day$ discounted return distribution. The percentage value-at-risk can be transformed to value-at-risk in value terms: we just multiply it by the current portfolio value.

§ Also known as “innovations”. Here we will use them interchangeably.

** For a more pedagogic review of some of these methodologies (see *Feria Dominguez*, 2005).

†† For further studying about Non-parametric density estimation methods refer to *Bulter* and *Schachter* (1998) or *Rudemo* (1982).

Parametric methods (part of volatility models^{‡‡})

Parametric approaches calculate risk by firstly fitting probability curves to the data and next deducing the value-at-risk from the fitted curve. Among Parametric approaches, the first model to estimate VaR was RiskMetrics™ from *JPMorgan* (1996). This model assumes that the return portfolio add/or the residuals of return follow a normal distribution. Under this assumption, the value-at-risk of a portfolio at a $1 - q\%$ confidence level is calculated as $\text{VaR}(q) = \mu + \sigma_t C^{-1}(q)$, where $C^{-1}(q)$ is the q quantile of the standard normal distribution and σ_t is the conditional standard deviation of the return portfolio. To estimate σ_t , Morgan uses an Exponential Weight Moving Average Model (EWMA). The definition of this model is as follows:

$$\sigma_t^2(1 - \lambda) \sum_{j=0}^{N-1} \lambda^j (\varepsilon_{t-j})^2 \quad (3)$$

where $\lambda = 0.94$ and the window size (N) is 74 days for daily data. Literatures have assigned a few drawbacks to the RiskMetrics that could be briefly listed as following:

- Normal distribution assumption for financial return and/or white-noises (see Bollerslev 1987).
- The model used EWMA to estimate the conditional volatility of the financial returns which it does not take into account symmetry and leverage effect (see Black 1976, Pagan and Schwert 1990)
- iid return assumption.

Given these disadvantages research on the Parametric methods has been made in several directions.

GARCH (1, 1)

In relate to the GARCH family, *Engle* (1982) proposed the “Autoregressive Conditional Heterocedasticity (ARCH), which features a variance that does not remain fixed but rather varies throughout a period”. *Bollerslev* (1986) further expended the model by including in the ARCH generalized model (GARCH). This approach identifies and calculates two equations: the first formulates the evolving volatility of returns, whilst the second sketch the evolution of returns in accord with earlier returns. The most generalized formulation for the GARCH models is the GARCH (p,q) model which is exemplified by the following statement:

$$r_t = \mu_t + \varepsilon_t \quad (4)$$

$$\sigma_t^2 = \omega + \sum_{i=1}^q \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^p \beta_j \sigma_{t-j}^2 \quad (5)$$

Because initially GARCH model do not take into consideration the asymmetric performance of returns before positive or negative shocks (known as *leverage effect*) GARCH technique do not fully reflect the nature forced by the well-known properties of the financial time series, volatility. Meanwhile, they accurately characterize the volatility-clustering feature.

^{‡‡} the volatility models can be divided into three groups: (a) the GARCH fsmily (b) realized volatility-based models and (c) the stochastic models.

DCC-MGARCH model

Multivariate GARCH models, specified in *Engle* (2002), allow the conditional covariance matrix of the dependent variables to follow a flexible dynamic structure and allow the conditional mean to follow a vector autoregressive (VAR) structure. The general MGARCH model can be written as:

$$y_t = Cx_t + \varepsilon_t \quad \text{and} \quad \varepsilon_t = H_t^{1/2}v_t \quad (6)$$

where y_t is a m -vector of dependent variables, m is a $m \times k$ parameter matrix, x_t is a k -vector of explanatory variables, possibly including lags of y_t , $H_t^{1/2}$ is a *Cholesky* factor of the time-varying conditional covariance matrix H_t , and v_t is a m -vector of zero-mean, unit-variance *i. i. d.* Innovations^{§§}.

- EGARCH (1,1)

The Exponential GARCH (EGARCH) model assumes a specific parametric form for this conditional heteroskedasticity. More specifically, we say that $\varepsilon_t \sim \text{EGARCH}$ if we can write $\varepsilon_t = \sigma_t x_t$, where x_t is standard Gaussian and:

$$\ln(\sigma_t^2) = \omega + \alpha(|x_{t-1}| - \mathbb{E}[|x_{t-1}|]) + \lambda x_{t-1} + \beta \ln(\sigma_{t-1}^2) \quad (7)$$

Besides leptokurtic returns, the EGARCH model, as the *GARCH* model, captures other stylized facts in financial time series, like volatility clustering. The volatility is more likely to be high at time t if it was also high at time $t - 1$. Another way of seeing this is noting that shock at time $t - 1$ also impacts the variance at time t .

GJR-GARCH (1, 1)

The *Glosten-Jagannathan-Runkle* GARCH (GJR-GARCH) model assumes a specific parametric form for conditional heteroskedasticity. More specifically, we say that $\varepsilon_t \sim \text{GJR} - \text{GARCH}$ if we can write $\varepsilon_t = \sigma_t x_t$, where x_t is standard Gaussian and:

$$\sigma_t^2 = \omega + (\alpha + \lambda I_{t-1})\varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2 \quad (8)$$

$$\text{where } I_{t-1} = \begin{cases} 0 & \text{if } r_{t-1} \geq \mu \\ 1 & \text{if } r_{t-1} < \mu \end{cases} \quad (9)$$

besides leptokurtic returns, the GJR-GARCH model, like the *GARCH* model, captures other stylized facts in financial time series, like volatility clustering.

§§ A general MGARCH (1,1) model may be written as: $\text{vech}(H_t) = s + A \text{vech}(\varepsilon_{t-1}\varepsilon'_{t-1}) + B \text{vech}(H_{t-1})$ where the *vech* (.) function returns a vector containing the unique elements of its matrix argument. The various parameterizations of MGARCH provide alternative restrictions on H , the conditional covariance matrix, which must be positive definite for all t . Stata's *mgarch* command estimates multivariate GARCH models, allowing both the conditional mean and conditional covariance matrix to be dynamic.

AGARCH (1,1)

AGARCH model besides leptokurtic returns captures other stylized facts in financial time series like volatility clustering.

Consider a return time series (1), where μ is the expected return and ε_t is a zero-mean white noise. Despite being serially uncorrelated, the series ε_t does not need to be serially independent. For instance, it can present conditional heteroskedasticity. The Asymmetric GARCH (AGARCH) model assumes a specific parametric form for this conditional heteroskedasticity. More specifically, we say that $\varepsilon_t \sim \text{AGARCH}$ if we can write $\varepsilon_t = \sigma_t z_t$, where z_t is a standard Gaussian and:

$$\sigma_t^2 = \omega + \alpha(\varepsilon_{t-1} - \lambda)^2 + \beta\sigma_{t-1}^2 \quad (10)$$

there is a stylized fact that the AGARCH model captures effects that is not contemplated by the GARCH model, which is the empirically observed fact that negative shocks at time $t - 1$ have a stronger impact on the variance at time t than positive shocks. This asymmetry is called the leverage effect because the increase in risk was believed to come from the increased leverage induced by a negative shock.

Semi-parametric methods

The Semi-parametric methods concatenate the Non-parametric approach with the Parametric approach. The most important methods are Volatility-weighted Historical Simulation, Filtered Historical Simulation (FHS), CaViaR method and the method based on Extreme Value Theory.

In this paper we will probe properties of the first and the late method. Some application of Volatility-weighted Historical Simulation as well as *CaViaR* methods in VaR literature can be found in the following research papers: *Hull and White* (1998) and *Engle and Manganelli* (2004) respectively. *Hull et al.* indicates that this approach produces a VaR estimate superior to that if the Historical Simulation approach albeit, *Engle et al.* initially fails to provide accurate VaR estimate.

- Filtered Historical Simulation (FHS) with bootstrapping

Barone-Adesi (1999) introduced Filtered Historical Simulation (FHS) for first time. This model combines the benefits of HS with the power and flexibility of conditional volatility models. FHS technique is an alternative to traditional *HS* technique and *Monte Carlo* (MC) simulation approach. Filtered *Historical Simulation* incorporates a nonparametric characteristic of the probability distribution of assets returns with a relatively complex model-based treatment of volatility (e.g. EGARCH). One of the interesting structures of *Filtered Historical Simulation* is its capability to produce reasonably large deviations (losses and gains) not found in the original asset return series. This method assumes that the distribution of returns of assets under examination is initially *i. i. d.* To make the data *i. i. d.* we must fit the first order autoregressive (AR1) model to the conditional mean of the asset returns, which can be formulized as:

$$r_t = c + \phi r_{t-1} + \varepsilon_t \quad (11)$$

and an asymmetric EGARCH model to the conditional variance

$$\log[\sigma_t^2] = \omega + q \log[\sigma_{t-1}^2] + \Phi(|z_{t-1}| - \mathbb{E}[|z_{t-1}|]) + \Psi z_{t-1} \quad (12)$$

the AR(1) model compensates for autocorrelation, whilst the Exponential GARCH model also combines asymmetry (leverage) into the variance equation (Nelson, 2005).

To compensate for the fat tails often related to index returns the standardized residuals of each index are modeled as a standardized Student's t distribution. That is

$$z_t = \frac{\varepsilon_t}{\sigma_t} \text{ i.i.d distribution}(v) \quad (13)$$

Imagine we use FHS to estimate the value-at-risk of a financial asset over a 1-day horizon. The first step in applying this technique is to fit a conditional volatility model to the asset return data. Barone-Adesi et al. (1999) suggested an asymmetric GARCH model. The realized returns are then standardized by splitting each one by the corresponding volatility, $z_t = (\varepsilon_t / \sigma_t)$. These standardized returns should be suitable for HS. The third step consists of bootstrapping a large number L of drawing from the above sample set of standardized returns.

Assuming a 1-day VaR horizon (or holding period), the third stage includes bootstrapping from our data set of standardized returns: we take a large number of drawings from this data set, which we now treat as a sample, substituting each one after it has been producing and multiplying each such random producing by the volatility forecast 1-day ahead:

$$r_t = \mu_t + z^* \sigma_{t+1} \quad (14)$$

where z^* is the simulated standardized return extracted from equation (13). If we take M producings, we therefore obtain a sample of M replicated returns. With this method, the $\text{VaR}(q)$ is the $q\%$ quantile of the calculated return sample^{***}.

Extreme Value Theory (EVT)

EVT approach concentrates on the limiting distribution of extreme returns observed over a long time span, which is indeed independent of the distribution of the returns themselves. The two main models for EVT are (a) the *Block Maxima model* (BM) (McNeil, 1998) and (b) the *Peaks Over Threshold* model (POT). In the POT method, there are two kinds of analysis: the Semi-parametric models built around the Hill estimator and its relatives (Beirlant et al., 1996; Danielsson et al., 1998) and the fully Parametric models based on the *Generalized Pareto Distribution* (GPD) (Embrechts et al., 1999). In this paper we apply POT with analysis type of GPD. In the coming sections each one of these approaches is described.

Detailed description of BM and the Semi-parametric models built around the *Hill estimator* can be found in McNeil (1998) and Beirlant et al (1996), respectively.

Peak Over Threshold model (POT). The POT model is initially said to be the most useful for practical applications because of more efficient use of the data for the extreme values. In this model, we can make a distinction between two types of analysis (a) the fully Parametric models based on the GPD and (b) the Semi-parametric models built around the Hill estimator. In this paper we shall merely introduce the first manner of analysis.

Firstly, in line with FHS method, we applied an EGARCH (1,1) model. The specific parameters of the model chose based on logarithmic returns, so residuals of the model will then

*** To perform this analysis we used code of MATLAB *Statistic Tools*.

become standardized and consequently with this technique we shall gain identically and independently distribution residuals.

Secondly, the standardized identically and independently distributed residuals will be used to generate empirical *Cumulative Distribution* function based on *Gaussian kernel*. Based on general features of financial time series the kernel Cumulative Distributed Function estimation is expected to be well fitted to the interior of the distribution and performing poorly in lower and upper tail (this will be tested whether it will be correct or not for our dataset). For this reason we will implement extreme value theory for all observations that fall in each tail. We select thresholds levels e.g. 10 per cent of data belong to both right and left tail, and then fit the data that satisfy our condition (e.g. fall below defined threshold). This is also known as *peaks over thresholds* or *distribution of exceedances* method (Davison and Smith 1990).

Thirdly, we report value-at-risk of the considered indices at different confidence levels, from very low to very stringent intervals.

Generalized Pareto Distribution (GPD): Among the random variables demonstrating financial returns (r_1, r_2, \dots, r_n) , we pick a low threshold u and examine all values (x) exceeding u : $(x_1, x_2, \dots, x_{N_u})$, where $x_i = r_i - u$ and N_u are the number of sample data greater than u . The distribution of excess losses over the threshold u is defined as:

$$F_u(x) = P(r - u < x | r > u) = \frac{F(x+u) - F(u)}{1 - F(u)} \quad (15)$$

Assuming that for a certain u , the distribution of excess losses above the threshold is a GPD, $G_{k,\xi}(x) = 1 - [1 + (\frac{k}{\xi})x]^{-1/k}$ (28), the distribution function of returns is given by:

$$F(r) = F(x + u) = [1 - F(u)]G_{k,\sigma}(x) + F(u) \quad (16)$$

To build a tail estimator from this statement, the only additional part we need is an calculation of $F(u)$. For this point, we take the evident empirical estimator $(u - N_u)/u$. Next we use the HS method. Presenting the historical estimate of $F(u)$ and setting $r = x + u$ in the equation, we arrive at tail estimator

$$F(r) = 1 - \frac{N_u}{n} [1 + \frac{k}{\xi}(r - u)]^{-1/k} \quad r > u \quad (17)$$

For a given probability $q > F(u)$, the value-at-risk measure is calculated by inverting the tail estimation formula to obtain

$$VaR(q) = u + \frac{\xi}{k} \left[\left[\frac{n}{N_u} (1 - q) \right]^{-k} - 1 \right] \quad (18)$$

Where parameters ξ (shape parameter) and k (scale parameter) are estimated by MATLAB using Newton's method.

Backtesting VaR methodologies

This section presents applied *backtesting* methods to value-at-risk model validation across sample forecast evaluation methods. Failure of backtesting specifies that value-at-risk model misspecification and/or large estimation errors.

According to the endorsements of the Basel Capital Accord in 1996, we shall implement the “backtesting” technique to evaluate the reliability and precision of all model considered.

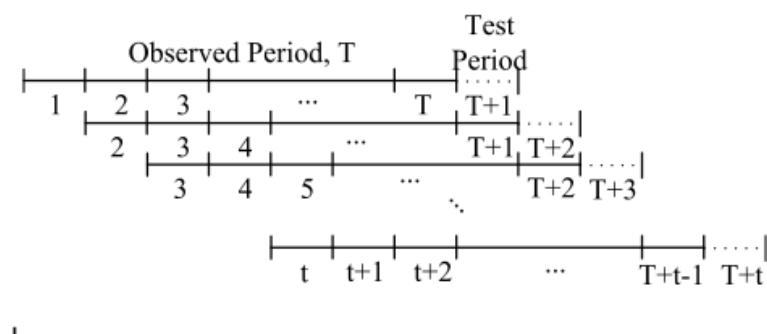


Figure. 1 Sliding window simulation process with estimation and test sample.

Source: Lin et al. (2009) page 2507 with slight modification by the author.

The general simulation process uses the *sliding window*^{†††} methodology. One of the main benefits of this method is that we prevent *overlapping data* in the test sample. First, we determine an *estimation period*, which defines the sample used to calculate the value-at-risk model parameters. Then we employ sliding window approach as follows. The estimation period is progressively moves one time fracture until the end of our testing, keeping the calculating period the same, starting at the beginning of data span. Figure 1 clarifies the rolling window method: the dark grey line at the bottommost shows the entire sample covering the whole data period. The estimation and test samples are shown in grey and dotted line, respectively; during the backtest these are rolled gradually, n day at a time, until whole sample is ended.

In our testing, estimation sample size is 1500 and sample consists of 2774 daily observations and the risk horizon is one day ahead. The backtest proceeds as follows. Use the estimation sample to calculate the one-day VaR_q on the 1500 day. This is value-at-risk one-day return from the 1500th to the 1501th observation. Then, assuming the value-at-risk is stated as a percentage of the asset value, we observe the *realized return* over this one-day test period, and keep both the value-at-risk and the realized return. Then we slide the window forward one-day and iterate the prementioned process, until the entire sample is exhausted. The result of this procedure will be two time series covering the sample from 1501th until the 2774th observation. One series is the one-day value-at-risk and the other is the one-day “realized” return. The backtests is based on these two series.

The conventional tests about *the validity* of value-at-risk models are: (a) unconditional and conditional coverage tests; (b) the backtesting criterion and (c) the dynamic quantile test.

Most often backtests on daily value-at-risk are constructed on the assumption that the daily returns or $P\&L$ are generated by an identically normally independent *Bernoulli process*. A Bernoulli variable can take only two values, which could be labeled 0 and 1, or “failure” and “success”. Thus we may define an *indicator function* as $I_{q,t}$ on the time series of daily returns or $P\&L$ relative to the $q\%$ daily VaR by

^{†††} Another well-known phrase is “rolling window”. In this paper we will use them interchangeably.

$$I_{q,t+1} = \begin{cases} 1, & \text{if } R_{t+1} < -VaR_{1,q,t}, \\ 0, & \text{otherwise.} \end{cases} \quad (19)$$

here R_{t+1} is the “realized” daily return or *P&L* on the portfolio from time t , when the value-at-risk estimate is made, to time $t + 1$.

If the VaR model is accurate and $\{I_{q,t}\}$ follows an *i. i. d.* Bernoulli process, the probability of “success” at any time t is q . Thus the nq is equal to expected number of success in a test sample with n observation. So we can use this information to build a two-sided 95% confidence interval for each of our indices

$$(nq - 1.96\sqrt{nq(1-q)}, nq + 1.96\sqrt{nq(1-q)}) \quad (20)$$

Kupiec (1995) shows that assuming the probability of an exception is constant, then the number of exceptions $x = \sum I_{t+1}$ follows a binomial distribution $B(N, q)$, where N is the number of observations. An accurate VaR (q) measure should produce an *unconditional coverage* ($\hat{q} = \sum I_{t+1}/N$) equal to q percent. The *unconditional coverage test* has a null hypothesis $\hat{q} = q$, with a likelihood ratio statistics:

$$LR_{uc} = 2[\log(\hat{q}^x(1-\hat{q})^{N-x}) - \log(q^x(1-q)^{N-x})] \quad (21)$$

Which follows an asymptotic $\chi^2(1)$ distribution.

Christoffersen (1998) developed a *conditional coverage test*. This jointly examines whether the percentage of exceptions is statistically equal to the one expected and the serial independence of I_{t+1} . He proposed an independence test, which aimed to reject VaR models with clustered violations. The likelihood ratio statistics of the conditional coverage test is $LR_{cc} = LR_{uc} + LR_{ind}$ (22), which is asymptotically distributed $\chi^2(2)$, and the LR_{ind} statistics is the likelihood ratio statistics for the hypothesis of serial independence against first-order Markov dependence.

$$LR_{ind} = -2\log[(1-\hat{q})^{(T_{00}+T_{10})}(\hat{q})^{(T_{01}+T_{11})}] + 2\log[(1-q_0)^{T_{00}}q_0^{T_{01}}(1-q_1)^{T_{10}}q_1^{T_{11}}] \quad (23)$$

Which follows an asymptotic $\chi^2(1)$ distribution.

VaR estimation and backtesting analysis

In this study, we implemented various methods of VaR estimation from all three main categories of VaR estimation techniques namely, Non-parametric methods (Historical Simulation), Parametric methods (GARCH (1,1), DCC-MGARCH, EGARCH, GJR-GARCH, and AGARCH (1,1)) and Semi-parametric methods (Filtered Historical Simulation with bootstrap and Extreme Value Theory).

The data used in estimation and forecasting are daily evolution of returns of 6 indices e.g. Canadian TSX, French CAC40, German DAX, Japanese Nikkei, UK FTSE100 and US S&P500, from 03-June-2003 to 31-March-2014. The index data were obtained from Yahoo Finance for the period June 3, 2003 to March 31, 2014. The computation of the index returns (r_t) is based on the formula $r_t = \ln(I_t/I_{t-1}) \times 100$, where I_t is the value of the stock-market index for period t .

Preliminary statistics for the data are presented in the inner box of figure 1. For all indexes, the unconditional mean of daily log-returns is close to zero. The maximum and minimum values are between -9.78% and 9.37% for the TSX index. The skewness statistics are negative for the Nikkei (-0.571), FTSE (-0.157), S&P (-0.336) and positive for the TSX (0.739) and CAC (0.040) and DAX (0.011). For most indexes considered, these values are very close to zero, implying that the distributions of these returns are not far from symmetric.

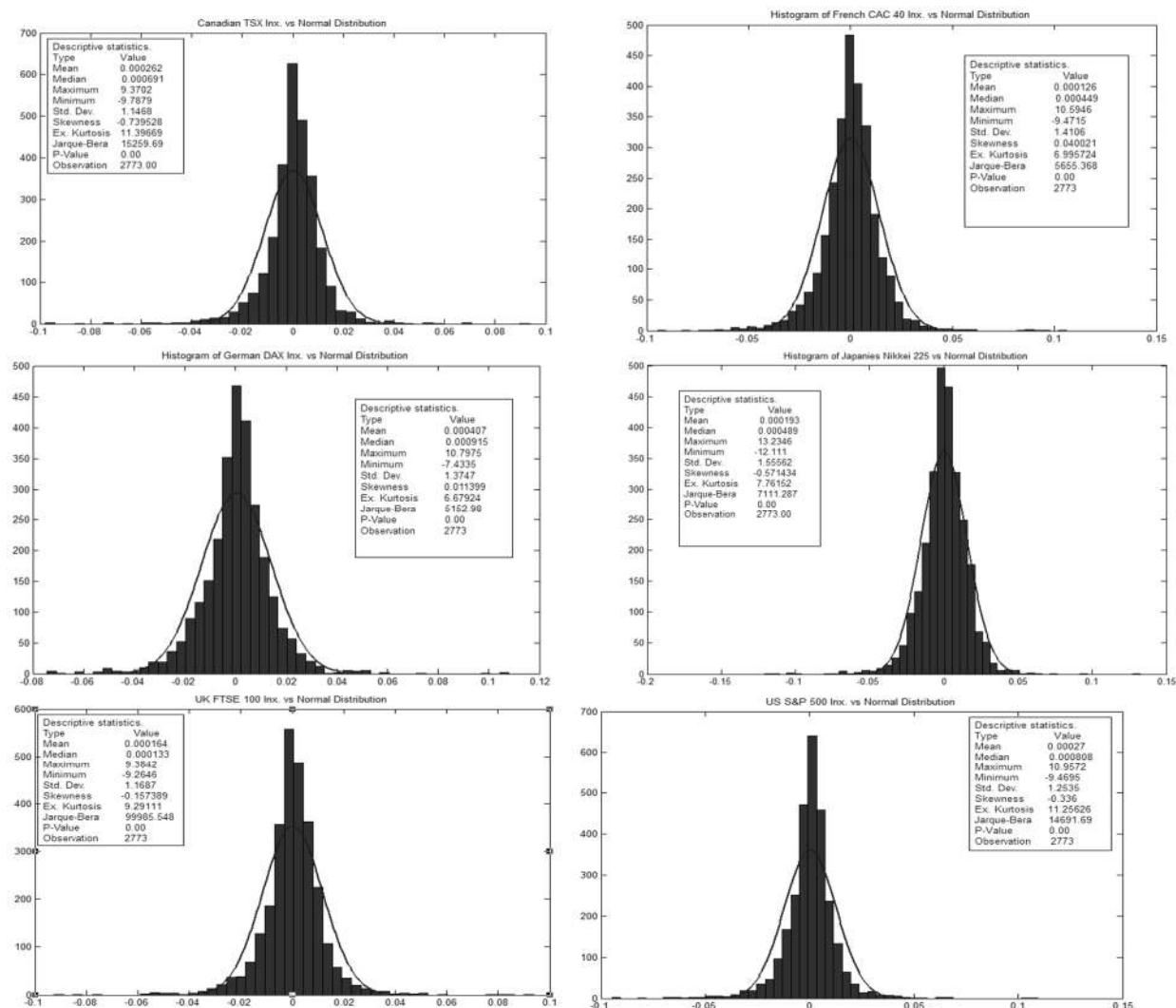


Figure. 2: Histograms and Normal distribution. The histograms and theoretical normal (red line) returns of stocks indexes. Sample run from June 3, 2003 to March 31, 2014. Visually we can claim that the distribution of all indices is similar to a *t-student* distribution. Additionally, descriptive statistics calculated for the whole period is reported in small boxes. The values of Kolmogorov-Smirnov test is also lower than 5% (is not reported).

Source: Own study.

Fig. 1 shows the histograms for each index with the theoretical Gaussian and *t*-Student probability density functions. These histograms seem symmetric. Therefore, in this paper, we consider only symmetric distributions. For all of the considered indices, the excess kurtosis statistics is very large, implying that the distribution of these returns has a much thicker tail than the normal distribution. Similarly, the Jarque-Bera statistics is also very large and statistically significant, disallowing the assumption of normality.

The outcome of daily various VaR methods based on a range of confidence levels for the TSX, CAC40, DAX, Nikkei, FTSE100, S&P500 are reported in table 1.

Table 1: Values of VaR estimated based on various techniques - from a low to a high level of confidence.

Quantile	Index	HS	GARCH	M-GARCH	E-GARCH	GJR-GARCH	A-GARCH	FHS	EVT
90%	TSX	1,13%‡	1,13%	1,13%	1,07%	0,98%	1,01%	1,12%	1,13%
	CAC	1,49%	1,48%	1,48%	1,40%	1,47%	1,49%	1,53%	1,49%
	DAX	1,50%	1,50%	1,50%	1,47%	1,37%	1,47%	1,50%	1,50%
	Nikkei	1,68%	1,69%	1,69%	1,76%	1,60%	1,67%	1,72%	1,69%
	FTSE	1,17%	1,16%	1,16%	1,04%	0,97%	1,09%	1,20%	1,17%
	S&P	1,21%	1,20%	1,20%	1,12%	0,98%	1,06%	1,24%	1,21%
95%	TSX	1,75%	1,76%	1,75%	1,59%	1,17%	1,60%	1,67%	1,75%
	CAC	2,23%	2,20%	2,18%	2,07%	2,11%	1,10%	2,25%	2,23%
	DAX	2,12%	2,11%	2,11%	2,12%	1,87%	1,12%	2,22%	2,12%
	Nikkei	2,37%	2,36%	2,36%	2,51%	2,27%	1,43%	2,42%	2,37%
	FTSE	1,78%	1,75%	1,75%	1,55%	1,19%	1,37%	1,78%	1,79%
	S&P	1,84%	1,85%	1,84%	1,58%	1,29%	1,23%	1,90%	1,85%
97.5%	TSX	2,20%	2,18%	2,18%	1,88%	1,50%	1,58%	2,09%	2,21%
	CAC	2,77%	2,77%	2,76%	2,51%	2,65%	2,52%	2,81%	2,77%
	DAX	2,54%	2,52%	2,52%	2,64%	2,39%	2,51%	2,78%	2,55%
	Nikkei	2,89%	2,89%	2,88%	3,17%	2,73%	2,80%	2,94%	2,90%
	FTSE	2,34%	2,26%	2,26%	1,92%	1,57%	2,20%	2,24%	2,34%
	S&P	2,40%	2,39%	2,39%	2,01%	1,70%	2,35%	2,43%	2,41%
99%	TSX	3,48%	3,42%	3,39%	2,86%	2,42%	2,73%	3,10%	3,49%
	CAC	4,06%	3,97%	3,94%	3,44%	4,01%	4,07%	4,16%	4,08%
	DAX	4,10%	3,94%	3,91%	4,03%	3,58%	3,30%	4,12%	4,12%
	Nikkei	4,33%	4,26%	4,24%	5,20%	4,22%	5,04%	4,11%	4,34%
	FTSE	3,24%	3,19%	3,19%	2,20%	2,17%	2,30%	3,32%	3,26%
	S&P	3,78%	3,69%	3,63%	2,50%	2,55%	2,49%	3,72%	3,86%
99.95%	TSX	9,69%	8,95%	8,76%	7,74%	17,76%	15,39%	9,43%	9,79%
	CAC	9,08%	8,66%	8,54%	10,76%	10,12%	11,04%	12,59%	9,47%
	DAX	7,41%	7,39%	7,38%	12,49%	7,75%	12,36%	12,52%	7,43%
	Nikkei	11,85%	10,80%	10,45%	27,25%	23,18%	24,08%	12,70%	12,11%
	FTSE	8,96%	8,29%	8,17%	6,22%	6,29%	6,12%	10,44%	9,26%
	S&P	9,44%	8,83%	8,70%	6,55%	6,76%	6,59%	12,92%	9,47%

‡ it shows that with 90% confidence interval VaR of TSX index would not exceed 1.13% in next day. In other words, the loss of TSX index will not exceed more than 1.13% of its value one-day horizon.

Source: own study.

In this section we would like to explain in details the way we calculated VaR of the two most sophisticated methods e.g. Filtered Historical Simulation with bootstrap and then Extreme Value Theory.

Filtered Historical Simulation with Bootstrap technique

No dividend adjustments are explicitly taken into account. Then with encoding equation (12) in MATLAB we model an asymmetric Exponential GARCH model to the conditional variance. Next step is to implement code segment calculate the autoregressive order (1) plus Exponential GARCH (1, 1) model. So, implementing this technique will enable us to extract the filtered residuals and conditional variance from each index return. Obtaining filtered the model innovation from the indices return series; standardize each innovation by the corresponding conditional standard deviation. These SIs represent the underlying unit-variance, zero-mean, *i. i. d.* series. The *i. i. d.* character is necessary for bootstrapping, and lets the sampling procedure to safely prevent the drawbacks of sampling from a population in which consecutive observations are serially dependent. To make the innovations standardized we shall apply equation (13).

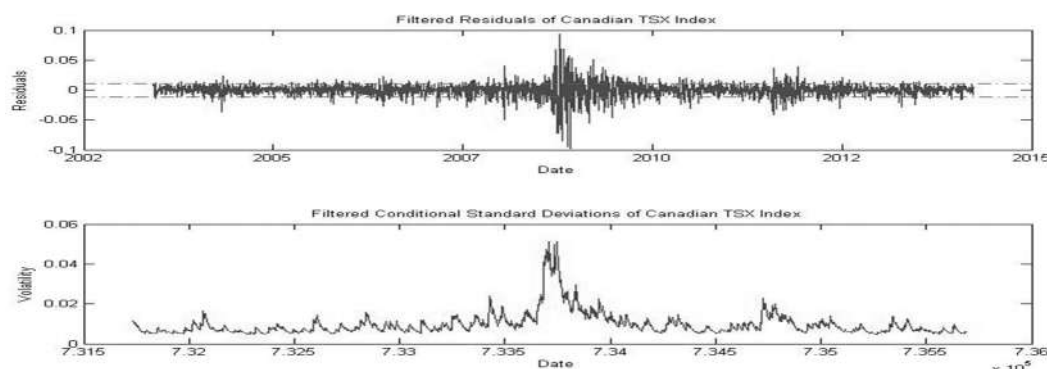


Figure 3: Plot of filtered residuals and volatility. The bottom plot exhibits existence of heteroskedasticity in the filtered residuals. The lower graph clearly illustrates the variations in volatility (heteroskedasticity) present in the filtered residual.

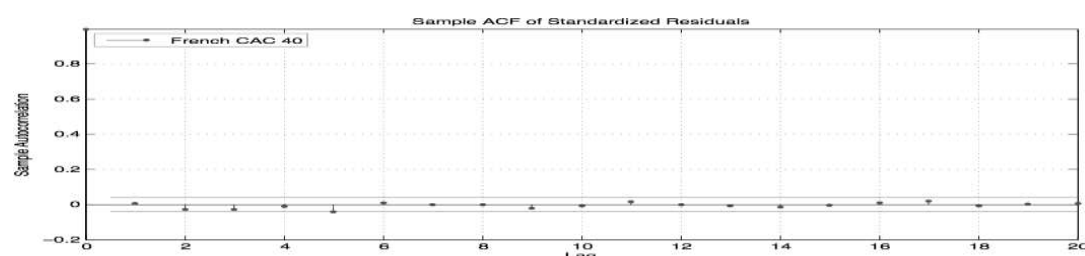


Figure 4: Sample ACF of French CAC index standardized residuals (similar results obtained for the rest of series).

As cited in section II, filtered historical simulation bootstraps SIs to create paths of future asset returns and, hence, makes no parametric assumptions about the probability distribution of those returns.

The bootstrapping procedures *i. i. d.* SIs is in line with those obtained from the AR(1)-EGARCH(1,1) filtering process above. Exploiting the bootstrapped SIs as the identically and independently distribution input noise process, reestablish the autocorrelation and heteroskedasticity observed in the original index return series via the Econometrics Toolbox™ filter function. Obtaining simulated the returns of indices report the estimated value-at-risk at various confidence levels, over the one-day risk horizon is reported in Table 1 Part C.

For instance, based on filtered historical simulation method- Table 1 part C- figure 1.12% represent the value-at-risk of Canadian TSX index with 90 per cent confidence level, over one day horizon. In other words, it means that only with ten percent probability the VaR of Canadian TSX with exceed from 1.12% of its value over one-day horizon.

Extreme Value Theory

As mentioned in section II modeling the tails of a distribution with a generalized Pareto distribution necessitates the data under examination to be *approximately i. i. d.* To do so, we shall implement the same procedure similar to section II equations 13,14, and 15 in MATLAB to obtain our desirable data series. Results of Japanese Nikkei 225 index are summarized in figure 2. Results for rest of data e.g. Canadian TSX index, French CAC 40 index, German DAX index and US S&P 500 index can be found in appendix.

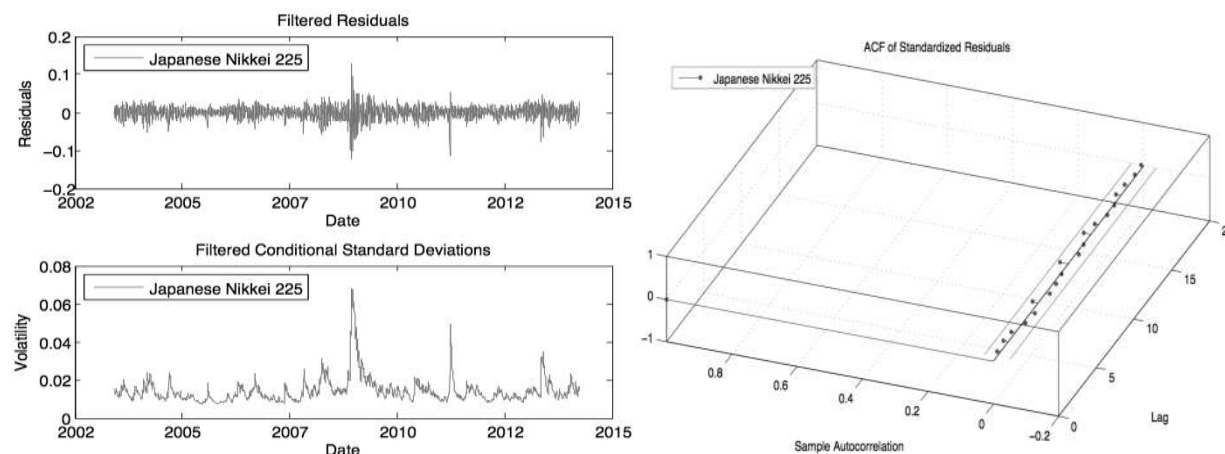


Figure 5: (Left) Filtered residuals and filtered conditional standard deviations of Japanese Nikkei 225 index. (Right) Shows the 3D ACF of standardized residuals of Japanese Nikkei index.

Having the standardized, identically and independently distribution of innovations from the previous stage, calculate the empirical cumulated distribution function of each index with a Gaussian kernel. This smoothes the cumulative distribution function estimates, removing the staircase shape of unsmoothed sample cumulated distribution functions. Although non-parametric kernel cumulated distribution function estimates are well fitted for the interior of the distribution where most of the data is concentrated, they tend to perform weakly when implemented to the upper and lower tails. Implement Extreme Value Theory to those innovations that fall in each tail to suitably calculate the each tail of the distribution. Precisely, find upper and lower u (threshold, the main function of) in implementation of equations 19,20,21, and 22 such that 10 per cent^{†††} of the innovations in this paper are reserved for each tail. Afterward, based on mentioned method in section II, we shall apply Peak Over Threshold method as following.

Fit the amount by which those extreme innovations in each tail fall above the determined u to a parametric generalized Pareto distribution by maximum likelihood. Finally given the exceedances in each tail, optimize the negative log-likelihood function to estimate the shape parameter (ξ) and sclae parameter (k) via MATLAB Econometrics ToolboxTM and then plug their values in equation (18) to estimate VaR based on EVT with difference confidence level over one-day horizon. The results of implementing previous steps on Japanese Nikkei 225 index are summarized as it is depicted in table 1, Part D, that summarizes the estimated VaR of indices considered based on EVT for different confidence level for one-day horizon. For instance, figure 4,12% refers to VaR of German DAX index with 99% confidence level. In other words, it states

^{†††} The value of threshold is optional. Though, the sample mean excess function (MEF) is applied in some papers to determine the value of threshold more appropriately. Additionally, Neftci 2000 proposed another methods in his paper.

that with 99% confidence level VaR of DAX index will not exceed 4,12% of value of German DAX index over next trading day.

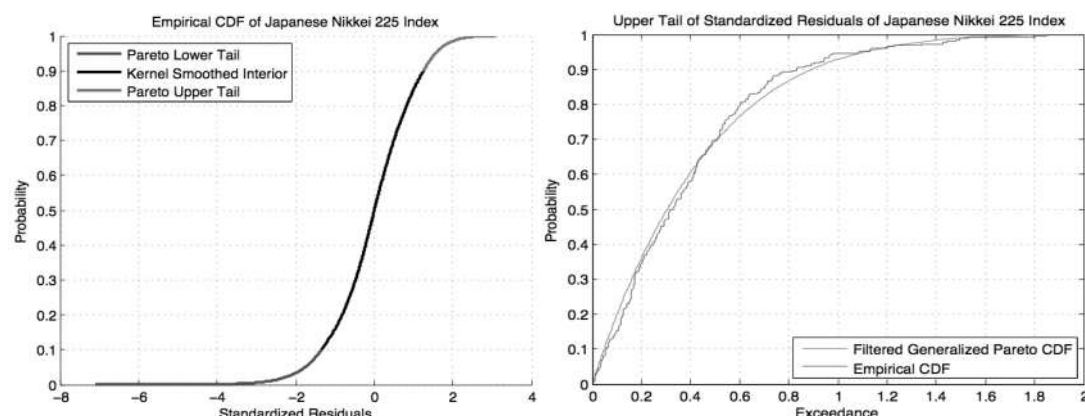


Figure 11: (Right)Empirical CDF of Japanese Nikkei 225 index. Plot of Pareto lower and upper tails. (Left) Shows Filtered Generalized Pareto CDF vs. empirical CDF of Japanese Nikkei index.

Source: own study

Backtesting results.

The VaR estimates, on April 01 2014, for all indices based on implementing methods considered, are presented in previous sections, whereas their test sample performance is evaluated in tables 2 and 3. This evaluation is based on one-step-ahead forecasts that have been produced from a series of rolling samples with a size 1500 observation and we shall base test on the 10%, 5%, 2.5%, 1% and 0.05% daily VaR for various methods and test have been suggested in section II.5 for evaluating VaR model accuracy. In this paper, we implement tests (equations 21 and 22) for covering probability.

In Table 5, we present the test statistics for the conditional test sample performance of various methods considered. The main evidence from this backtesting exercise is that the models perform equally well at low confidence level (e.g. from 90% up to 97.5%). However from the 99% level and beyond the superiority of the extreme values technique clearly emerges since it is the only method where not a single case exists with statistically significant forecasting failures. Looking at the all indices, except EVT, Historical Simulation and Filtered Historical Simulation also performed very satisfactory which were beyond expectation. Historical Simulated estimate VaR of four indices for all confidence intervals precisely, namely TSX Canadian Index, French CAC 40 index, German DAX and Japanese Nikkei 225 index. Filtered Historical Simulation, except one case, estimated VaR in all confidence level and for all indices precisely.

In this experiment among all GARCH model, only GARCH (1, 1) model and to some lower extend MGARCH perform accurate. The results for EGARCH and GJR-GARCH are really poor in our experiment for all indices.

Likelihood ratio tests statistics for the conditional LR_{cc} , Equation (26), out-of-sample performance of various methods in different confidence level of indices considered.

Model	p	90%	95%	97,50%	99%	99,95%
	test	LRcc	LRcc	LRcc	LRcc	LRcc
HS	TSX	0,25	0,02	1,09	3,53	0,42
	CAC 40	1,25	0,12	0,26	3,22	0,38
	DAX	0,74	0,92	2,71	0,17	0,38
	Nikkei 225	0,34	0,74	2,6	3,24	0,38
	FTSE 100	0,34	0,23	1,09	1,23	17,05
	S&P 500	0,73	0,01	1,04	5,23	2,36
GARCH (1,1)	TSX	0,04	0,53	1,08	4,82	1,8
	CAC 40	0,72	0,09	0,37	0,42	0,53
	DAX	0,12	0,04	0,34	0,01	2,83
	Nikkei 225	0,15	0,89	1,24	0,03	2,83
	FTSE 100	0,01	1,01	1,24	1,45	1,03
	S&P 500	2,34	1,34	1,24	2,87	0,02
DCC-M GARCH	TSX	0,17	0,76	7,75	0,83	0,62
	CAC 40	0,04	5,87	1,71	0,28	0,62
	DAX	0,34	0,24	0,71	0,92	0,34
	Nikkei 225	0,06	0,23	3,24	1,05	0,71
	FTSE 100	1,37	0,23	3,22	0,33	3,34
	S&P 500	0,06	2,2	0,15	0,02	1,05
EGARCH(1,1)	TSX	0,74	2,5	0,02	4,53	9,33
	CAC 40	0,01	0,01	0,02	0,48	32,25
	DAX	0,08	3,33	2,94	0,42	13,28
	Nikkei 225	0,22	0,02	1,64	0,01	21,03
	FTSE 100	0,24	0,02	1,85	9,52	14,42
	S&P 500	2,9	0,02	20,04	7,97	17,93
GJR-GARCH (1,1)	TSX	0,19	1,08	2,95	0,37	23,84
	CAC 40	1,53	1,08	1,98	0,51	18,93
	DAX	7,39	2,34	1,68	0,51	18,03
	Nikkei 225	0,33	0,67	1,03	4,67	12,04
	FTSE 100	0,19	0,98	5,48	1,53	25,25
	S&P 500	0,18	0,67	11,03	9,33	21,93
FHS	TSX	2,01	1,45	1,13	0,01	9,33
	CAC 40	0,47	0,02	0,13	0,67	1,38
	DAX	0,08	3,65	0,72	0,31	0,02
	Nikkei 225	0,01	0,01	0,02	0,22	1,36
	FTSE 100	0,67	0,01	1,84	1,33	0,83
	S&P 500	0,35	0,23	0,17	1,98	1,25
EVT	TSX	0,89	0,89	0,17	1,22	0,28
	CAC 40	0,34	1,08	0,17	1,22	0,23
	DAX	0,15	1,09	1,44	0,03	0,07
	Nikkei 225	0,54	2,67	0,73	1,02	0,05
	FTSE 100	1,26	1,07	1,95	1,62	0,05
	S&P 500	0,73	0,17	2,03	0,62	0,23

Table 2: Backtesting period: January 04, 2009 to March 31, 2014. Red numbers indicate significance at the 95% level. LR_{cc} is χ^2 with 2 DoF.

Source: own study.

Number of exceedances, F, and 95% LR_{uc} non-rejection confidence regions for indices considered.

Index	Quantile	Failure (LRuc)	HS	GARCH(1,1)	MGARCH	EGARCH	GJR-GARCH	AGARCH	FHS	EVT
TSX	90%	11<F<29	22	20	21	27	27	24	19	19
CAC			17	18	18	23	27	19	20	19
DAX			21	20	16	19	18	22	22	19
Nikkei			16	18	16	21	24	20	15	17
FTSE			19	21	24	22	19	21	20	20
S&P			18	17	23	19	26	26	21	23
TSX	95%	7<F<23	14	12	17	19	19	14	13	16
CAC			9	11	15	15	17	19	13	14
DAX			11	12	13	16	16	11	14	13
Nikkei			13	12	11	19	17	18	14	14
FTSE			10	13	12	17	19	18	15	16
S&P			14	12	11	15	15	16	14	16
TSX	0,9750	3<F<12	7	9	10	12	13	10	8	7
CAC			5	10	9	9	9	9	7	9
DAX			6	9	8	8	10	12	10	10
Nikkei			6	9	11	12	10	9	8	9
FTSE			8	11	10	12	12	7	9	9
S&P			7	8	8	11	12	11	8	10
TSX	0,9900	F<8	2	8	2	8	9	8	2	1
CAC			3	2	2	8	5	8	1	1
DAX			2	2	1	2	8	5	2	0
Nikkei			2	1	2	9	2	3	2	0
FTSE			1	2	1	8	8	6	1	1
S&P			2	2	1	9	8	9	2	1
TSX	0,9950	F<2	0	2	2	3	2	3	1	0
CAC			1	2	2	2	2	2	1	0
DAX			0	1	0	2	2	2	2	0
Nikkei			0	2	1	2	2	3	1	0
FTSE			2	2	2	3	3	2	1	0
S&P			1	1	0	3	2	2	2	0

Table 3: Backtesting sample period: April 01, 2009 to March 31 2014. Red figures indicate statistically significant underestimation or overestimation of value-at-risk. F is the number of failures that could be observed without rejecting the null that the models are correctly calibrated at the 95% level of confidence.

In Table 3, we present the number of exceedances in each case and compare them with an interval of numbers that would be consistent with the probability level under which the VaR estimates have been produced. Those intervals for LR_{uc} test have been derived from equation (20). Again, we reconfirm for all indices the previous results whereas at high confidence levels the EVT method are generating the best performance. The Parametric models have also recorded a similar failure whilst, Historical Simulation and Filtered Historical Simulation recorded a much better results.

Summary of results and conclusion

Value-at-Risk (VaR) is one of the most popular risk measures used in realm of finance. The precise estimation of VaR is a crucial task for any financial institution, in order to arrive at the accurate capital requirement in response to framework of Basel II and meet the adverse behaviour of the market. We have illustrated the implementation of Historical Simulation, GARCH, EGARCH, AGARCH, GJR-GARCH, DCC-MGARCH, Filtered Historical Simulation and

finally Extreme Value Theory that are a combination of traditional and new tools toward risk measurement in a univariate distribution framework. There are different attitudes toward estimating Value-at-Risk, and most of them falsely assume that stock returns come from a normal distribution or multivariate normal distribution in the case stock portfolio. The three approaches that we illustrated in this paper are (a) Parametric approach that uses a long series of stock return, giving the same weight to each of them, assumes that the empirical distributions observed in the past mirrors future changes, (b) Non-parametric approach in which assume some assumption associated with behavior of stock returns. For instance, in this approach they assign the parameter of β to market risk as well as parameter λ to leverage effect and (c) Semi-parametric method that uses the non-parametric empirical distribution to capture the small risks and the parametric method based on EVT to capture large risks in result of rare events.

The use of EVT in the model improves the calculating of value-at-risk for extreme quantile because apart from modeling the fat tails it permits for extrapolation in the tails above the data series.

Our major conclusion is that the EVT outperform other techniques considered in this paper.

However Extreme Value Theory suffers from strong statistical underpinning and requiring a high level of programing and modeling skills either in MATLAB or R, meanwhile results are completely satisfactory and consistently reliable in different business cycles especially for high volatility periods. In our experience for a moderately calm period ,Apr. 2014, we estimate VaR of S&P 500 equal to 9.47 per cent with 99.95 per cent confidence level which seems reasonable for movements of these days stock indices and is in line with results of Berger (2013), Brooks et al. (2005), Neftci (2000), Raggad (2009), Lin et al., (2009), Bali (2007), Stelios et al. (2005), Abad et al., (2012), among others. And in line with Raggad (2009) Filtered historical Simulation and Historical Simulation perform satisfactory especially from low level of confidence, 90% to rather high level of confidence 99%.

All in all in our experiment, GARCH models did not exhibits a good performance in estimating VaR. meanwhile, GARCH (1, 1) and MGARCH exhibits a better performance especially in lower confidence level. My intuition about the reason for poor performance of GARCH can be probed in our data. It is fact that GARCH model are persistent to unordered movements in stock returns. Inclusion of a high volatile period like wake of 2008 financial crisis in our data negatively affects on predictability power of almost all GARCH models. Since in section II we detected property of leptokurtosis and negative skewness among the data and when the function form of parametric distribution has leptokurtosis and negative skewness, the empirical value-at-risk estimated at high confidence level (97.5, 99, 99.95) was greater than the VaR estimated by non-parametric and Semi-parametric methods. However, the opposite is yet correct at the lower confidence levels (0.90 and 0.95) in our experiment.

In this step, we find it suitable to suggest future research based on GARCH model if they want to estimates VaR for short-period it is better to take a shorter horizon time maximum 5 years to data under examination be a good representative of current market status. Because it is hardly possible that equity markets will return to their previous levels of volatility such as 2008 credit crisis within a short risk horizon like one or even next 10 trading days.

We suggest, for further research, to probe the performance of GARCH models in two homogeneous periods. A calm and a volatile period and compare their result of performance of GARCH model in each period.

Furthermore, we suggests that further work needs to be done to test the sensitivity of EVT model based on the choice of threshold level, u ,.

References

- Abad A., Benito S., López L. (2013). A comprehensive review of Value at Risk methodologies, *Journal of the Spanish Financial Econometrics*.
- Andersen T. G., Bollerslev T. (1998). Answering the Skeptics: Yes, Standard Volatility Models do Provide Accurate Forecasts, *International Economic Review*, Vol. 39, No. 4.
- Bali R. (2003). Seasonality in ex dividend day returns, *Applied Economics Letters*, Vol. 10, No. 14.
- Barone-Adesi G., Giannopoulos K., Vosper L. (1999). VaR without correlations for nonlinear portfolios, *Journal of Futures Markets* 19, pp. 583–602.
- Black, F. (1976). Studies in stock price volatility changes. In: *Proceedings of the 1976 Business Meeting of the Business and Economics Statistics Section, American Association*, pp. 177–181.
- Beirlant J., Teugels J.L., Vyncker P. (1996). *Practical Analysis of Extreme Values*. Leuven University Press, Leuven, Belgium.
- Bollerslev, T. (1987). A conditionally heteroskedastic time series model for speculative prices and rates of return, *Review of Economics and Statistics* 69, pp. 542–547.
- Bollerslev T. (1986). Generalized Autoregressive Conditional Heteroskedasticity, *Journal of Econometrics* 31, 307–327, North-Holland.
- Boudoukh J., Richardson M., Whitelaw R. (1998). The best of both worlds, *Risk* 11(May), pp. 64–67.
- Brooks C., Clare A.D., Dalle Molle J.W., Persaud G. (2005). A comparison of extreme value theory approaches for determining value at risk, *Journal of Empirical Finance* 12, 339–352.
- Butler, J.S., Schachter, B. (1998). Estimating value at risk with a precision measure by combining kernel estimation with historical simulation, *Review of Derivatives research* 1, pp. 371–390.
- Dave R., Stahl G. (1997). On the accuracy of VaR estimates based on the variance-covariance approach, mimeo, Olsen & Associates.
- Davison A. C. (1990). Models for Exceedances over high thresholds, *Journal of the Royal Statistics Society*, Vol. 52, No. 3, pp. 393–442.
- Ding Z., Granger C.W.J, Engle R. F. (1993). A long memory property of stock market returns and a new model, *Journal of Empirical Finance* 1, pp. 83–106, North-Holland.
- Engle, R., Manganelli, S. (2004). CAViaR: conditional autoregressive value at risk by regression quantiles. *Journal of Business & Economic Statistics* 22, 367–381.
- Engle R. (2002). Dynamic conditional correlation – A simple class of Multivariate GARCH models, *Journal of Business and Economic Statistics*.
- Engle R. (1982). Autoregressive Conditional Heteroscedasticity with Estimates of the Variance of United Kingdom Inflation, *Econometrica*, Vol. 50, No. 4., pp. 987–1007.
- Fernandez V. (2005). The International CAPM and a wavelet-based decomposition of Value at Risk, *Documentos de Trabajo* 203, Centro de Economía Aplicada, Universidad de Chile.
- Gencay, Ramazan, Selcuk, Faruk. (2006). "Overnight borrowing, interest rates and extreme value theory", *European Economic Review*, Elsevier, vol. 50(3), pages 547–563, April.
- Gencay, Ramazan, Selcuk, Faruk. (2004). Extreme value theory and Value-at-Risk: Relative performance in emerging markets, *International Journal of Forecasting*, Elsevier, vol. 20(2), pages 287–303.
- Glosten L. R., Jagannathan R., Runkle D. E. (1993). On the Relationship between the Expected Value and the Volatility of the nominal Excess Return on Stocks, *The Journal of Finance*, Vol. 48, no. 5, pp. 1779–1801.
- Hull, J., White, A. (1998). Incorporating volatility updating into the historical simulation method for value-at-risk, *Journal of Risk* 1, pp. 5–19.
- Jorion, P. (2001). *Value at Risk: The New Benchmark for Managing Financial Risk*. McGraw-Hill.
- Jorion, P. (1997). *Value at Risk: The New Benchmark for Controlling Market Risk*. Irwin, Chicago, IL.
- Jorion, P. (1990). The exchange rate exposure of U.S. multinationals. *Journal of Business* 63, pp. 331–345.
- J.P.Morgan, RiskMetrics - Technical documents.
- McNeil A. (1998). Calculating Quantile Risk Measures for Financial Time Series Using Extreme Value Theory. Department of Mathematics, ETS, Swiss Federal Technical University E-Collection, <http://e-collection.ethbib.ethz.ch/>
- Marohn, F. (2005). Tail index estimation in models of generalized order statistics, *Communications in Statistics: Theory & Methods*, 34:5, pp. 1057–1064.
- Merton R. C., 1980, ON ESTIMATING THE EXPECTED RETURN ON THE MARKET, *Journal of Financial Economics* 8, pp. 323–361, North-Holland Publishing Company.
- Neftci, S.N. (2000). Value at Risk calculations, extreme events, and tail estimation. *The Journal of Derivatives* 7, 23–37.
- Nelson, Daniel B. (2005). Conditional heteroskedasticity in asset returns: a new approach, *Econometrica*, vol. 59, No.2, 347–370.

- Pagan, A., Schwert, G. (1990). Alternative models for conditional stock volatility. *Journal of Econometrics* 45, pp. 267–290.
- Perignon, C., Smith, D. (2010). The level and quality of Value-at-Risk disclosure by commercial banks, *Journal of Banking and Finance* 34, pp. 362-377.
- Taylor S.J., Xu X. (1997). The incremental volatility information in one million foreign exchange quotations, *Journal of Empirical Finance* 4, pp. 317-340.
- Zakoian J. M. (1994). Threshold heteroskedastic models, *journal of European Dynamics and Control*, Vol. 18, Issue 5, pp. 931-955.

Appendix

Table 1: Lagged daily return

s regression of French CAC 40 Index.

	<i>Coefficients</i>	<i>SE</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.000	0.000	0.503	0.614	0.000	0.000
Lagged return	0.052	0.018	2.753	0.005	0.089	0.015

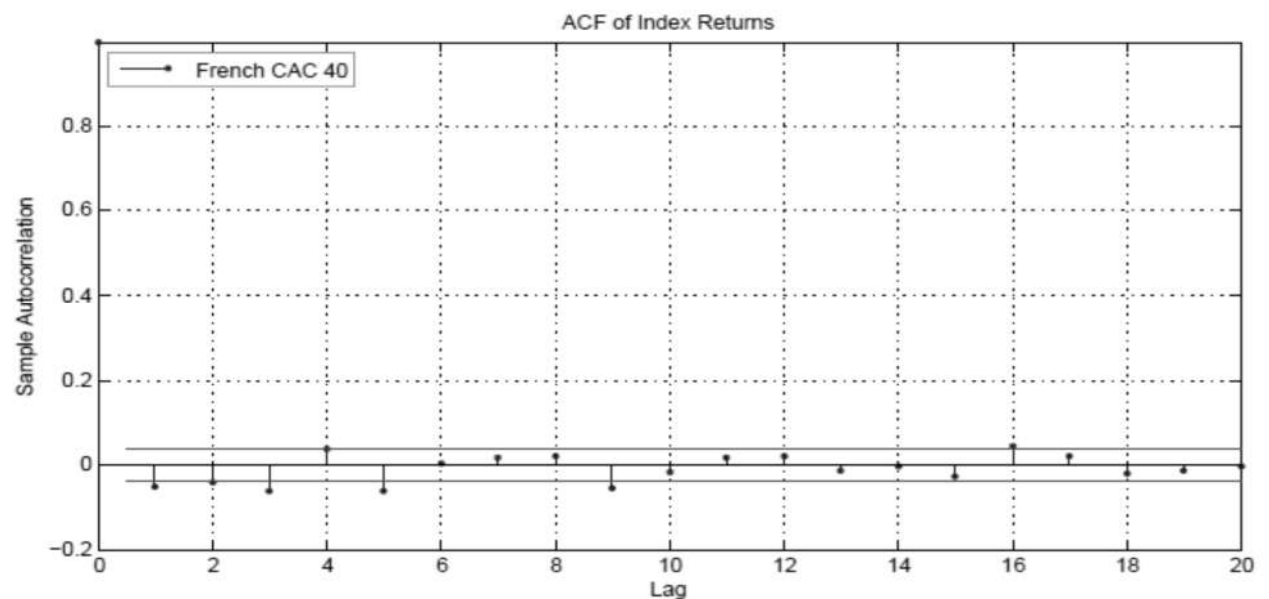


Figure 1: ACF of CAC 40 Index. It reveals that just first lag crosses the 95% bounds.

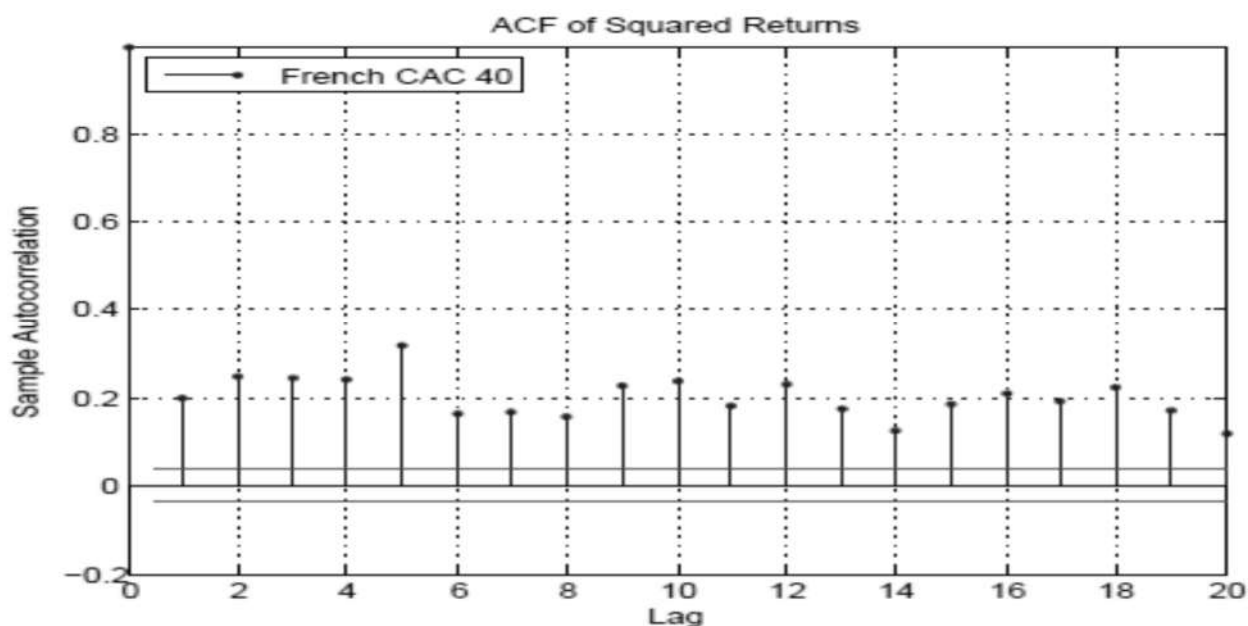


Figure 2: The sample ACF of the squared returns illustrates the degree of persistence in variance.

Table 2: Lagged daily returns regression of German DAX index

	<i>Coefficients</i>	<i>SE</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.000	0.000	1.570	0.116	0.000	0.000
Lagged return	0.006	0.019	0.341	0.732	0.043	0.030

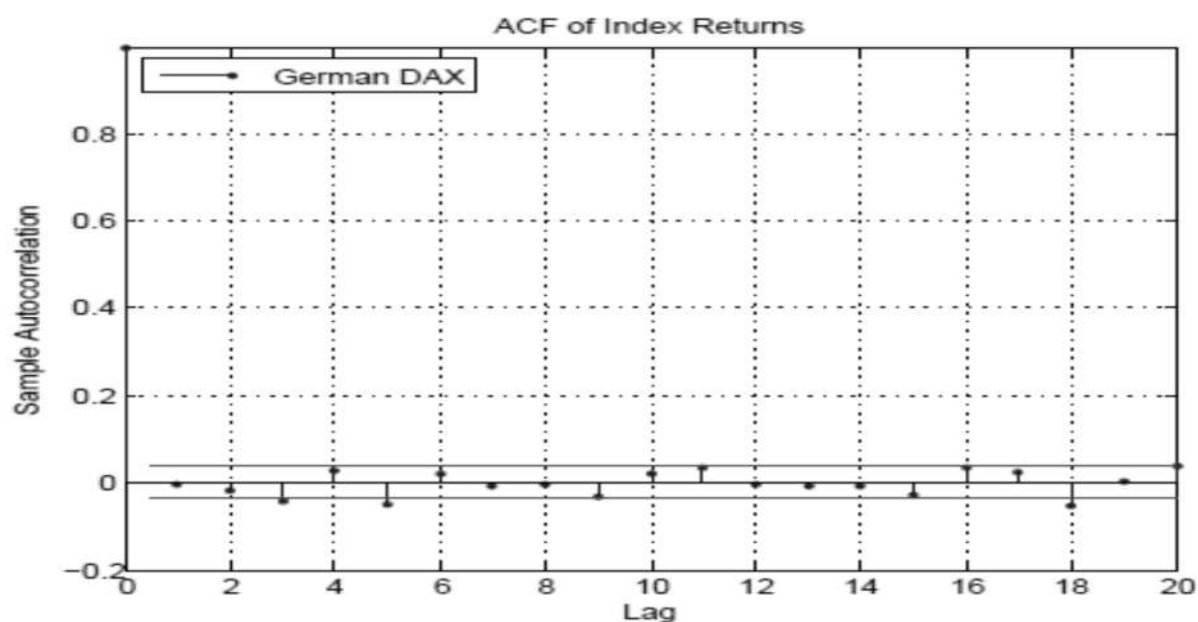


Figure 3: ACF of German DAX index shows breaking 95% bounds in several times.

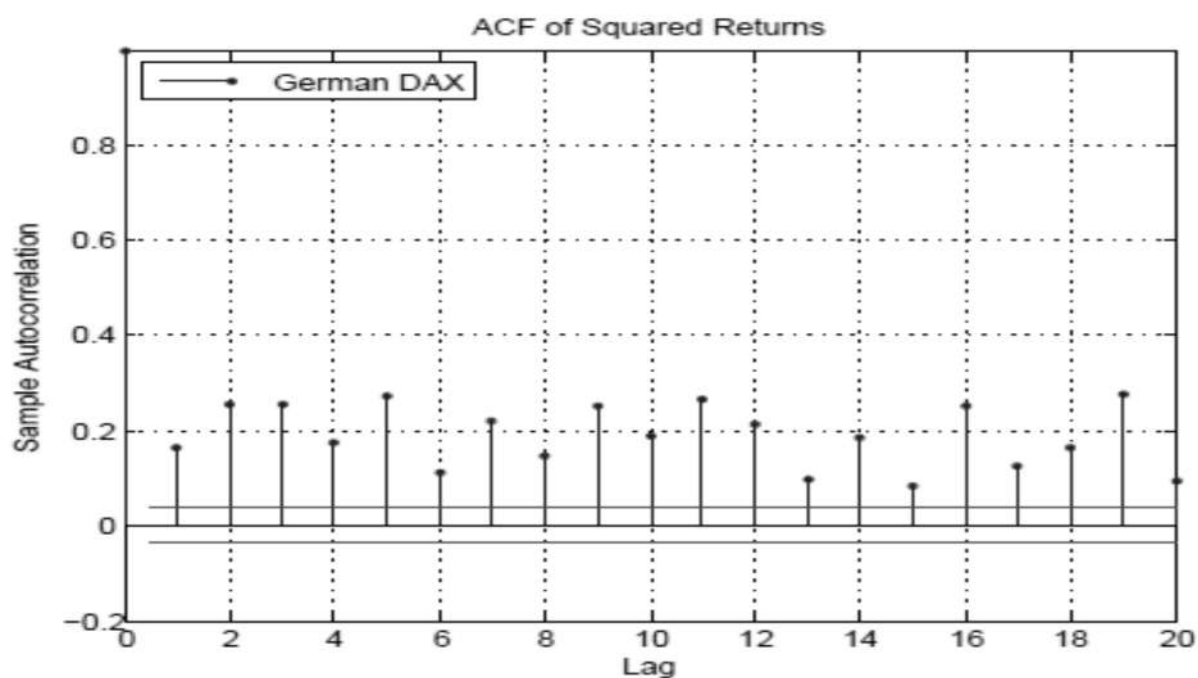


Figure 4: The sample ACF of the squared returns illustrates the degree of persistence in variance.

Table 3: Lagged daily returns regression of Japanese Nikkei 225 index.

	<i>Coefficients</i>	<i>SE</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.000	0.000	0.676	0.498	0.000	0.000
Lagged return	0.035	0.018	1.85	0.051	0.072	0.001

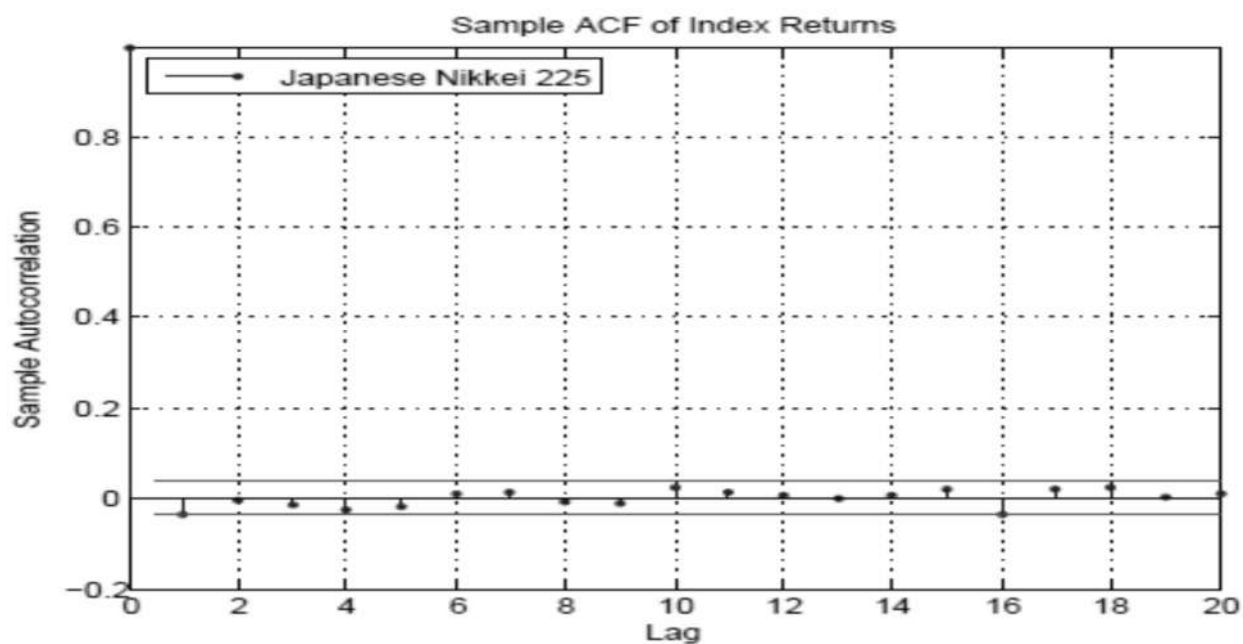


Figure 5: ACF of Japanese index really closing to beating 95% bounds just in first lag with p-value close to 5%.

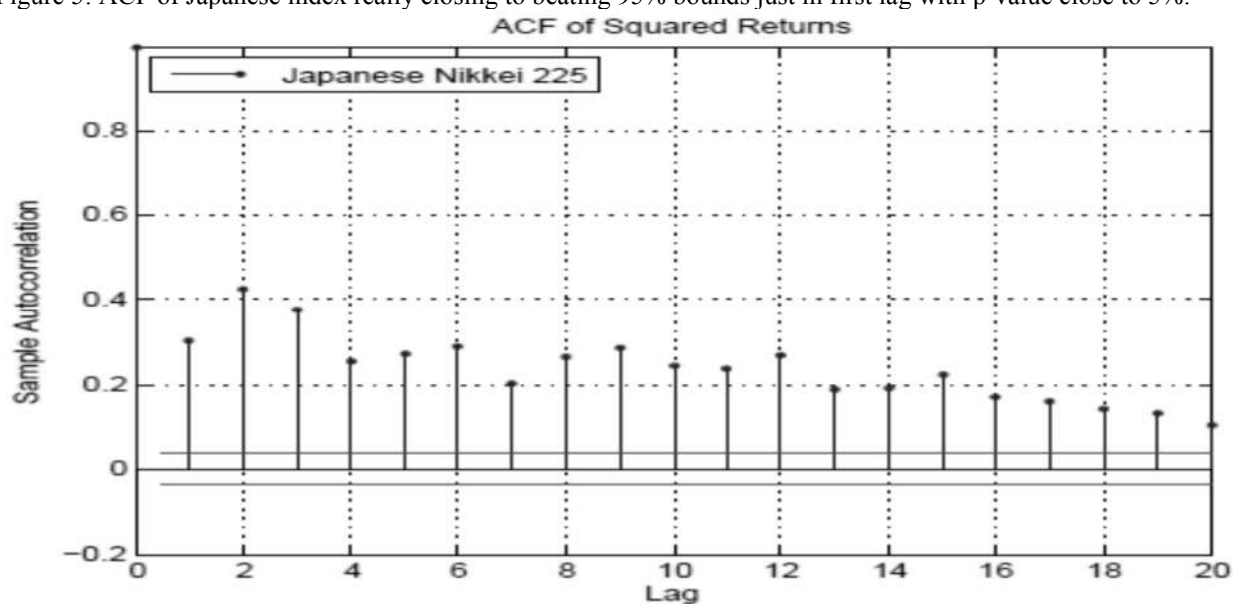


Figure 6: The sample ACF of the squared returns illustrates the high degree of persistence in variance until lag 12 and mild onward.

Table 4: Lagged daily returns regression of UK FTSE 100 index.

	<i>Coefficients</i>	<i>SE</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.000	0.000	0.765	0.444	0.000	0.000
Lagged return	0.048	0.018	2.560	0.010	0.085	0.011

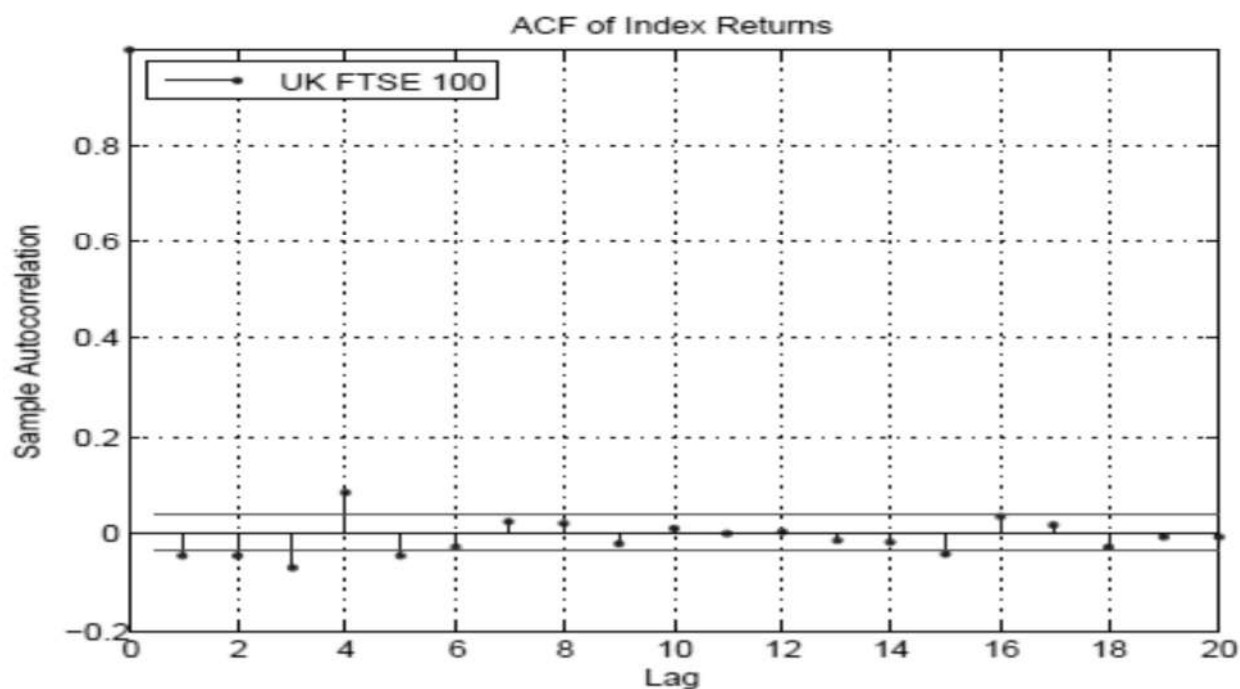


Figure 7: ACF of UK index exceeding 95% bounds just in first lag with a significant p-value equal to 1%.

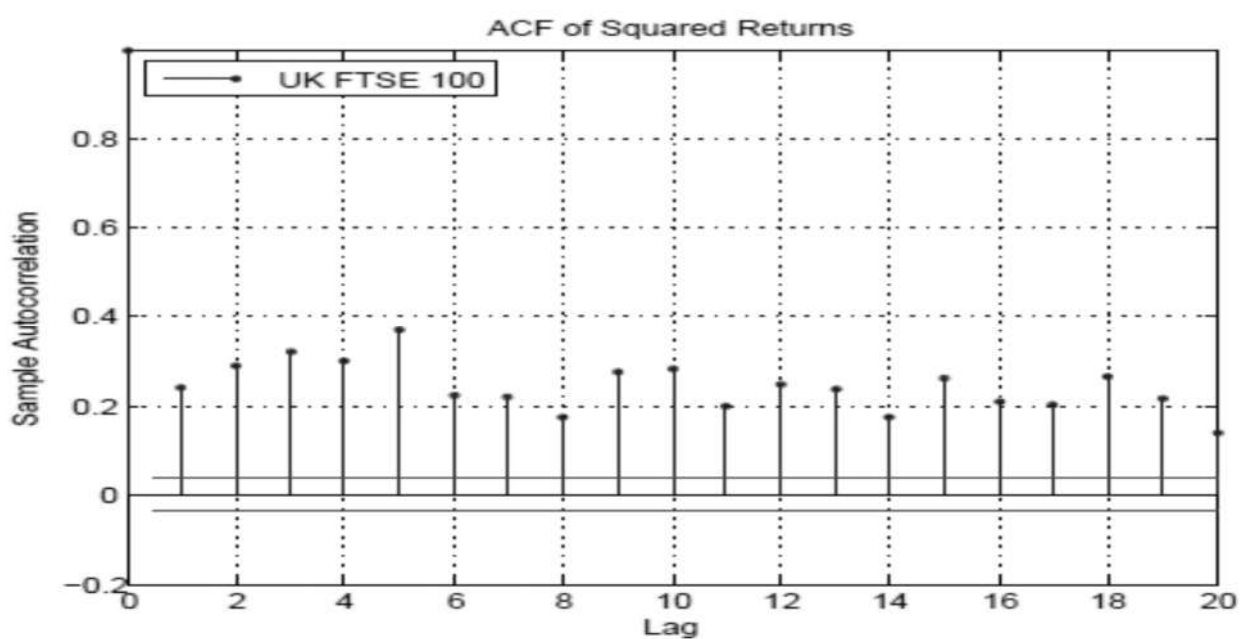


Figure 8: The sample ACF of the squared returns illustrates a high degree of persistence in variance.

Table 5: Lagged daily returns regression of US S&P 500 index.

	<i>Coefficients</i>	<i>SE</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.000	0.000	1.261	0.207	0.000	0.000
Lagged return	0.111	0.018	5.895	4.19E	0.148	0.074

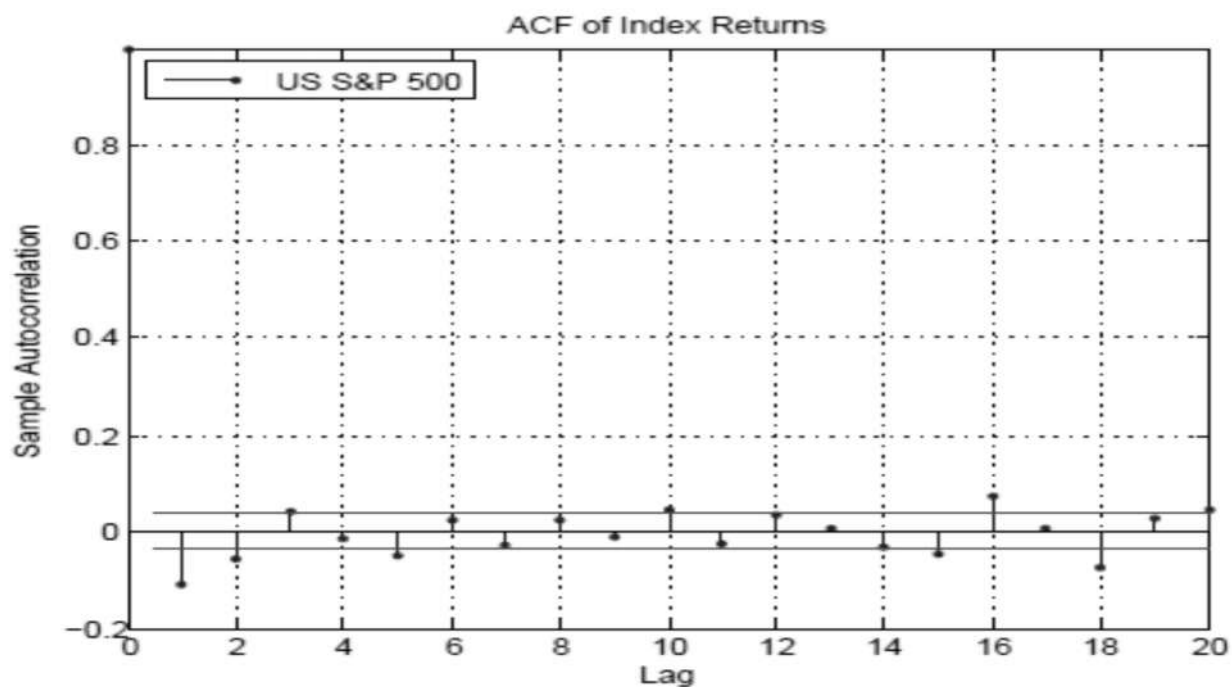


Figure 9: ACF of US S&P 500 Index. It reveals that just first lag crosses the 95% bounds.

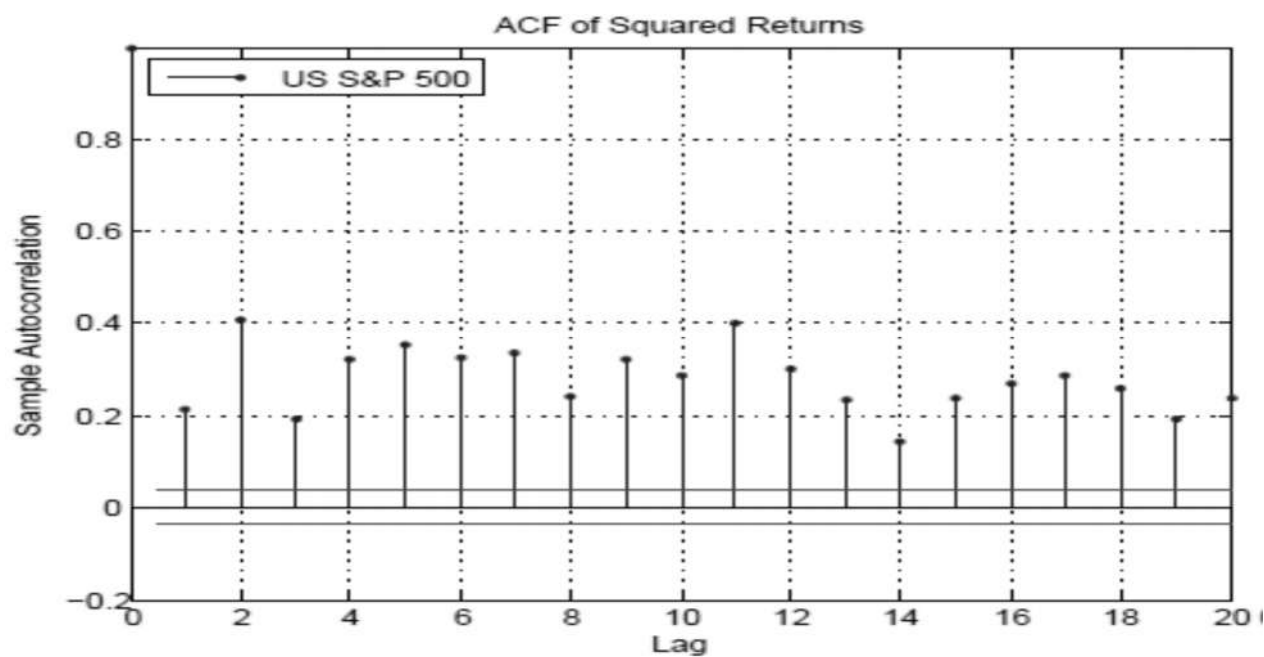


Figure 10: The sample ACF of the squared returns illustrates a high degree of persistence in variance.

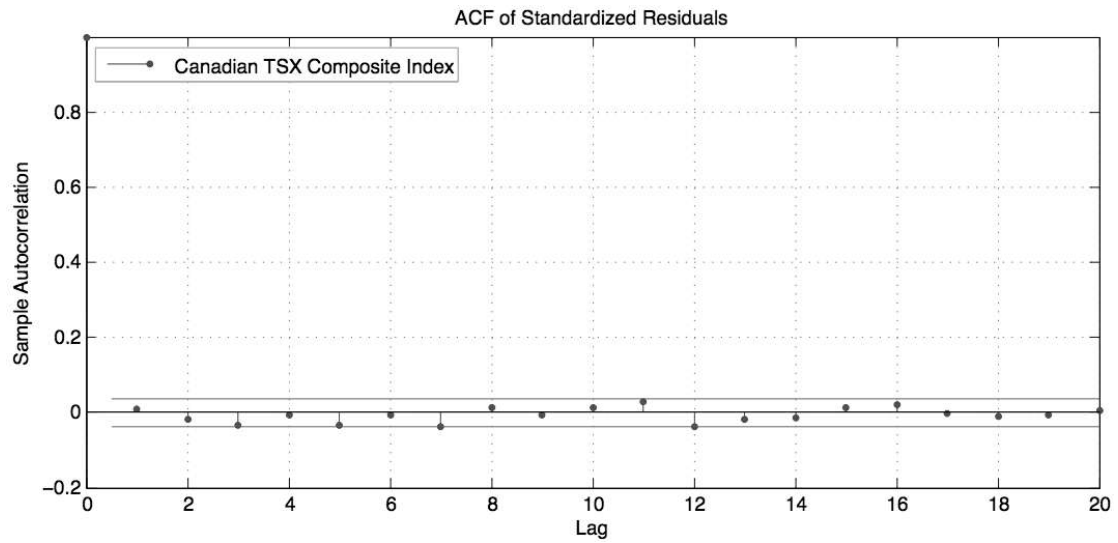


Figure 11: ACF of standardized residuals of Canadian TSX index. Source: Yahoo! Finance.

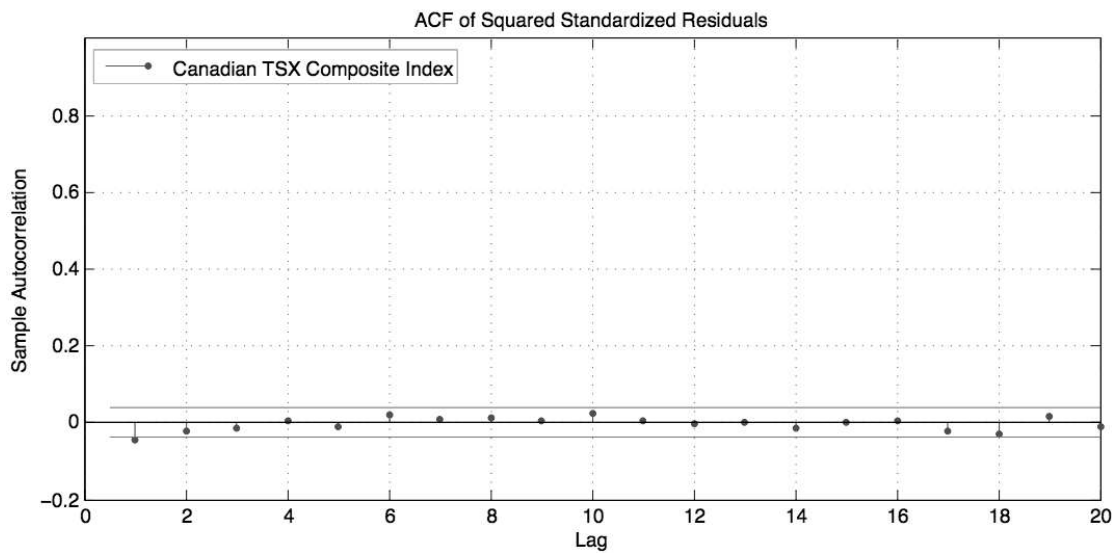


Figure 12: ACF of squared standardized innovations of Canadian TSX index. Source: Yahoo! Finance.

COMPARING THE PRECISION OF DIFFERENT METHODS OF ESTIMATING VAR WITH A FOCUS ON EVT

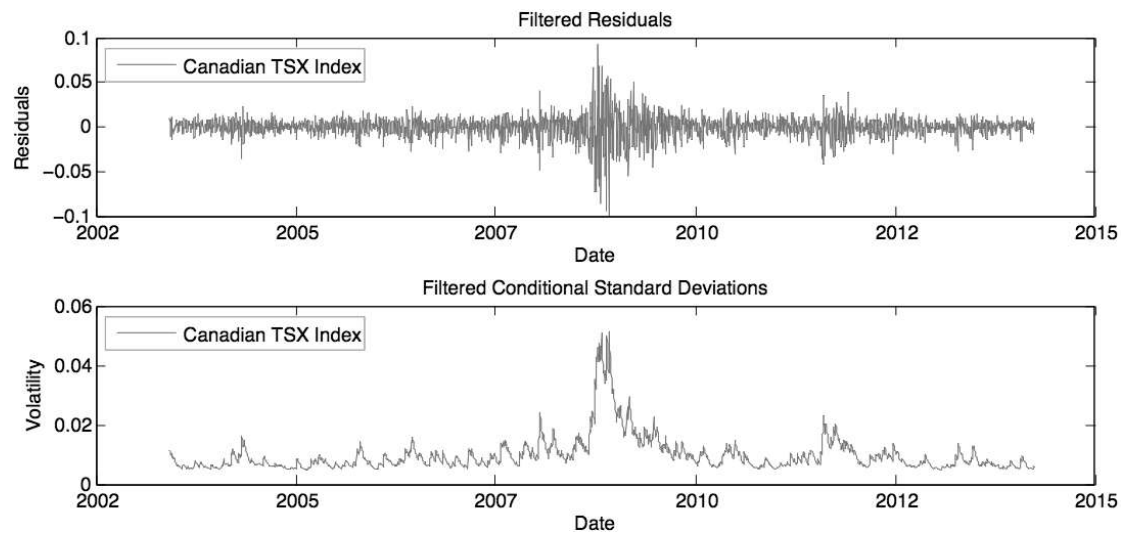


Figure 13: Plot of filtered innovations and filtered conditional standard deviations of Canadian TSX index. Source: Yahoo! Finance.

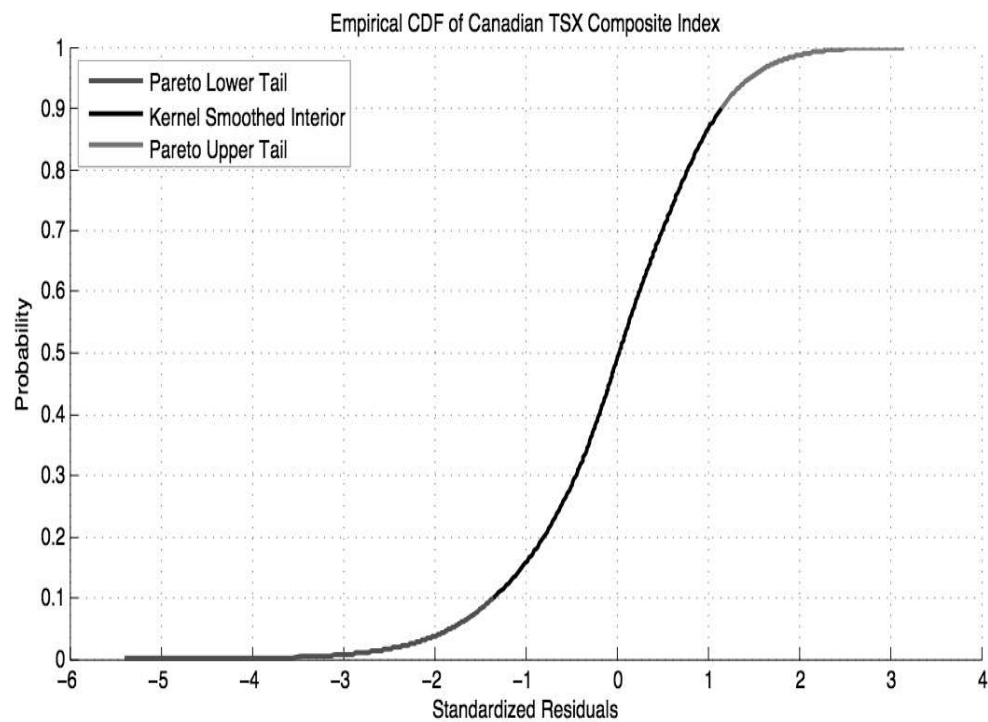


Figure 14: Empirical CDF of TSX index. Source: Yahoo! Finance.

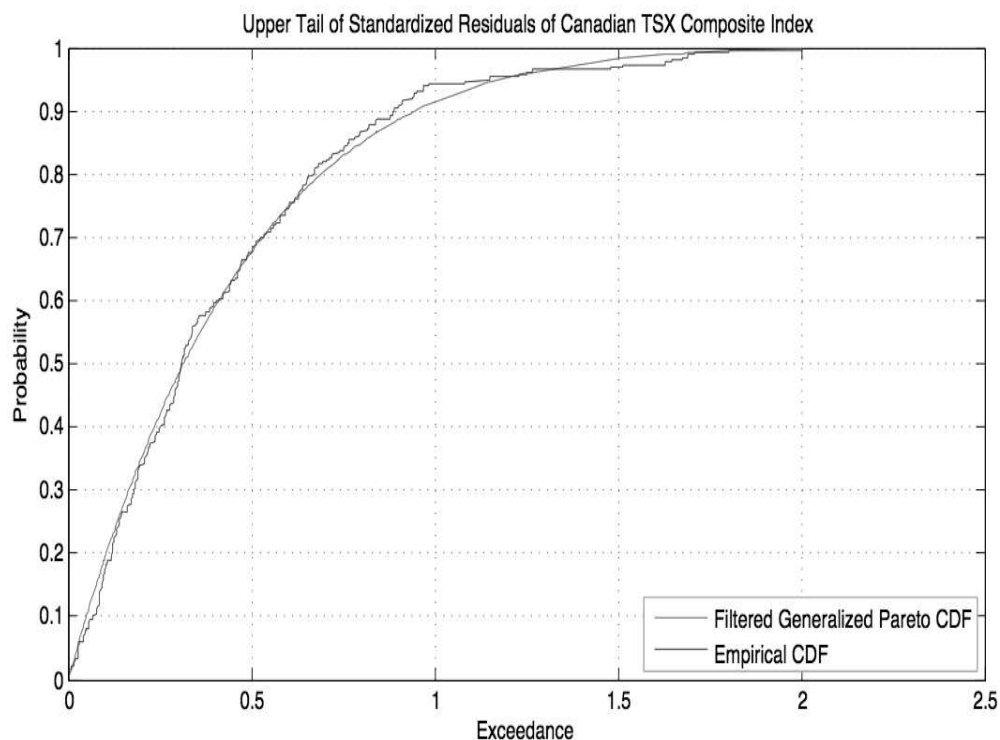


Figure 15: Filtered Generalized Pareto CDF v empirical CDF. Source: Yahoo! Finance.

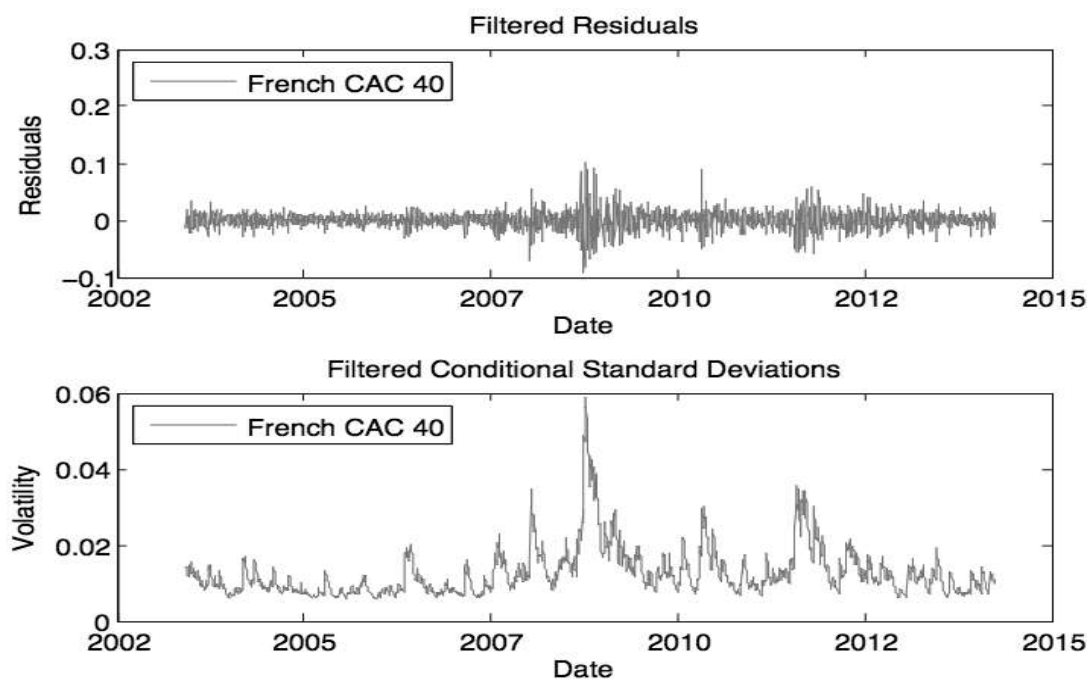


Figure 16: Filtered innovations and filtered conditional standard deviations of French CAC 40 index. Source: Yahoo! Finance.

COMPARING THE PRECISION OF DIFFERENT METHODS OF ESTIMATING VAR WITH A FOCUS ON EVT

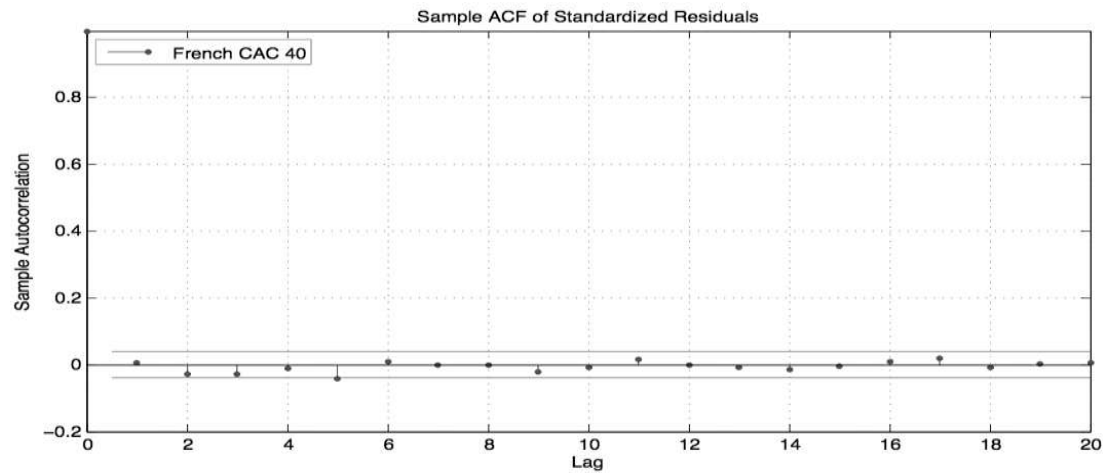


Figure 17: ACF of standardized innovations of French CAC 40 index. Source: Yahoo! Finance.

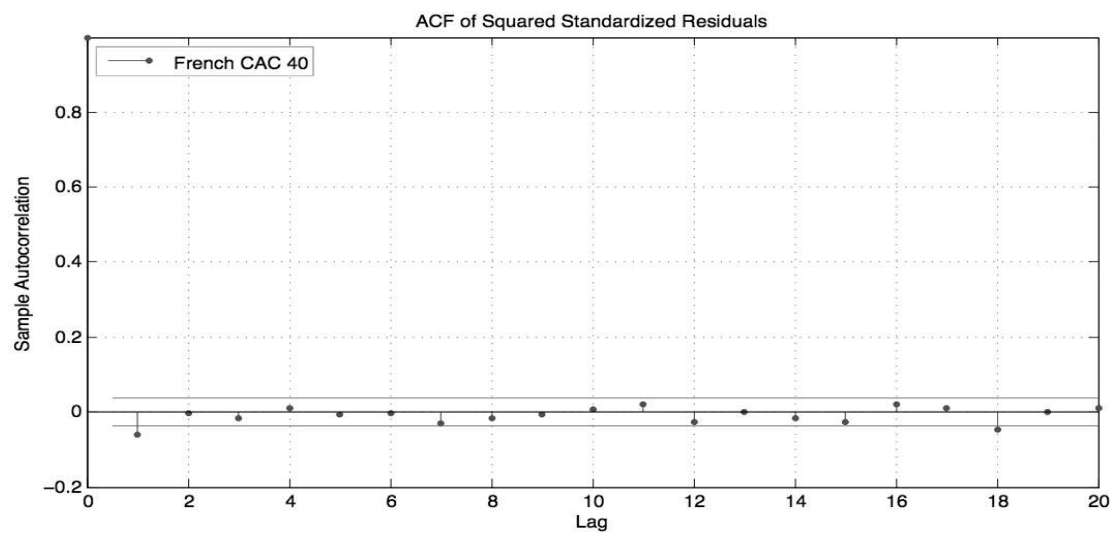


Figure 18: ACF of squared standardized residuals of French CAC 40 index. Source: Yahoo! Finance.

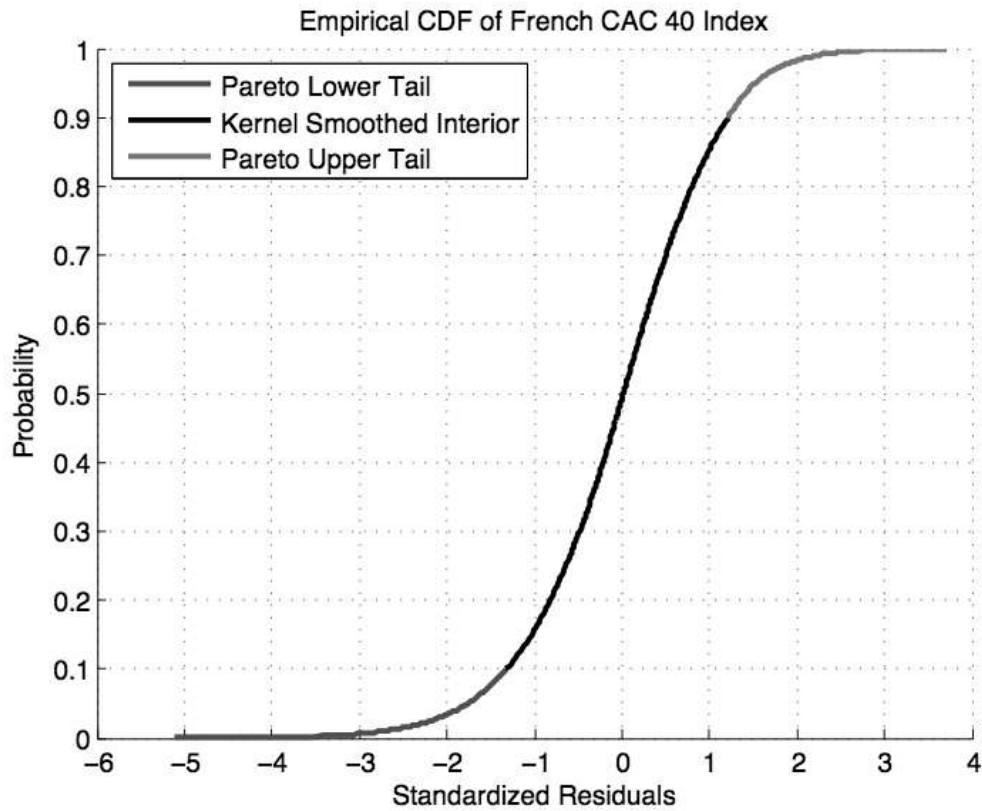


Figure 19: Empirical CDF of French CAC 40 index. Source: Yahoo! Finance.

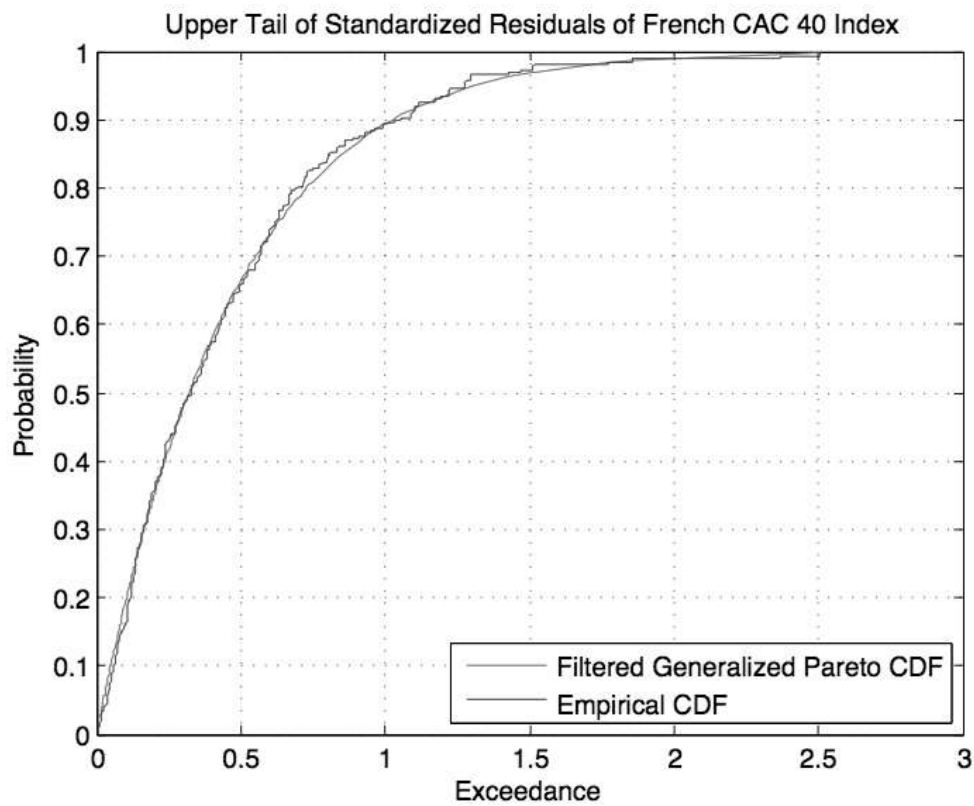


Figure 20: Filtered Generalized Pareto CDF vs empirical CDF of CAC index. Source: Yahoo! Finance.

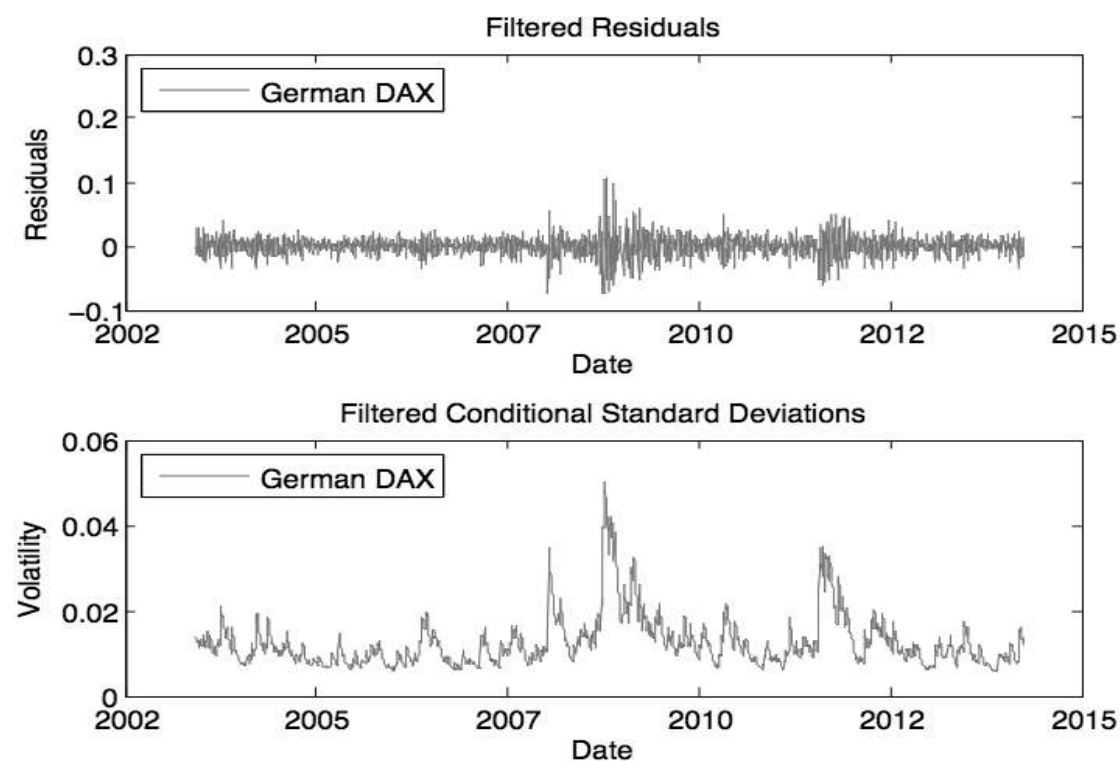


Figure 21: Plot of filtered innovations and filtered conditional standard deviation of German DAX index. Source: Yahoo! Finance.

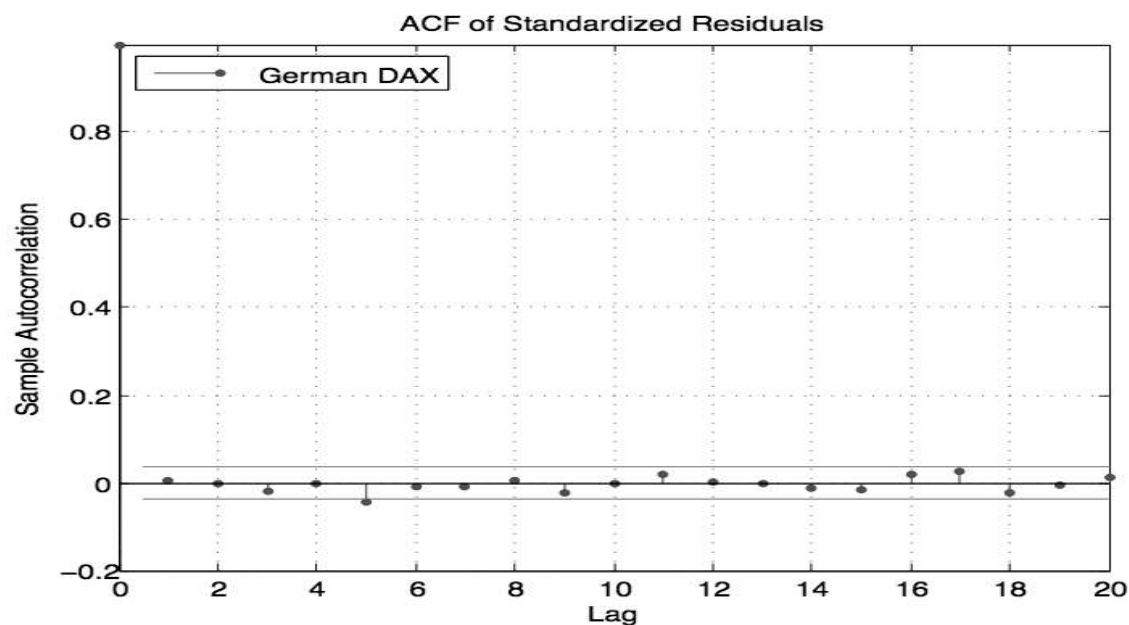


Figure 22: ACF of standardized innovation of German DAX index. Source: Yahoo! Finance.

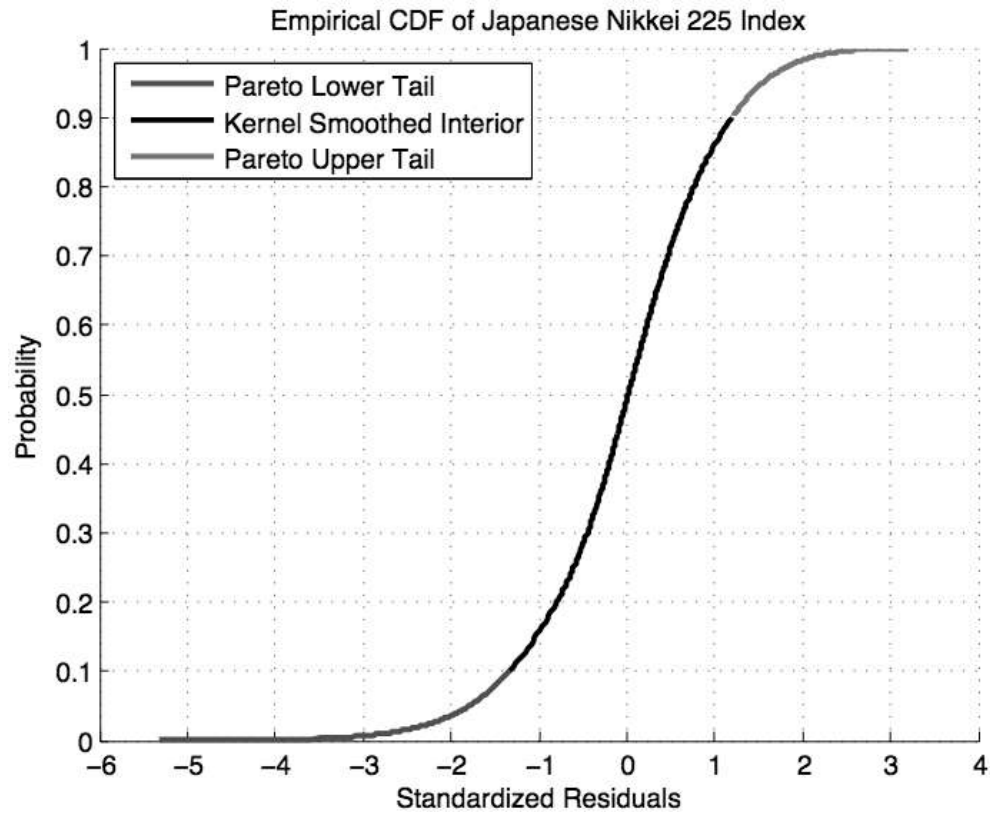


Figure 23: Empirical CDF of Nikkei index. Source: Yahoo! Finance.

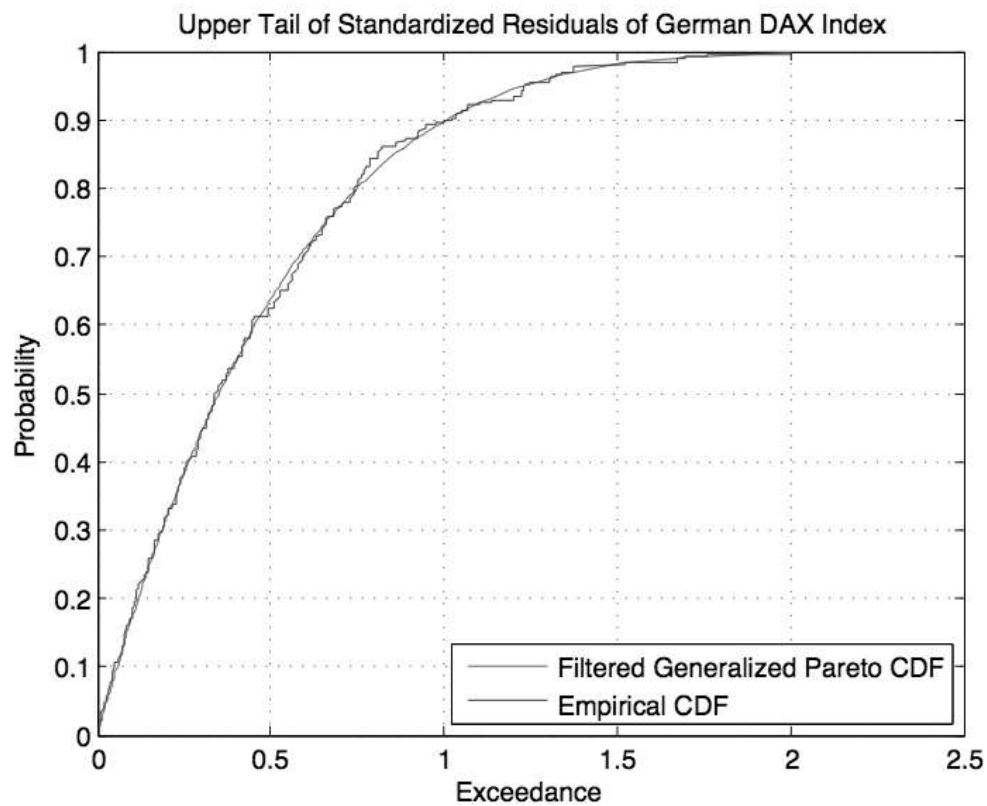


Figure 24: Filtered Generalized Pareto CDF vs empirical CDF of DAX index. Source: Yahoo! Finance.

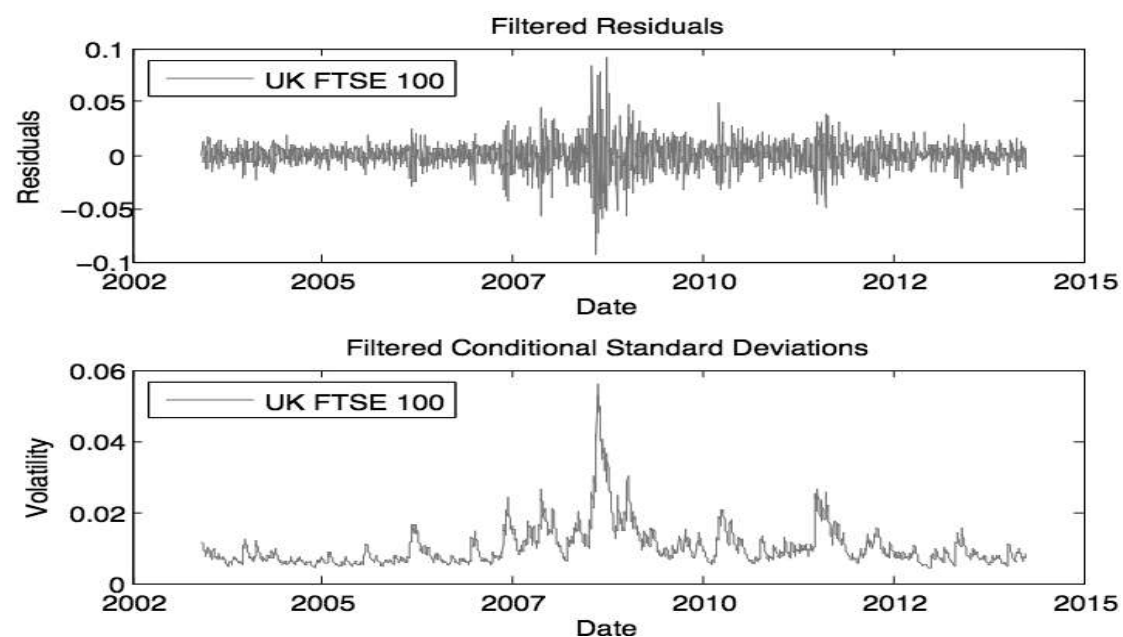


Figure 25: Plot of filtered innovations and filtered conditional standard deviation of UK FTSE 100 index. Source: Yahoo! Finance.

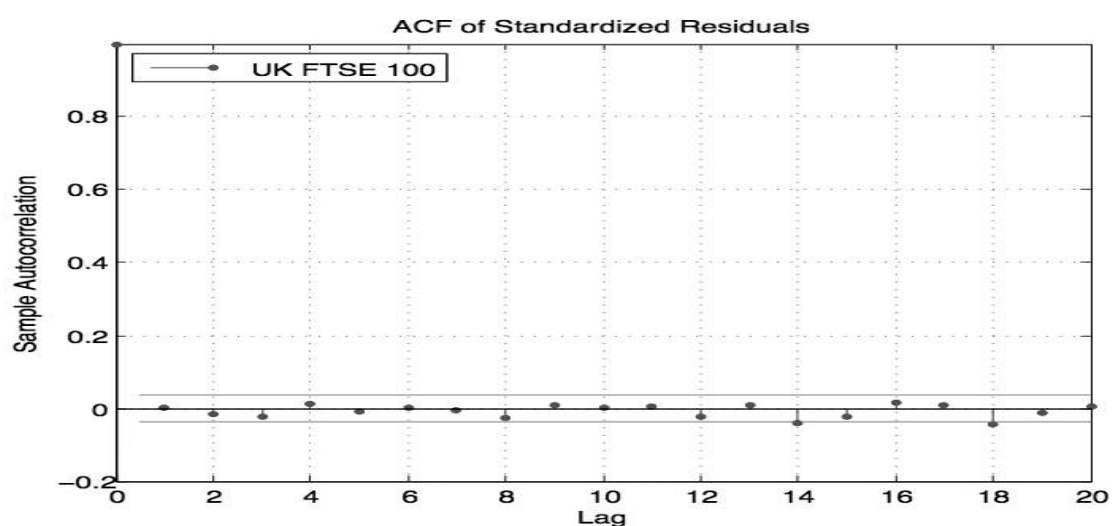


Figure 26: ACF of standardized innovations of UK FTSE 100 index. Source: Yahoo! Finance.

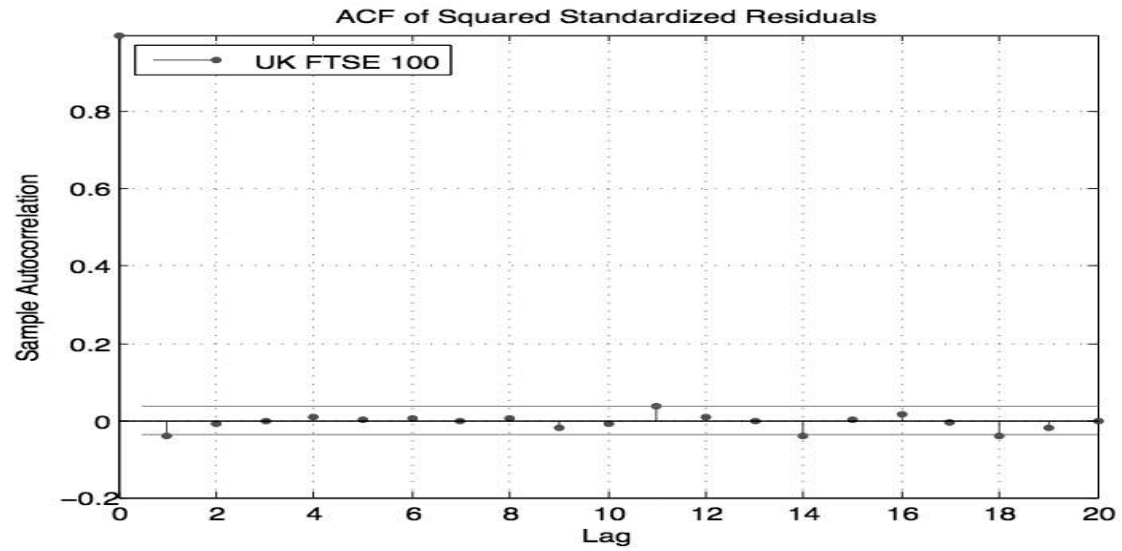


Figure 27: ACF of squared standardized innovations of UK FTSE 100 index. Source: Yahoo! Finance.

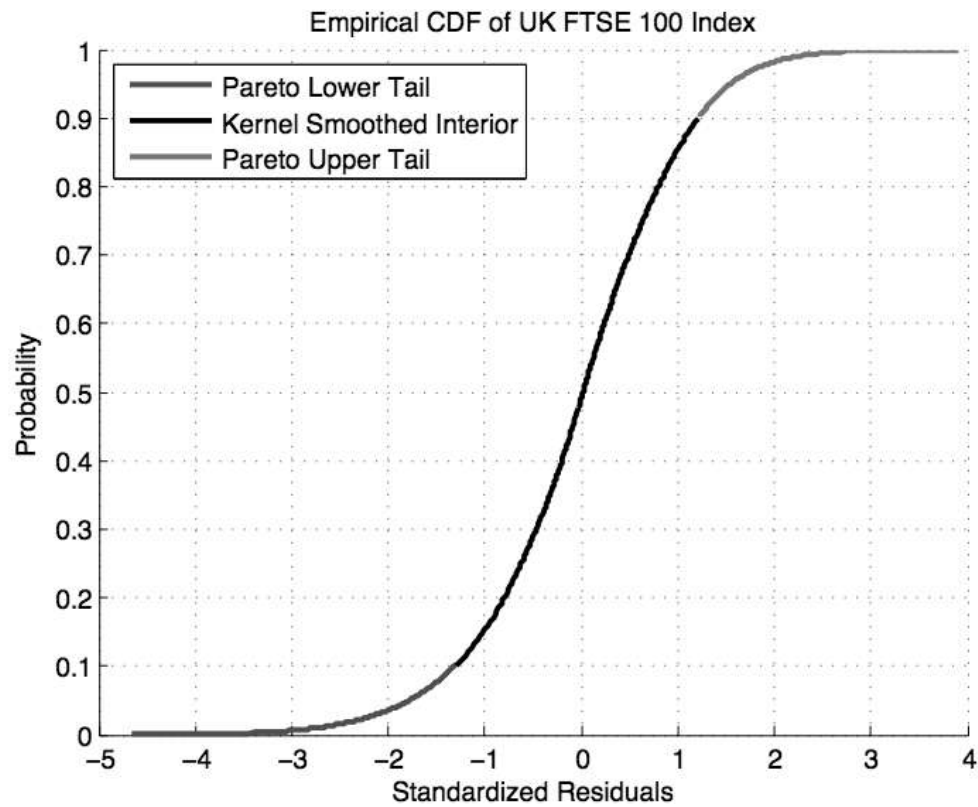


Figure 28: Empirical CDF of FTSE 100 index. Source: Yahoo! Finance.

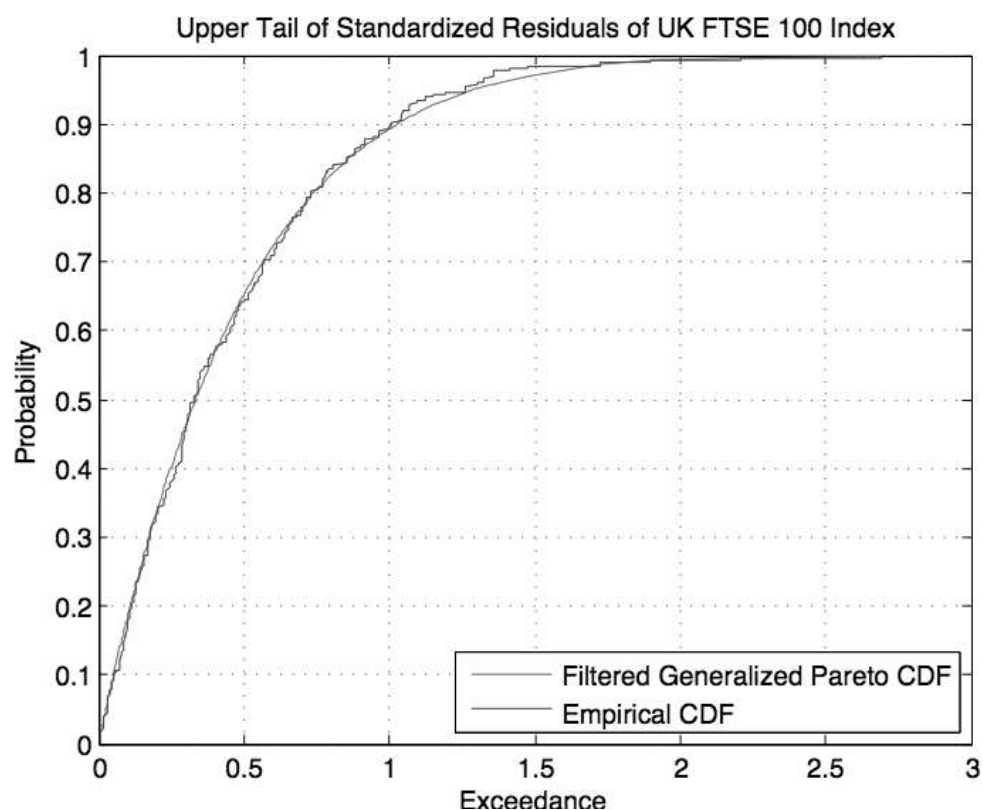


Figure 29: Filtered Generalized Pareto CDF vs. empirical CDF of FTSE 100 index. Source: Yahoo! Finance.

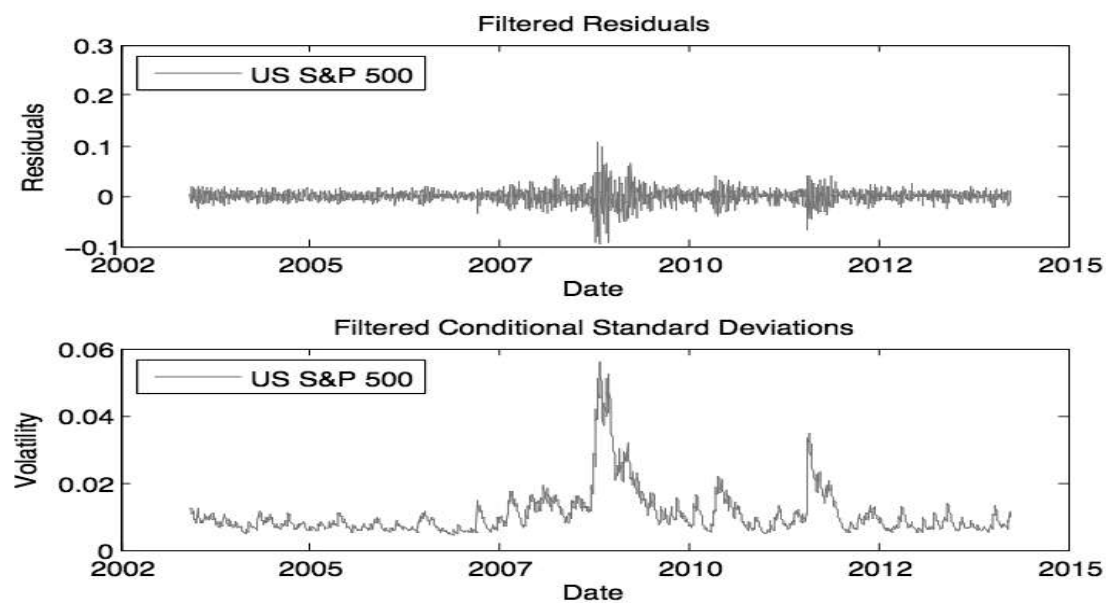


Figure 30: Plot of filtered residuals and filtered conditional standard deviations of US S&P 500 index. Source : Yahoo! Fiance.

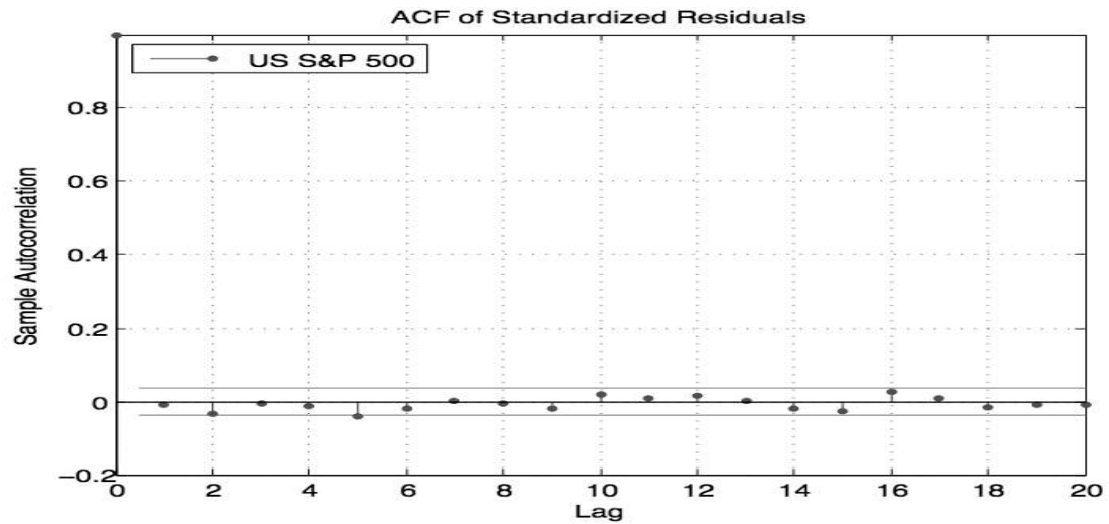


Figure 31: ACF of standardized innovations of US S&P 500 index. Source: Yahoo! Finance.

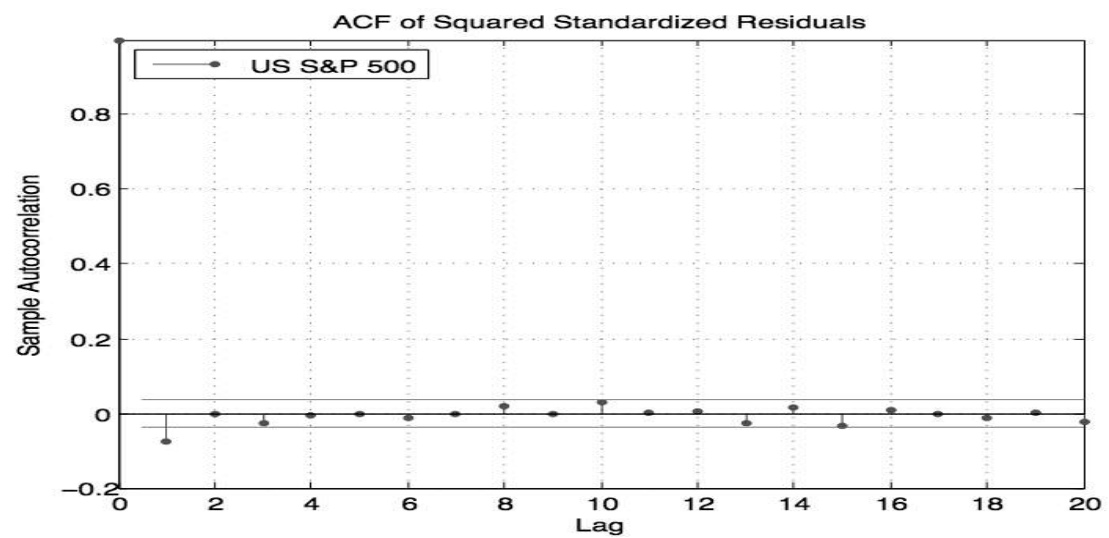


Figure 32: ACF of squared standardized innovations of US S&P 500 index. Source: Yahoo! Finance.

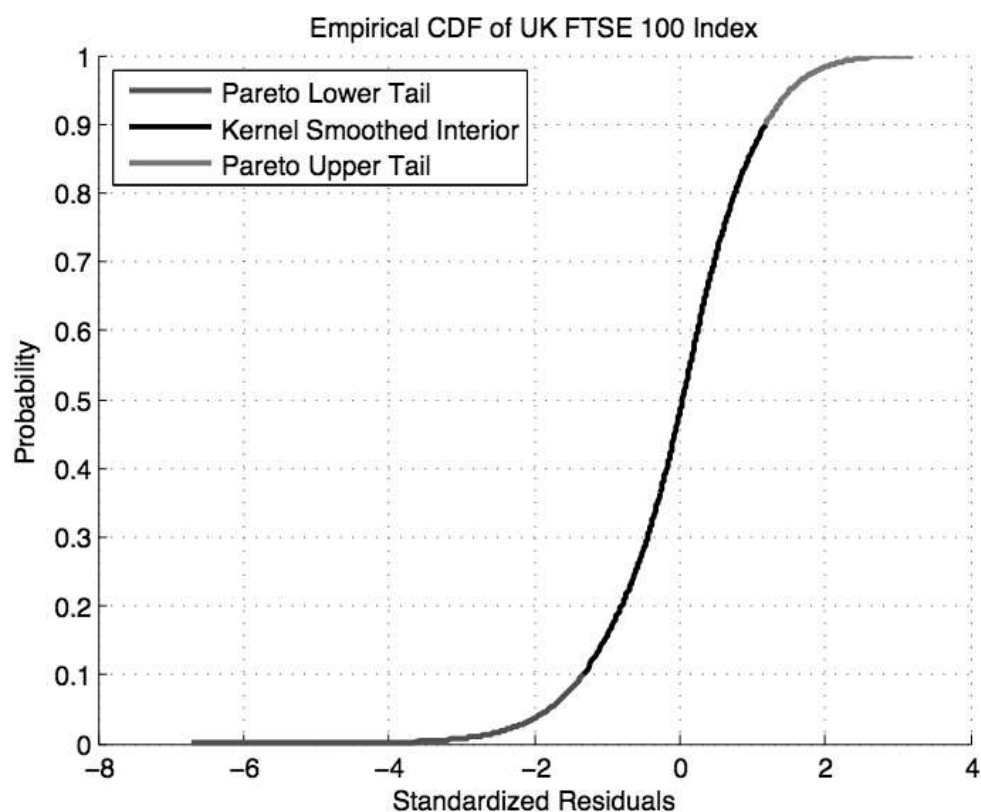


Figure 33: Empirical CDF of S&P 500 index. Source: Yahoo! Finance.

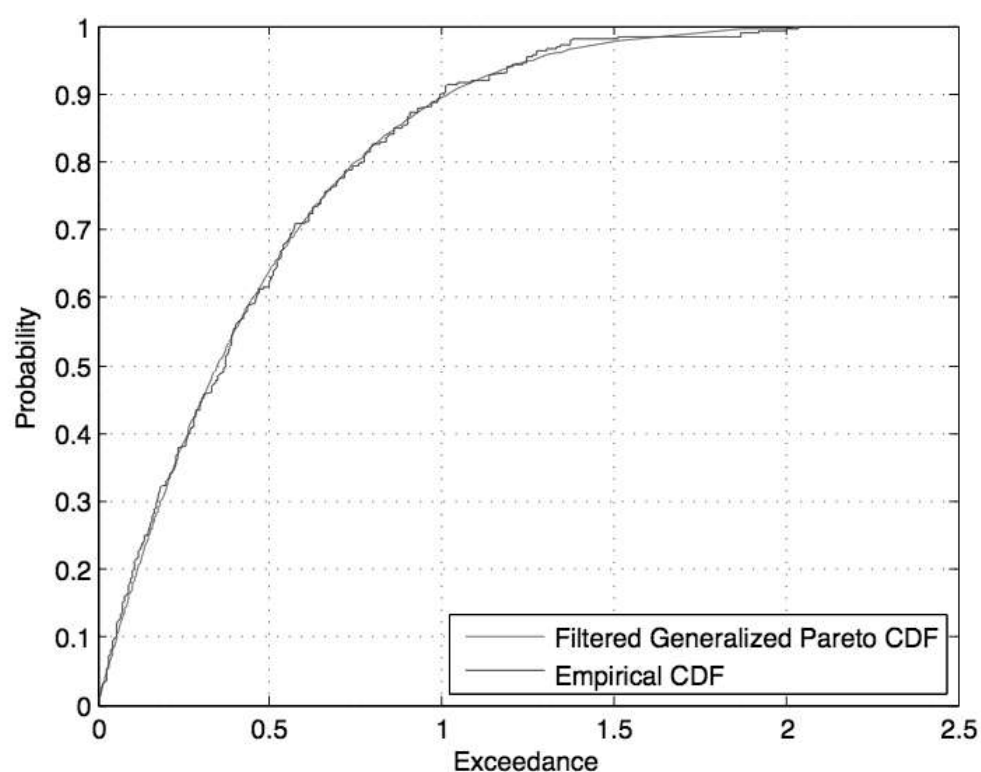


Figure 34: Filtered Generalized Pareto vs. empirical CDF of S&P 500 index. Source: Yahoo! Finance.

table 1

Advantage and disadvantages of VaR approaches.

	<i>Advantages</i>	<i>Disadvantages</i>
Parametric approach Makes a full parametric distributional and model form assumption. For example GARCH model with Gaussian errors	Its ease of implementation when a normal or Student-t distributions is assumed.	It ignores leptokurtosis and skewness when a normal distribution is assumed. Difficulties of implementation when a skewed distributions is assumed.
RiskMetrics a kind of parametric approach	Its ease of implementation can be calculated using a spreadsheet.	Its assumes normality of return ignoring fat tails, skewness, etc. this model lack non linear property which is a significant of the financial return.
Non Parametric approach (HS) Minimal assumption made about the error distribution, nor the exact form of the dynamic specifications	Not making strong assumptions about the distribution of the returns portfolio, they can accommodate wide tails, skewness and any other non-normal features. It is very easy to implement.	Its results are completely dependent on the data. It is sometimes slow to reflect major events. It only allows us to estimate VaR at discrete confidence intervals determined by the size of our data set. Its reliance on the stochastic process specified or historical data selected to generate estimations of the final value of the portfolio and hence of the VaR. It involves considerable computational expenses.
Semi-Parametric approach some assumptions are made, either about the error distribution, its extremes, or the model dynamics	Monte Carlo The large number of scenarios generated provide a more reliable and comprehensive measure of risk than analytical method. It captures convexity of non linear instruments and changes in volatility and time.	Difficulties of implementation.
	CaViaR It makes no specific distributional assumption on the return of the asset. It capture non linear characteristics of the financial returns.	
	FHS This approach retains the non parametric advantage and at the same time addresses some of HS's inherent problems, i.e. FHS take volatility background into account.	Its results slightly dependent on the data set.
	EVT Capture kurtosis and changes in volatility (conditional EVT).	
		It depends on the extreme return distribution assumption. Its results depend on the extreme data set.

Source: Author

INVESTORS' SENTIMENTS AND INDUSTRY RETURNS: WAVELET ANALYSIS THROUGH SQUARED COHERENCY APPROACH

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Abstract: *This study for the first time explores the time frequency relationship between investors' sentiments and industry specific returns. A sentiment index proxy is constructed using level and lag values of six indicators of investors' mood swing through Principle Component Analysis. The data on investors' sentiments and nine major industry's returns is used from 2001 to 2011. Wavelet Coherency analysis reveal that investors' sentiments and industry returns are significantly related and are in phase (cyclical). An optimistic view of the investors regarding an industry's performance results in higher returns and pessimistic view results otherwise. The relationship is significant on 0 ~ 8 and 32 ~ 64 months scale. Financial and energy crises play major role in the sentiment led industry's return. These findings are unique and were not possible through the traditional econometric estimates.*

Keywords: *Investors' sentiments, stock returns, wavelet analysis*

Introduction

Traditional financial theories postulate that the stock markets are efficient, the investors are rational in their behavior and they utilize complete (possible) information for decision making, so the capital asset prices are adequate and reflect their intrinsic values without being effected by investor sentiment. However, financial crises and resulting research on price anomalies, made market efficiency and its implications for asset pricing a debatable topic. Many researchers (Fama, 1991 among others) critiqued the unrealistic assumption underlying market efficiency, hence the idea of behavioral finance developed. Behavioral finance concludes that many of traditional finance assumption does not hold in reality e.g. traditional finance assumes that investors are risk averse whereas behavioral finance highlights that investors are loss averse. The investors' decision making is therefore impacted by their behavior at a certain point in time. Similarly, the idea of perfect rationality was replaced with bounded rationality (ability of investor to collect and evaluate all available market information) and hence the asset prices do not fully reflect the private and public information.

During last two decades, behavioral finance theorists contributed by clarifying the role of various emotional aspects of investors in their decision making process. According to Li et al (2008), many investors now believe on the investors sentimental approaches. Wang et al., (2009) concludes that sentiments as compared to economic variables are better indicator of final security prices. There

are two distinctions proxies i.e. explicit and implicit to measure the investor's reactions directly and indirectly, respectively. Implicit or indirect proxies (Finter and Ruenzi, 2010, Lahmiri, 2011, Glaser et al., 2009 and Lux, 2008) utilize trading patterns and/or market statistics to measure investors' sentiments.

There are three different types of financial markets investors. First, the rational traders, those utilize fundamental knowledge while making financial decisions. Second are the emotional investors, mainly driven by emotions and self-perceptions. Finally the "noise traders" who make random guess on the price movement (Kuzmina 2010). These noise traders without any specialized knowledge mainly rely on emotion while making investment decisions. They are present in all types (developed and emerging) of markets but their impact is more influential on developing markets. The investment decisions of noise traders disrupt the regularity of rational investors and distort the market equilibrium, and hence have impact on the stock market returns and vice versa (Glaser et al., 2009). These irregular investors get inferior returns and, in long run, thus are eventually driven out of the market (Schmitz et al., 2005).

Investor's sentiments result in different stock market anomalies e.g. the Ramadan effect (Bialkowski et al., 2012), calendar anomalies (Depenchuk et al., 2010), Saturday effect or so called Monday effect (Al Khazali et al., 2010). Media contents and its reputation is also known to have implications on the stock market returns (Tetlock, 2005). Different proxies e.g. investors' mood, closed end fund discount and trading volume have the impact on the investors' decision making process (Lahmiri, 2011). Baker and Wurgler (2006) identified proxies which affect the investors' sentiments. These indirect mood proxies include trading volumes, dividend premium, closed end mutual fund discount, initial public offerings (IPO) 1st day returns, IPO's volume, and total new equity issues. These investors' sentiments are used as a proxy measure of noise trader's behaviors. These sentiments may have both short- and long-term effects and result in higher returns volatility (Liu et al 2011). Yang and Wu (2010) examined the stock price and investors' sentiment relationship in Taiwanese stock market and concluded the presence of a sequential relationship. Bad performing stocks or having low current market prices are perceived to continue their low performance in the future (Liang and Ouyang 2010). And hence sentiments may also have the stock returns' forecasting power. Huiwen (2012) measured the impact of investors' sentiments on stock returns under different market regimes and concluded that irrational investment decisions result in deviations from fundamental values. The buy and sell imbalances i.e. investors buy (sell) securities in groups and two investors groups buy (sell) the same stocks were also examined by Kumar and Lee, (2006). Researchers (Lux, 2008; Finter et al., 2010; Michelfelder and Pandya, 2005) have concluded significant impact of sentiment on the developed market's return.

These proxies may not portray a complete picture when considered in isolation. Different stocks may have different sensitivity towards investor's sentiments (Finter et al, 2010). Glushkov (2005) concluded that stock's sensitivity may have been due to their sentimental beta. Investors' sentiments are able to explain the excessive returns of retail investors because it becomes the part of systematic risk (Lux, 2008). Mutual fund flows portray a negative market sentiment due to higher individual investments (Qiu and Welch, 2005). Chi et al., (2012) found a significant impact of higher mutual fund flows on the Chinese markets. The impact of sentiments on stock's returns is also determined by the number of large institutional investors, analysis skills and information systems (Michelfelder and Pandya, 2005). If the retail investors are in great number then there will be a greater sentiment's impact on the returns (Finter et al., 2010). Intuition investors and skilled analyst are less in number in emerging markets as compared to developed ones. And even in the developed market, less time is spent on investment analysis in comparison to the trading activities

(Kumar and Lee, 2006). However, impact of investors' sentiments is more profound in the emerging markets (Huerta and Liston, 2011). The higher volatility shocks also impact the investor's sentiments (Huiwen, 2012). Meijin and Jianjun (2004) concluded that sentiments may also correct the return fluctuations.

Historical literature indicates that investors' sentiments significantly impact the stock returns and this impact may last longer in developing stock markets. However, the emphases has been placed on measuring the influence of sentiments on overall stock returns and volatility and only a few have studied the industry differential impact (see e.g. Huang, 2012 and Huang et al. 2014). This study is the first effort, to the best of our knowledge, to investigate the investor's sentiments relationship with industry returns in Pakistan. Further, wavelet based time-frequency analysis approach has never been applied in the field of behavioral finance.

Data, Methodology and Discussion

Investor's Sentiment Index

There are two different methods to measures investors' sentiments i.e. direct and indirect approach. The measurement of investor's sentiments through direct approach e.g. survey and questionnaire, is subjective, time consuming and obtains limited feedback from the investors. The indirect approach measures the sentiment through proxies and form an index following Baker and Wurgler (2006) methodology. We have used following six indicators – number of Initial Public Offerings (IPO), average 1st day return on IPOs (RIPO) – (Finter et al; 2010), Karachi Stock Exchange (KSE-100) Index average daily turnover (TURN) – (Rehman, 2013), Equity/Debt ratio, closed end mutual fund discount (CEFD) – (Chi et al; 2012), and dividend premiums (DP) - (Baker et al, 2009)¹. The data on these variables has been obtained from the listed companies at Karachi Stock Exchange of Pakistan and spans from 2001 to 2011.

Table 1 indicates the descriptive statistics and correlation matrix of all six investors' sentiment indicators used in this study. All the indicators are high to moderate correlated with each other thus provide a strong basis to formulate Principle Component Analysis (PCA) for index construction.

¹ Details on the indicators can be found in the co-authors previous work i.e. Rehman (2013).

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Table 1: Descriptive statistics and pair-wise correlation of investor's sentiment indicators.

	IPO	RIOP	TURN	EDR	CEFD	DP
Mean	7.727	35.70	6.981	28.48	8.482	4.834
Std. Dev.	5.029	18.61	9.584	2.673	7.189	0.671
Skewness	1.106	-0.591	1.196	-0.908	1.202	-0.530
Kurtosis	2.935	2.213	3.330	2.310	3.598	1.897
JB Statistics	26.95***	11.08***	32.08***	20.78***	33.80***	12.87***
IPO	1					
RIOP	0.370**	1				
TURN	-0.030	0.374**	1			
EDR	0.520***	0.200*	-0.321**	1		
CEFD	0.306**	0.114	-0.408**	0.444**	1	
DP	0.192	0.551***	0.554***	-0.254*	-0.619***	1

Note: ***, ** & * indicate significance at 1%, 5% & 10% level, respectively. JB stands for Jarque Bera test.

First, we estimated the principle components by using all six variables with their lag terms. Thus, it provides a raw sentiment index of level and lagged variables. The cumulative influence of first four components to the raw sentiment index is 89.72%. The estimated raw sentiment index and estimated co-efficients for level and lagged sentiment indicators is as follow:

$$\begin{aligned}
 Sentiments_t^{Raw} &= -0.019 * IPO_t - 0.017 IPO_{t-1} + 0.008 * RIPO_t + 0.008 * RIPO_{t-1} + 0.036 \\
 &* TURN_t + 0.036 * TURN_{t-1} - 0.100 * EDR_t - 0.097 * EDR_{t-1} - 0.049 \\
 &* CEFD_t - 0.049 * CEFD_{t-1} + 0.587 * DP_t + 0.587 * DP_{t-1} \quad (1)
 \end{aligned}$$

Further, we calculated the correlation of raw sentiment index constructed as the first principle component through PCA with level and lagged values of all six indicators. Investor's sentiments are known to have a time differential impact on the stock returns and thus selection of appropriate order is essential. Table 2 provides the correlation values of level and lagged indicators. It indicates that IPO_t , $RIPO_{t-1}$, $TURN_t$, EDR_t , $CEFD_t$, and DP_{t-1} have the higher correlation with raw sentiment index. Therefore, these indicators have been used to construct the synthetic sentiment index.

Table 2: Correlation matrix of raw investor's sentiments index and indicators.

	IPO_t	$RIPO_t$	$TURN_t$	EDR_t	$CEFD_t$	DP_t
$Sentiments_t^{Raw}$	-0.206	0.326	0.764	-0.591	-0.787	0.844
	IPO_{t-1}	$RIPO_{t-1}$	$TURN_{t-1}$	EDR_{t-1}	$CEFD_{t-1}$	DP_{t-1}
$Sentiments_t^{Raw}$	-0.181	0.345	0.759	-0.582	-0.781	0.853

PCA is again applied on the selected five indicators (The cumulative contribution of first four components is 91.46%) with higher correlation values (see Table 2) and first principle component is used as the sentiment index in this study hereinafter. The estimated specification of the final sentiment index is as follow:

$$\begin{aligned}
 Sentiments_t = & -0.026 * IPO_t + 0.012 * RIPO_{t-1} + 0.052 * TURN_t - 0.139 * EDR_t \\
 & - 0.069 * CEFD_t + 0.819 * DP_{t-1} \quad (2)
 \end{aligned}$$

Figure 1 plots the investors' sentiment index from 2001 to 2011. The pessimistic sentiments are evident from the starting period of the study, a possible indication of post 2001 crises impact on the investor's behavior. Investor's behavior became optimistic after 2005 and remained so till 2011. These positive expectations may have resulted due to banking reforms, foreign portfolio flows and continuous upward trending market. A deep dip during 2007-08 indicates the impact of subprime mortgage crises in United States and hence this crises was perceived to have slump stock market performance. These behavioral reactions helps to conclude that the sentiment index is a reason approximation of the investor's sentiment.

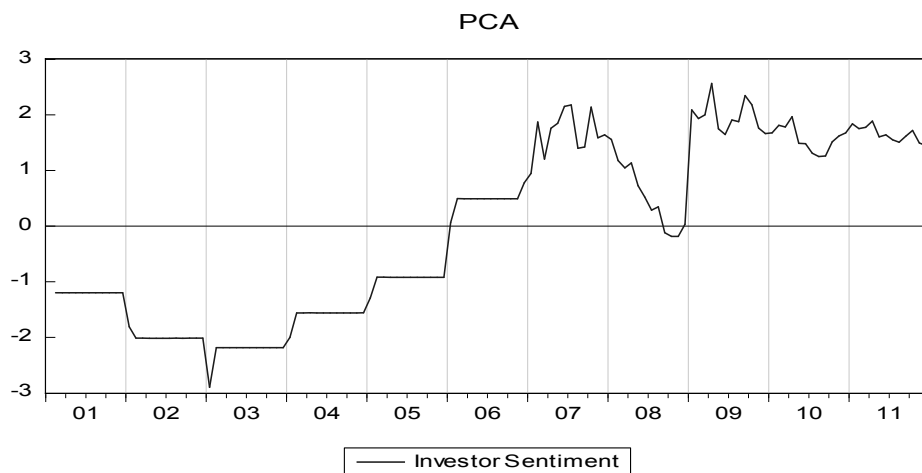


Figure 1: Investors' sentiment index over time

Industry-wise Returns

The monthly returns for nine major industries of KSE have been calculated by $r_{i,t} = \ln(p_{i,t}/p_{i,t-1})$, where $r_{i,t}$ and $p_{i,t}$ is return and closing price of industry i at time t . Descriptive statistics of all industries are shown in Table 3. Automobiles assembler and oil & gas exploration industries have the first (1.9%) and second (1.6%) highest monthly returns. The higher profitability of automobile industry may have been due to higher sales (lower prices) resulting from decrease in import duty. Oil & gas exploration witnessed high profitability due energy crises and resultant higher demand (prices) of energy products. Textile industry has the lowest (0.3%) average monthly return possibly due to higher raw material prices (floods and resulting lower crop yield). Standard deviation is highest (14.1%) for transport industry. Higher and unstable petroleum prices may have increased the volatility in this sector. Food & personal care industry, being the essential products with consistent demand, has the lowest risk (6.3%).

Table 3: Descriptive statistics of industries returns.

	Mean	Std. Dev.	Skewness	Kurtosis	JB Statistics
Automobile Assembler	0.019	0.089	0.133	3.619	2.494
Cement	0.015	0.115	0.638	5.996	58.35***
Engineering	0.009	0.093	-0.238	3.593	3.182
Food & Personal Care Products	0.020	0.063	0.041	3.986	5.390*
Oil & Gas Exploration	0.016	0.134	-1.918	12.20	547.2***
Power Generation & Distribution	0.004	0.104	0.649	7.584	124.8***
Textile Composite	0.003	0.094	0.148	3.779	3.819
Tobacco	0.020	0.106	0.289	4.451	13.42***
Transport	0.015	0.141	0.780	5.457	46.59***

Note: ***, ** & * indicate significance at 1%, 5% & 10% level, respectively. JB stands for Jarque Bera test.

Cross or Squared Wavelet Coherence (WTC) Approach

We have utilized wavelet methodology developed by Hudgins et al. (1993) and Torrence and Compo (1998) to study the relationship between investors' sentiments and industry returns. The Cross-Wavelet Coherency (WTC) and the Phase Difference (PD) is used to analyse the time-frequency dependencies between the time series. The WTC may be understood as the correlation coefficient in a time-frequency space. On the other hand, phase difference provides information regarding the delay or synchronization between the movements of two different time series" (Aguiar-Conraria et al. (2011), p. 2867). Further, Aguiar-Conraria et al. (2011, p. 2872) defined WTC as "the ratio of the cross-spectrum to the product of the spectrum of each series, and can be thought of as the local (both in time and frequency) correlation between two time-series".

So, similar to correlation, the wavelet coherency indicates higher similarity if it is equal to 1 otherwise there is no association between the variables in time-frequency scale. The series variance is shown by wavelet power spectrum. The large variation in wavelet power spectrum indicates higher power. And thus cross wavelet power spectrum indicates the higher covariance between the two variables over different time and/or frequencies. Following is the Torrence and Webster (1999) specification of the Wavelet Coherence for two variables:

$$R_n^2(S) = \frac{\left| S \left(s^{-1} W_n^{xy}(s) \right) \right|^2}{S(s^{-1} |W_n^x(s)|^2) \cdot S \left(s^{-1} |W_n^y(s)|^2 \right)} \quad (3)$$

Where, S indicates the smoothing operator. The above definition can be viewed as a traditional correlation coefficient which helps to explain the WTC as a localized correlation coefficient in a time-frequency space. The equation-1 can be re-written, if the smoothing function $S=1$ and its time-scale complication can be specified as follow:

$$S(W) = S_{Scale} \left(S_{Time} (W_n(s)) \right) \quad (4)$$

In Eq. 4 S_{Scale} and complication indicate smoothing along wavelet scale axis and time, respectively. Gaussian function and regular window is used for time and scale convolution, respectively (Torrence and Compo, 1998). The smoothing power according to Morlet wavelet can be articulated as under:

$$S_{time}(W) \Big|_s = \left(W_n(s) * c_1^{-t^2/2s^2} \right) \Big|_s \quad (5)$$

$$S_{scale}(W) \Big|_n = \left(W_n(s) * c_2 \Pi(0.6s) \right) \Big|_n \quad (6)$$

Where, c_1 and c_2 are the normalized constants and Π indicates the rectangular function. The co-evolutions and normalized coefficients are determined directly and indirectly, respectively. We have used Monte Carlo simulation to analyze the distribution of WTC. PD among the components is estimated through mean and confidence interval of time series. The mean phase with different angles ($a_i, i = 1, \dots, n$) is as follow:

$$a_m = \arg(X, Y) \text{ with } X = \sum_{i=1}^n \cos(a_i) \text{ and } Y = \sum_{i=1}^n \sin(a_i) \quad (7)$$

The independence of phase angles helps to calculate reliable confidence interval for mean angle. The scale resolution can be used to set the number of angles. Higher resolution means higher angles. The circular standard deviation may be specified as:

$$s = \sqrt{-2 \ln(R/n)}, \quad (8)$$

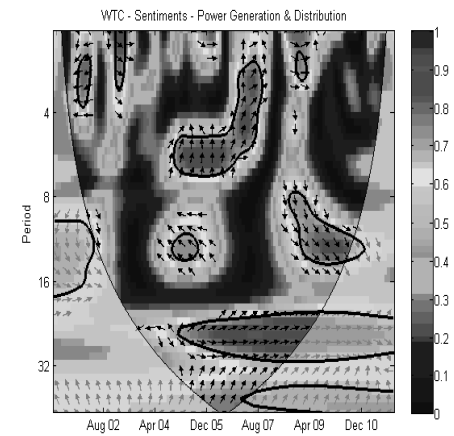
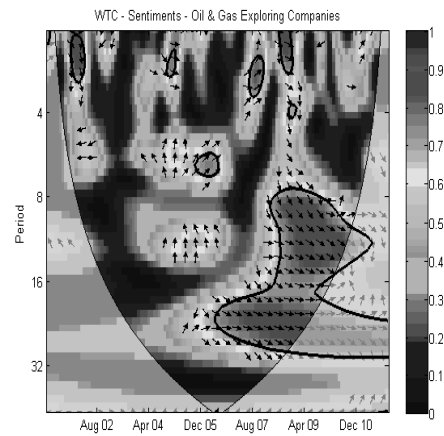
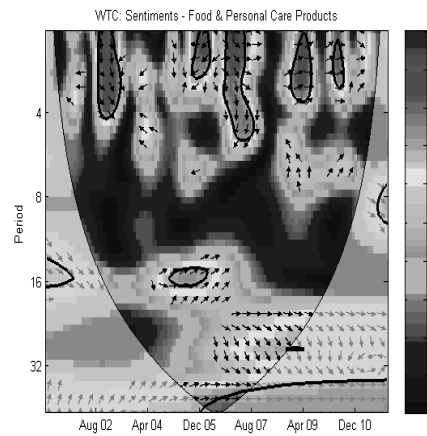
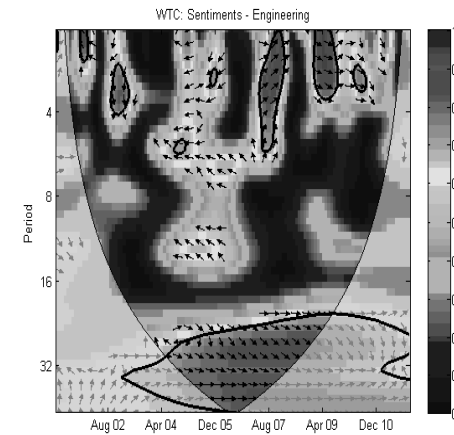
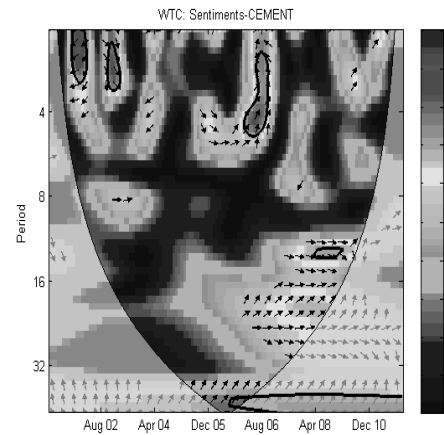
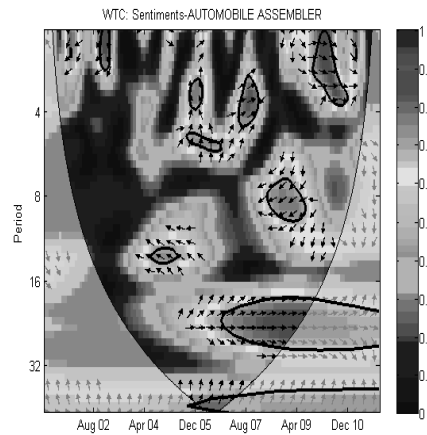
Where, $R = \sqrt{X^2 + Y^2}$. The circular standard deviation has the similar definition and meaning like a traditional standard deviation measure. We have used Monte Carlo simulation to identify the statistical level of significance. The lag length in phase can be written as:

$$\phi_{x,y} = \tan^{-1} \frac{I\{W_n^{xy}\}}{R\{W_n^{xy}\}}, \phi_{x,y} \in [-\pi, \pi] \quad (9)$$

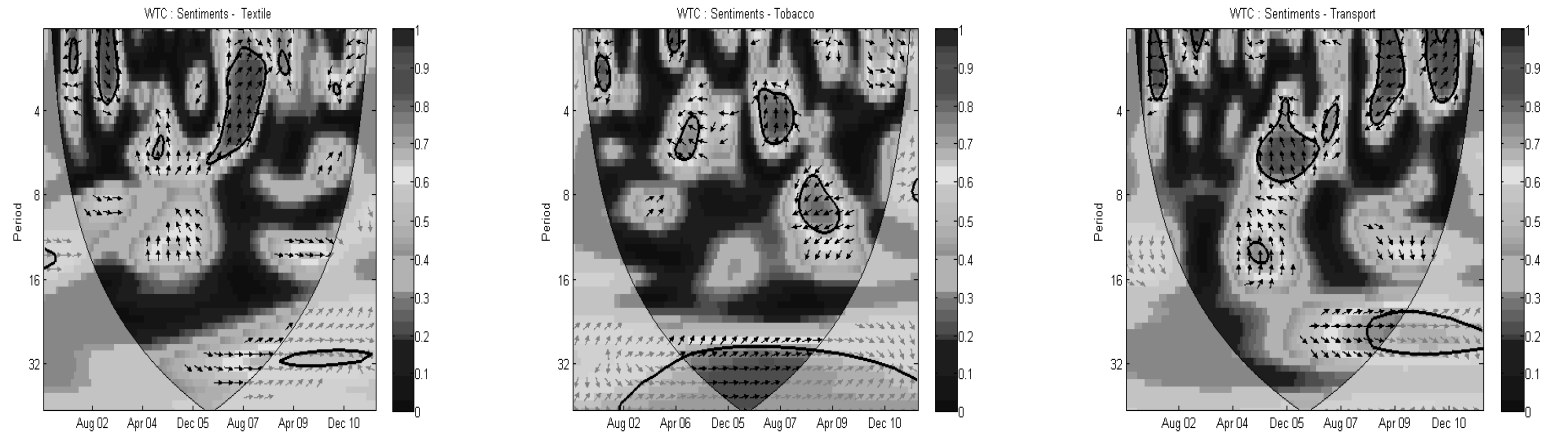
Where, I and R indicate the real and imaginary parts, respectively. This phase relation between the variables can be characterized using path difference. A zero value of phase difference indicates that both variables moves together with stated frequency. First series “x” lags second series “y” (sentiments and industry returns in this case), if $\phi_{x,y} \in [0, \pi/2]$. On the other hand “x” leads when $\phi_{x,y} \in [-\pi/2, 0]$. When there is a negative association between the two series (an anti-phase relationship) i.e. phase difference of π (or $-\pi$); meaning $\phi_{x,y} \in [-\pi/2, \pi] \cup [-\pi, \pi/2]$. If $\phi_{x,y} \in [\pi/2, \pi]$ then “x” leads, and “y” leads if $\phi_{x,y} \in [-\pi/2, -\pi]$.

Resulting figures of cross wavelet coherence between investor's sentiments and nine major industries are shown below. First evidence from the WTC analysis is that for all of the industries, investors' sentiments and returns are in phase. They have a cyclical nature i.e. both have a positive correlation. An optimistic view of the investors regarding an industry's performance results in higher returns and pessimistic view results otherwise. Similarly, up (down) industry performance also results in good (bad) investors' expectations. However, this specific direction, the lead (down arrow) and lag (up arrow) relationship can only be determined by examining the figure of each industry separately. For automobiles industry, on 0 ~ 8 months scale, investor's sentiments lead returns at 5% level of significance. An optimistic (pessimistic) view of investors leads to higher (lower) returns of automobile industry. There is also evidence of high association between investor's sentiments and automobile industry's returns during the financial crises 2007-08, however, the arrow are straight right indicating that during crises bad expectations and performance does not have a distinct lead-lag relation rather occur simultaneously. Similar results with low magnitude are evident for cement industry but there is no significant relationship during crises. We safely can conclude that investors' sentiments and cement industry returns have an insignificant relationship and thus sentiment or returns do not cause each other.

The sentiments had a cyclical lagging relationship with engineering industry's returns on 0 ~ 8 month scale and cyclical leading relationship over 32 ~ 64 months scale during the crises period. Food and personal care industry returns and investors' sentiments are also in phase and sentiments lead returns on 0 ~ 8 month scale. There is no significant relationship over longer time scale which also confirms our previous findings (lower risk) as the food products are necessities and do not change with the change in economic conditions. There is no significant relationship between Oil & Gas exploration industry returns and investors' sentiments on 0 ~ 8 month scale. But on 8 ~ 32 month scale, investors' sentiments lead returns, at 5% significance level, especially during the crises period (2007-8) and afterwards. Power generation industry and sentiments also have a similar relation over varying scales. These findings suggest that financial crises coupled with energy crises are the conditions that increase the impact of investors' sentiments on returns and vice versa. Thus, the investors' sentiment and industry return relationship is not persistent in nature and depends on the overall economic conditions. For textile industry, sentiments lag returns on 2 ~ 6 and there is no impact of financial crises. Tobacco and transport industries returns indicates mixed result with sentiments even few counter-cyclical relation where sentiments lag returns. However, tobacco industry shows a significant impact of sentiments on returns on 32 ~ 64 month scale.



Cross-wavelet (squared wavelet) coherency between investors' sentiments and industry returns.



Note: The dense black outline indicates the 5% significance level against the red noise. The lighter shade cone shows the edge effect also named as cone of influence (COI). Color code is indicated to the right of each picture where blue indicates the low power and red shows high power. Y-axis measures the frequencies or scale and X-axis represent the time in weeks. Arrows indicate the phase difference between the two series. Interpretation of the direction is a follow:

(→) = variables are in phase (cyclical effect on each other); (↗) = Investors' sentiments are lagging; (↘) = Investors' sentiments are leading; (←) = variables are out of phase (anti-cyclical effect); (↖) = Investors' sentiments are leading; (↙) Investors' sentiments are lagging.

Cross-wavelet (squared wavelet) coherency between investors' sentiments and industry returns

Conclusion

Emergence of behavioral finance identified irrationality in the investors' behavior and its implications for the market efficiency. Investors' sentiments or mood swings have been studied and found to have relationship with stock market returns and volatility. However, little focus has been given to the impact of sentiments on industry returns. This study for the first time explores the time frequency relationship between investors' sentiments and industry specific returns. A sentiment index proxy is constructed using level and lag values of six indicators of investors' mood swing through Principle Component Analysis. The data on investors' sentiments and nine major industry's returns is used from 2001 to 2011.

Wavelet Coherency analysis reveal that investors' sentiments and industry returns are significantly related and are in phase (cyclical) for all nine industries. An optimistic view of the investors regarding an industry's performance results in higher returns and pessimistic view results otherwise. Similarly, up (down) industry performance also results in good (bad) investors' expectations. The relationship is significant at 5% level of significance and on 0 ~ 8 and 32 ~ 64 months scale. Financial and energy crises play major role in the sentiment led industry's return. Import oriented industries i.e. Automobile assemblers, engineering and tobacco industry's returns evident increased impact of sentiments during financial crises of 2007-08. Energy oriented segment i.e. Oil & gas exploration and power generation industry returns are also seems to have enhanced sentiment impact due to energy prevailing crises. These findings are unique and were not possible through the traditional econometric estimates. Our findings of high cyclical association between investors' sentiments and industry returns during crises open up possibility of two new dimensions. First, overall economic, political and social conditions may have simultaneously impacted both investors' sentiments and returns or second, macro-economic conditions first change investors' behavior and resulting investors' sentiments impact stock market returns. We leave this interesting debate for future research.

References

- Aguiar-Conraria, L., & Soares, M. J. (2011). Oil and the macroeconomy: using wavelets to analyze old issues. *Empirical Economics*, 40(3), 645-655.
- Al-Khazali, O.A. and Zoubi, T. (2010). The Saturday effect in emerging stock markets: a stochastic dominance approach. *International Journal of Emerging Markets*, 5(2), 227-246.
- Baker, M. and Wurgler, J. (2007). Investor Sentiment in the Stock Markets. *Journal of Economic Perspectives*, 21(2), 129-151.
- Białkowska, J., Etebarib, A. and Wisniewskic, T.P. (2012). Fast profits: Investor sentiment and stock returns during Ramadan. *Journal of Banking & Finance*, 36(3), 835-845.
- Chi, L., Zhuang, X., & Song, D. (2012). Investor sentiment in the Chinese stock market: an empirical analysis. *Applied Economics Letters*, 19(4), 345-348.
- Depenchuk, I.O., Compton, W.S. and Kunkel, R.A. (2010). Ukrainian financial Markets: an examination of calendar anomalies. *Managerial Finance*, 36(6), 502-510.
- Fama, E. F. (1991). Efficient capital markets: II. *The journal of finance*, 46(5), 1575-1617.
- Finter, P., Ruenzi, A.N. and Ruenzi, S. (2012). The Impact of Investor Sentiment on the German stock Markets. *Journal of Business Economics*, 82(2), 133-163.
- Glaser, M., Schmitz, P., & Weber, M. (2009). Individual Investor Sentiment and Stock Returns- What Do We Learn from Warrant Traders?. Available at SSRN 923526.
- Glushkov, D. (2005). Sentiment beta. University of Texas at Austin. Working Paper Series,

INVESTORS' SENTIMENTS AND INDUSTRY RETURNS: WAVELET ANALYSIS THROUGH SQUARED COHERENCY APPROACH

- [Online] Available: papers.ssrn.com/sol3/papers.cfm?abstract_id=862444
- Huang X. (2012). Investor sentiment on the expected return and volatility: the influence of difference of empirical research based on the industry.
- Huang, C., Yang, X., Yang, X., & Sheng, H. (2014). An Empirical Study of the Effect of Investor Sentiment on Returns of Different Industries. *Mathematical Problems in Engineering*, 2014.
- Hudgins, L., Friehe, C. A., & Mayer, M. E. (1993). Wavelet transforms and atmospheric turbulence. *Physical Review Letters*, 71(20), 3279.
- Huerta, D. and Liston, D. P. (2011). The role of investor sentiment on Mexican stock market returns and volatility. Discussion Paper. South Finance Association.
- Huiwen, Z., and Sun, L. (2012). The Influence of Investor Sentiment on Stock Return and its Volatility under Different Market States. *Business Intelligence and Financial Engineering (BIFE)*, Fifth International Conference.
- Kumar, A. and Lee, C.M. (2006). Retail Investor Sentiment and Return Co-movements. *The Journal of Finance*, 61(5), 2451-2486.
- Kuzmina, J. (2010). Emotion's component of expectations in financial decision making. *Baltic Journal of Management*, 5(3), 295-306.
- Lahmiri, S. (2011). Neural networks and investor sentiment measures for stock market. *Trend Prediction*, 27(1), 1-10.
- Li, C. A., Hsu, A. C. and Ley, H. J. (2008). Market Crashes and Investor Sentiment: the Case of Taiwan. *Journal of International Management Studies*, 3(1), 275-283.
- Liu, H. H., Wu, C. C. and Su, Y. K. (2011). The role of extreme investor sentiment on stock and futures market returns and volatilities in Taiwan. *British Journal of Politics and International Relations*, 11(1), 504-551.
- Lux, T. (2010). Sentiment Dynamics and Stock Returns: the Case of the German Stock Market, *Empirical Economics*, 41(3), 663-679.
- Market: evidence from the Taiwan futures Exchange. *International Research Journal of Finance and Economics*, 29(6), 134-151.
- Meijin, W., & Jianjun, S. (2004). Stock Market Returns, Volatility and the Role of Investor Sentiment in China. *Economic Research Journal*, 10, 008.
- Michelfelder, R. A. and Pandya, S. (2005). Volatility of Stock Returns: emerging and Mature Markets. *Managerial Finance*, 31(2), 66-86.
- Qiu, L. and Welch, I. (2005). Investor Sentiment Measures, Working Paper No. 10794. National Bureau of Economic Research.
- Schmitz, P., Glaser, M., & Weber, M. (2007). Individual investor sentiment and stock returns: what do we learn from warrant traders?. *Lehrstuhl für Allgemeine Betriebswirtschaftslehre, Finanzwirtschaft, insbesondere Bankbetriebslehre, Universität Mannheim*.
- Tetlock, P.C. (2005). Giving Content to Investor Sentiment: the Role of Media in the Stock market. *Journal of Finance*, 62(3), 1139-1168.
- Torrence, C., & Compo, G. P. (1998). A practical guide to wavelet analysis. *Bulletin of the American Meteorological society*, 79(1), 61-78.
- Torrence, C., & Webster, P. J. (1999). Interdecadal changes in the ENSO-monsoon system. *Journal of Climate*, 12(8), 2679-2690.
- Ur Rehman, M. (2013). Investor's Sentiments and Stock Market Volatility: an empirical evidence from emerging stock market. *Pakistan Journal of Commerce & Social Sciences*, 7(1).
- Rehman, M., 2013. Investor Sentiments and Exchange Rate Volatility. *Business Review*, 8 (1), p. 123-34.
- Wang, Y. M., Li, C. A. and Lin, C. F. (2009). The Impact of Investor Sentiment on the Futures
- Yang, A.S. and Wu, M.L. (2011). Exploring the relationship between investor sentiment and price volatility. *Quantitative Finance*, 11(6), 955-65.

THE IMPACT OF CORPORATE GOVERNANCE AND EARNINGS MANAGEMENT PRACTICES ON COST OF EQUITY CAPITAL: EVIDENCE FROM THAI LISTED COMPANIES

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Abstract. *The significant impact of recent, and often high-profile, corporate accounting scandals, is often attributed to earnings management and factors surrounding cost of equity capital. Understanding the relationship between these factors is important for both the management of corporations and for the confidence of their investors. The main objective of this paper is to examine the influence of earnings management and corporate governance on the cost of equity capital in listed companies in Thailand and determine their impact, which could be used to initiate strategies to restore investor confidence. Earnings management in this paper is measured from the absolute value of discretionary accruals that are calculated from five different models. Corporate governance variables in this paper include board interlocking, board independence, board size, CEO-Chair duality, audit committee financial expertise, audit opinion, managerial ownership and institutional shareholders. The CAPM and Industry Adjusted Earnings to Price ratio model are used as a proxy for the cost of equity capital in this paper. To test the influence of these factors, a fixed-effect panel data regression model is applied. The results reveal that companies with higher earnings management, higher proportion of managerial ownership, institutional ownership, CEO-Chair duality and which receive modified audit opinions are likely to have higher cost of equity capital. In contrast, the companies that have higher proportion of board independence, audit committee financial expertise and board interlocking are likely to have lower cost of equity capital.*

Keywords: *board-interlocking, board independence, modified Jones*

Introduction

The cost of capital is the amount that a company pays for the use of its capital. Understanding the association between earnings management, corporate governance and the cost of equity capital is important for the management of companies and its investors. In a contemporary operating corporation, capital suppliers are unable to fully control the spending system of their money and the decision making processes of the company (Ramly & Rashid, 2010). According to agency theory, conflicts of interest between shareholders and managers occur when managers exercise operating roles that do not align with the objective of maximising the shareholders' wealth. Of even more concern, dispersed shareholders are not able to physically investigate any self-serving interests of managers (Reverte, 2009). Since shareholders cannot observe managers' efforts and cannot discern real economic performance of the company, moral hazard and adverse selection problems can occur which result in the agency risk problem

(Fama & Jensen, 1983). Consequently, the rational investor may require higher returns from their investment in exchange for bearing these agency risks, resulting in higher cost of equity capital.

In contrast, good corporate governance is introduced as a set of mechanisms that aim to improve the effectiveness of the monitoring functions (Bedard *et al.*, 2004b; Cornett *et al.*, 2008; Hashim & Devi, 2008), limit opportunistic behaviour of managers (Klein, 2002a; Park & Shin, 2004; Davidson *et al.*, 2005a) and enhance the quality of information and disclosure (Jans *et al.*, 2007; Jo & Kim, 2007; Hermalin & Weisbach, 2010). These studies assume that corporate governance affects the firm's valuation by constraining the self-serving tendencies of insiders, maximising shareholders' wealth and, therefore, resulting in a lower cost of equity capital. According to Arthur Levitt, former Chairman of the Securities and Exchange Commission, firms with higher quality accounting standards are likely to have higher liquidity and lower cost of equity capital (Levitt, 1997). Similarly Forster (2003), a former member of the Financial Accounting Standards Board, stated that: *"More information always equates to less uncertainty, and it is clear that people pay more for certainty. Less uncertainty results in less risk and a consequent lower premium being demanded. In the context of financial information, the end result is that better disclosure results in a lower cost of capital"* (p.1). From these statements, it could be argued that regulators have agreed that a high quality of financial information could lead to the reduction of the cost of capital.

Therefore, this paper aims to investigate the influence of earnings management and corporate governance on the cost of equity capital and whether earnings management and corporate governance increases/decreases the cost of equity capital in Thai listed companies.

Literature Review

Cost of equity capital and Earnings management

Theoretical research on earnings management suggests that greater earnings management increases the cost of equity because the investors "price protect" themselves against potential losses from trading with the inappropriate accounting practices of managers. The effect of earnings management on the cost of equity capital is a matter of considerable interest and important to the financial reporting community. This is because the use of financial reporting by an investor to evaluate the stock price and the firm's performance creates an incentive for the manager to manipulate or manage the company's earnings with the view of influencing the short-term stock price (Strobl, 2013). As such, earnings management practices of management leads to less reliable financial reporting, which increases the information asymmetry between management and investors, resulting in higher cost of equity capital.

Kim and Sohn (2013) examine the influence of real earnings management on the cost of equity capital using data from US firms from 1987 to 2011 as a sample. They find that the extent of earnings management through the real activities manipulation is positively associated with the cost of equity capital. They also suggest that real earnings management activities decrease the information quality of earnings used by the investor, therefore, a higher risk premium is required to compensate these activities.

Botosan *et al.* (2004) argue that precise information mitigates information asymmetry, thereby reducing the cost of equity capital. Botosan *et al.* (2004) examine the relationship between public and private information precision and the cost of equity capital. Their key finding is an inverse relationship between public information precision and the cost of equity capital. However, they also find a positive relationship between private information precision and the cost of equity capital (Botosan *et al.*, 2004; Williams, 2004). Li (2005) examine the

preciseness of eye-catching public information that investors receive regarding the expected rate of aggregate dividend growth and the effects of the stock market return. His results show that high, precise information results in a decrease of risk premiums and stock return volatility. Furthermore, he suggests that the company should provide more precise information to reduce the cost of equity capital.

Contrary to information precision, information asymmetry is found to increase the cost of equity capital. Armstrong *et al.* (2011) investigate the relationship between information asymmetry and the cost of capital. In their study, they also investigate the conditions that influence this relationship. Their evidence suggests that when markets are imperfect, information asymmetry is positively associated with the cost of capital, and there is no association between information asymmetry and the cost of capital when markets are perfectly competitive. Even though Gray *et al.* (2009) posit that information risk is a systematic risk factor that is priced by the capital market, they find in their study of Australian firms an insignificant relationship between information asymmetry arising from managerial reporting discretion and the cost of equity. They postulate that, in this case, the requirement that the public domain receive high quality information in a non-selective disclosure and timely manner lessened most asymmetry from the information on expected cash flows during the study period. Therefore, in developing countries such as Thailand, where non-selective disclosure of high quality information in a timely manner to the public domain may not be as strictly enforced, a positive relationship between information asymmetry and the cost of equity may exist.

Kaszniak (2004) argue that a company's accounting restatement creates investor's uncertainty about management credibility, competence, and overall concerns about the quality of earnings. Accordingly, Hribar and Jenkins (2004) examine the influences of accounting restatement on a company's cost of equity capital. Their results show that accounting restatement is negatively associated with expected future earnings and is positively associated with the cost of equity capital. They also find that accounting restatements initiated by the auditor leads to the largest increase in the cost of capital.

In order to investigate the cost of equity capital when earnings management has occurred, Bhattacharya *et al.* (2003) measure the cost of equity by using two proxies: dividend yield and the international capital asset pricing model. The earning opacity is estimated from three dimensions of reported accounting earnings: earnings aggressiveness, loss avoidance, and earnings smoothing. They analyse the financial statement of the companies from 34 countries including Thailand in the period 1984-1998 to explore whether earnings management affects the cost of equity and the trading behaviour of investors. Their results reveal that higher overall earnings opacity increases the cost of equity capital and also decreases trading in the stock market by investors.

Chen *et al.* (2011) investigate the effect of the audit quality on earnings management and the cost of equity of both state-owned enterprises (SOEs) and non-state-owned enterprises (NSOEs) in China. In their study, both the industry method (Gebhardt *et al.*, 2001) and the PEG ratio method (Easton, 2004) are used as proxies for the cost of equity capital, and the audit firm's size is used as a proxy for audit quality. Using 244 listed firms on the Shanghai and Shenzhen Stock Exchanges over the period 2001-2006, Chen *et al.* (2011) show that reduced earnings management, attributable to the quality of the auditor, is associated with reducing the cost of equity. They also find that the high audit quality employed in NOSEs has a greater decrement in the cost of equity capital than the high audit quality employed in SOEs.

Additionally, Kim and Sohn (2013) examine the influence of real earnings management on the cost of equity capital using data from US firms from 1987 to 2011. They find that the extent of earnings management through the real activities manipulation is positively associated with the cost of equity capital. They also suggest that real earnings management activities

decrease the information quality of earnings used by the investor, therefore, the higher risk premium is required to compensate these activities.

Cost of equity capital and Corporate Governance

The supporting view on the effectiveness of corporate governance towards the cost of equity is provided in several theoretical studies (Cheng *et al.*, 2006; Becker-Blease & Irani, 2008; Huang *et al.*, 2009; Reverte, 2009; Upadhyay & Sriram, 2011; Dao *et al.*, 2012; Mazzotta & Veltri, 2012; Armstrong *et al.*, 2013). For example, Armstrong *et al.* (2011) indicate that when equity markets are imperfectly competitive, the information asymmetry increases the company's cost of capital. Cheng *et al.* (2006) examine the association between strong shareholder rights regimes as a proxy for good CG and the cost of equity capital in US firms. They find that firms with stronger shareholder rights regimes are significantly associated with a lower cost of equity capital. However, the study of Huang *et al.* (2009) further argues that, in firms with a high concentration of managerial ownership, strong shareholder rights are less important because these managerial ownerships' self-interests may act as a substitute for shareholders' rights. Their study finds that a high concentration of managerial ownership of the firm reduces the degree of the agency problem and lowers the cost of equity capital. Becker-Blease and Irani (2008) investigate whether CG affected adverse selection costs in seasoned equity offerings during 1996-2001. Their results show that board independence, audit committee size and managerial ownership are positively associated with a firm's abnormal stock returns. These results suggest that a perception of investors is that some particular governance systems are better able to align shareholder and manager incentives, improving the firm's access to the capital market.

Research Methodology

Estimation of Discretionary Accruals

The accruals component of earnings contains the accounting estimates based on forecasts which is easier to manage than cash flows (Larcker & Richardson, 2004). A number of previous papers have used discretionary accruals to examine whether earnings have been manipulated by managers. Since managers are more likely to use their discretion to manage earnings over short-term rather than long-term accruals (Dechow *et al.*, 1995; Teoh *et al.*, 1998), the Jones (1991) model is the most popular one used to capture short-term non-discretionary accruals. However, a fundamental problem with the Jones model is the use of change in revenues as entirely non-discretionary accruals.

Dechow *et al.* (1995) emphasize that, if earnings are managed through discretionary accruals revenues, then the Jones model will consider revenues as entirely non-discretionary. However, managers can exercise their discretion to manage earnings by shifting revenue from the future to the current period (through an increase in accounts receivables). So, the change in revenue ($\Delta REV_{i,t}$) would be endogenous to the model. To control this endogeneity bias, Dechow *et al.* (1995) modify the Jones model by assuming that all changes in credit sales in the event period result from earnings management. The reason behind the Modified Jones model is that earnings are not difficult to manage through credit sales compared to cash collections. Therefore, in the Dechow *et al.* (1995) study, they examine five models that are used for estimating discretionary accruals; including the Healy (1984) model, the DeAngelo (1988) model, the Jones (1991) model, the Modified Jones model and the industry model. They find that among these five models, the Modified Jones model is the most powerful model for detecting earnings management (Dechow *et al.*, 1995; Ahmad-Zaluki *et al.*, 2011). Therefore,

the models used to examine non-discretionary accruals in this study are based on the Modified Jones model.

Modified Jones Model (1995)

A vast amount of literature estimates discretionary accruals using the Jones (1991) model. The model attempts to control the effects of change in the firm's economic circumstances in estimating a firm's nondiscretionary accruals. However, Dechow *et al.* (1995) found weaknesses in the original Jones (1991) model. According to them, the original Jones model is unable to capture the impact of sales-based manipulation because accounts receivables should not be considered as non-discretionary accruals. Thus, they proposed a modification to the original Jones model which came to be known as the Modified Jones model. The non-discretionary accruals based on the Modified Jones model are computed from the equation as follows:

$$NDA_{i,t} = \alpha_1 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}} \right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) \quad (\text{Eq. 1})$$

Where:

$NDA_{i,t}$	=	non-discretionary accruals for firm i , year t
$A_{i,t-1}$	=	lagged assets of firm i , year t
$\Delta REV_{i,t}$	=	change in revenues of firm i , year t
$\Delta AR_{i,t}$	=	change in accounts receivable of firm i , year t
$PPE_{i,t}$	=	property, plant and equipment of firm i , year t
$\alpha_1, \alpha_2, \alpha_3$	=	firm-specific parameters

Performance Matched Discretionary Accruals Model (2005)

This study also tests for earnings management by employing an extended version of the Modified Jones model used by Kothari *et al.* (2005), which is called Performance Matched Discretionary Accruals Model, as the alternative model. This model is calculated by placing ROA into the Modified Jones model. Similar to Kothari *et al.* (2005), this study applies both return on assets of the current year (ROA_t) and lagged return on assets (ROA_{t-1}) into the Modified Jones model. To avoid potential problems related with changing a tax rate in Thailand, ROA is estimated by using earnings before interest and tax expense divided by total assets. This estimation is similar to Bedard *et al.* (2004a), Jones *et al.* (2008) and Kothari *et al.* (2005).

Performance Matched Discretionary Accruals Model (current ROA)

$$NDA_{i,t} = \alpha_1 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}} \right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \alpha_4 (ROA_{i,t}) \quad (\text{Eq. 2})$$

Where:

$NDA_{i,t}$	=	non-discretionary accruals for firm i , year t
$A_{i,t-1}$	=	lagged assets of firm i , year t
$\Delta REV_{i,t}$	=	change in revenues of firm i , year t
$\Delta AR_{i,t}$	=	change in accounts receivable of firm i , year t
$PPE_{i,t}$	=	property, plant and equipment of firm i , year t
ROA	=	return on assets of firm i , year t
$\alpha_1, \alpha_2, \alpha_3, \alpha_4$	=	firm-specific parameters

Performance Matched Discretionary Accruals Model (Lagged ROA)

$$NDA_{i,t} = \alpha_1 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}} \right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \alpha_4 (ROA_{i,t-1}) \quad (\text{Eq. 3})$$

Where:

$NDA_{i,t}$	=	non-discretionary for firm i , year t
$A_{i,t-1}$	=	lagged assets of firm i , year t
$\Delta REV_{i,t}$	=	change in revenues of firm i , year t
$\Delta AR_{i,t}$	=	change in accounts receivable of firm i , year t
$PPE_{i,t}$	=	property, plant and equipment of firm i , year t
ROA_{t-1}	=	lagged return on assets of firm i , year t
$\alpha_1, \alpha_2, \alpha_3, \alpha_4$	=	firm-specific parameters

Cash flow Modified Jones Model (2000)

The Cash flow Modified Jones model was first proposed by Kasznik (1999). In his paper, he investigates the relationship between voluntary disclosure and earnings management. Kasznik (1999) includes change in operating cash flows as an explanatory variable in the Modified Jones model which was originally developed by Dechow *et al.* (1995). Kasznik's reason for including the change in cash flow from operations is based on evidence from Dechow (1994) that CFO is negatively correlated with total accruals. Furthermore, Jeter and Shivakumar (1999) introduce variables to control for changes in cash flows over time. They suggest that this extension of the Jones model is shown to be well specified for all cash flow levels and to exhibit more power than the conventional Jones model in detecting earnings management. Therefore, this study also tests for earnings management by employing an extended version of the modified Jones model introduced by Kasznik (1999) and used in Shuto (2007); Huang *et al.* (2013); Kubota *et al.* (2010); Osma and Noguer (2007); Sun and Rath (2009); and Teshima and Shuto (2008) who include the change in CFO as an additional explanatory variable. The model is expressed as follows:

$$NDA_{i,t} = \alpha_1 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}} \right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \alpha_4 \left(\frac{\Delta CFO_{i,t}}{A_{i,t-1}} \right) \quad (\text{Eq. 4})$$

Where:

$NDA_{i,t}$	=	non-discretionary accruals for firm i , year t
$A_{i,t-1}$	=	lagged assets of firm i , year t
$\Delta REV_{i,t}$	=	change in revenues of firm i , year t
$\Delta AR_{i,t}$	=	change in accounts receivable of firm i , year t
$PPE_{i,t}$	=	property, plant and equipment of firm i , year t
$\Delta CFO_{i,t}$	=	change in cash flow from operation of firm i , year t
$\alpha_1, \alpha_2, \alpha_3, \alpha_4$	=	firm-specific parameters

Modified Jones Model with Cash Flows and Book to Market (2004)

The Modified Jones model with book to market and cash flows was first used to estimate the discretionary accruals (unexpected accruals or abnormal accruals) component by Larcker and Richardson (2004). For this approach, book to market ratio (BTM) and CFO are incorporated into the Modified Jones model to reduce measurement error related to discretionary accruals. Larcker and Richardson (2004) indicate that BTM controls expected growth in operation. They point out that phases of growth in the life cycle of a firm are likely to be associated with investment in inventory and other assets. In this situation, observation of an inventory increase may not necessarily indicate any opportunistic behaviour on the part of management. Therefore, if BTM is left uncontrolled, the Modified Jones model will classify such increases

as discretionary accruals because, under normal circumstances, growing firms have large accruals. In addition, CFO controls the current operating performance. Dechow *et al.* (1995) find that discretionary accruals are likely to be mis-specified for companies with extreme levels of performance.

Larcker and Richardson (2004) remark that their model is more advanced than the Modified Jones model in the following ways: its powers of explanation are superior, it provides identification of accruals that are unexpected and less constant than other earnings' components, discretionary accruals related to lower earnings and lower stock returns in future periods can be identified, and the estimation of discretionary accruals allows for the detection of earnings management pinpointed in enforcement actions taken by the SEC. Hence, the other measurement of discretionary accruals used in this study is based on equation (5) as shown below:

$$NDA_{i,t} = \alpha_1 \left(\frac{1}{A_{i,t-1}} \right) + \alpha_2 \left(\frac{\Delta REV_{i,t} - \Delta AR_{i,t}}{A_{i,t-1}} \right) + \alpha_3 \left(\frac{PPE_{i,t}}{A_{i,t-1}} \right) + \alpha_4 \left(\frac{CFO_{i,t}}{A_{i,t-1}} \right) + \alpha_5 (BTM_{i,t}) \quad (\text{Eq. 5})$$

Where:

$NDA_{i,t}$	=	non-discretionary accruals for firm i , year t
$A_{i,t-1}$	=	lagged assets of firm i , year t
$\Delta REV_{i,t}$	=	change in revenues of firm i , year t
$\Delta AR_{i,t}$	=	change in accounts receivable of firm i , year t
$PPE_{i,t}$	=	property, plant and equipment of firm i , year t
$CFO_{i,t}$	=	cash flow from operation of firm i , year t
$BTM_{i,t}$	=	book to market ratio of firm i , year t
$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$	=	firm-specific parameters

Measurement of Discretionary Accruals

As it can be seen above, the starting point for the measurement of discretionary accruals is total accruals. Since total accruals comprises normal accruals (expected accruals) and abnormal accruals (discretionary accruals or unexpected accruals), discretionary accruals ($DA_{i,t}$) as a proxy for earnings management is calculated as:

$$DA_{i,t} = \frac{ToACC_{i,t}}{A_{i,t-1}} - NDA_{i,t} \quad (\text{Eq. 6})$$

Where:

$DA_{i,t}$	=	discretionary accruals of firm i , year t
$ToACC_{i,t}$	=	total current accruals of firm i , year t
$A_{i,t-1}$	=	lagged assets of firm i , year t
$NDA_{i,t}$	=	non-discretionary accruals

It is important also to note that there is a difference in this study from prior studies. This difference is the use of net PPE instead of gross PPE. Similar to the studies by Chen *et al.* (2005); Jaggi *et al.* (2009); Saleh and Ahmed (2005) and Lee *et al.* (2007), the data on gross PPE is not available in the SETSMART and SETINFO databases. As a result, the net PPE is used in this study.

OLS linear regressions are used to estimate the firm specific parameters in each fiscal year for each industry. This estimation allows firm specific parameters to vary over time and by industries. Similar to prior studies, industry portfolios are comprised of at least 10 companies (Ahmad-Zaluki *et al.*, 2011). It is important to note that the company specific parameters α_1 , α_2 , α_3 are estimated from the original Jones model.

Measurement of Cost of Equity Capital

This section discusses techniques used for estimating the COE for this study. This study uses three different models: CAPM and Industry Adjusted Earning to Price Ratio to estimate the COE for Thai listed companies during 2003-2010.

Capital Asset Pricing Model (CAPM)

The concept of the CAPM was initially developed by Sharpe (1964), Lintner (1965) and Black (1972), resulting in a Nobel Prize for Sharpe in 1990 (Fama & French, 2004). The main idea of CAPM is to explain the expected return by a market beta (β) or by systematic risk. The CAPM is used to measure risk and the relationship between expected return and risk. The assumption was that expected return should have a positive relationship with market beta. However, in the late 1970s, this concept of CAPM has been questioned and disputed by a number of empirical studies. These studies indicate that market beta alone is not sufficient to explain expected return, and expected return is unrelated to market beta (Basu, 1977; Banz, 1981; Rosenberg *et al.*, 1985; Bhandari, 1988). Fama and French (1992) and (1993) therefore extended the CAPM by adding two risk factors: size and book-to-market equity ratio. However, Fama and French (1996) and Elton (1999) find that using the Fama-French model to estimate the expected return is not better than using the CAPM. Similarly, King (2009) uses the CAPM and the Fama-French model to estimate the cost of equity for banks in six countries during 1990-2009. They find that the results from both models are similar.

Even if some authors suggest that caution should be exercised when using the CAPM to calculate the cost of capital, a recent study by Da *et al.* (2012) indicate that there is little direct evidence to support an avoidance of CAPM to estimate the cost of capital. Their findings confirm the view that the CAPM provides a reasonable estimate of a project's cost of capital. Furthermore, Welch (2008) finds that 75 per cent of finance professors recommend using the CAPM for corporate capital budgeting purposes; 10 per cent recommend the Fama-French model; 5 per cent recommend an APT model. A survey of 392 chief financial officers by Graham and Harvey (2001) shows that 73.5 per cent of respondents reported that they always or nearly always use the CAPM, thus indicating that estimating equity capital costs through CAPM is the most popular method. In other words, the CAPM continues to be the most commonly used method among academics, researchers, practitioners for estimating the COE (Ashton, 1995; Kielholz, 2000; Graham & Harvey, 2001; Jagannathan & Meier, 2002; Harris *et al.*, 2003; Welch, 2008). Therefore, in this study, the CAPM is used to estimate the COE. The equation for CAPM is shown as follows:

$$CAPM_{i,t} = Rf_t + \beta_{i,t} \times (Rm_t - Rf_t) \quad (\text{Eq. 7})$$

Where:

$CAPM_{i,t}$	= cost of equity capital calculated from Capital Asset Pricing model
Rf_t	= risk free rate on the 91-day Thai Government Treasury bill
$\beta_{i,t}$	= beta of stock i , year t , using "Market model" to estimate the slope coefficient by regressing company's stock return against the market's return.
Rm_t	= market rate of return
Or $(Rm_t - Rf_t)$	= risk premium

Industry Adjusted Earnings to Price Ratio

Following Francis *et al.* (2005) and Gray *et al.* (2009), this study also uses industry-adjusted earnings to price ratio (*IndEP*) as a proxy for the COE. Francis *et al.* (2005) view the price-earnings ratio as an inverse indicator of the COE. In their study, they examine the relationship between accruals quality and industry-adjusted earnings-price ratios as a proxy for the COE. Similar to their studies, to estimate industry-adjusted earnings to price ratio, this study first calculated the median E/P ratio for all firms with only positive earnings in year *t* in each of the seven main industry groups of the stock exchange of Thailand. The industry adjusted earnings to price ratio (*IndEP*) is calculated from the firms' earnings to price ratio less the median E/P ratio of all firms within the same industry in year *t*. The equation of the industry adjusted earnings to price ratio is as follows:

$$INDEP_{i,t} = EP\ ratio_{i,t} - Med\ EP\ ratio_t \quad (Eq. 8)$$

Where:

$INDEP_{i,t}$	= cost of equity capital based on Industry adjusted E/P ratio
$EP\ ratio_{i,t}$	= earnings to price ratio of firm <i>i</i> , year <i>t</i>
$Med\ EP\ ratio_{i,t}$	= median earnings to price ratio of all firms within the same industry in year <i>t</i>

Research Findings

Descriptive Statistics

Table 1 reports the descriptive statistics for related variables. Firstly, COE variables are estimated from the Capital Asset Pricing model (*CAPM*) and Industry Adjusted Earnings to Price Ratio model (*INDUSEP*). Secondly, earnings management variables are estimated from the Modified Jones model (*|EMMJ|*), Performance Matched discretionary accruals model (*|EMPMt|* and *|EMPMt-1|*), Cash Flow Modified Jones model (*|EMCF|*) and Modified Jones model with cash flows and book to market (*|EMCFBM|*). Thirdly, CG variables: board interlocking, board independence, board size, audit committee expertise, managerial ownership and institutional ownerships, are used in this study. Lastly, the control variables are also included in this study to minimise specification bias.

Descriptive statistics in Table 1 show that, on average, the COE in Thailand during 2003-2010 estimated from the CAPM and INDUSEP is 16.5 per cent and 7.6 per cent respectively. Since market beta is 1, it is expected that average BETA of a large sample of the firms to be similar to that of the market beta. However, this table shows that on average, BETA is 0.566, which is far below 1. This may be because 5 per cent of the highest value of beta is winsorized and financial companies groups are excluded in this study. As well, this table shows that, on average, risk free rate and market return are 2.4 per cent and 19.4 per cent, respectively. The level of earnings management (*|EMMJ|*, *|EMPMt|*, *|EMPMt-1|*, *|EMCF|* and *|EMCFBM|*) estimated from four different models consistently has an average between 8 per cent to 10 per cent. The descriptive statistics for board interlocking (BINT), board independence (BIND) and board size variables (BSIZE) demonstrate the following: (1). On average, Thai listed companies have 10 directors on the board, (2).

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Table 1 Descriptive statistics for all variables

Panel A: Continuous variables									
Variables	Mean	Sd Dev.	Min	Max	Lower Quartile (p25)	Median (p50)	Upper Quartile (p75)	Skewness	Kurtosis
capm	0.165	0.168	-1.380	1.062	0.048	0.104	0.229	1.200	7.240
indusep	0.076	0.117	0.000	1.358	0.018	0.042	0.086	4.927	37.065
beta	0.566	0.445	-0.100	1.690	0.210	0.470	0.850	0.694	2.716
riskfeerate	0.024	0.012	0.012	0.047	0.013	0.021	0.033	0.563	1.959
marketreturn	0.194	0.196	-0.087	0.489	0.028	0.164	0.384	0.063	1.676
emmj	0.104	0.135	0.000	2.314	0.031	0.068	0.130	6.253	73.400
empmt	0.084	0.114	0.000	2.387	0.026	0.056	0.107	7.546	108.155
empmt1	0.094	0.127	0.000	2.362	0.028	0.061	0.118	6.908	89.080
emcf	0.083	0.091	0.000	2.030	0.028	0.061	0.109	6.294	99.704
emcfbm	0.104	0.110	0.000	2.243	0.039	0.081	0.137	5.902	80.096
bint	0.247	0.231	0.000	1.000	0.077	0.200	0.375	1.092	3.926
bind	0.345	0.110	0.000	0.830	0.273	0.333	0.400	0.475	4.395
bsize	10.840	2.819	3.000	25.000	9.000	10.000	12.000	0.917	4.745
acexpert	0.394	0.302	0.000	1.000	0.250	0.333	0.667	0.353	2.315
mngown	0.053	0.137	0.000	0.861	0.000	0.000	0.006	3.178	13.093
inssahare	0.033	0.104	0.000	0.977	0.000	0.001	0.007	5.260	35.780
roa	0.066	0.118	-0.636	0.574	0.020	0.069	0.124	-1.303	12.387
lev	0.415	0.363	0.001	9.693	0.217	0.386	0.563	9.896	199.776
cfo	0.054	0.616	-29.481	8.739	0.002	0.060	0.129	-39.996	1981.566
logasset	14.921	1.379	11.427	20.464	13.941	14.662	15.684	0.787	3.680
mtb	1.718	3.330	0.010	79.530	0.650	1.070	1.890	13.870	260.312
block	0.113	0.182	0.000	0.930	0.000	0.000	0.152	1.814	5.597

Panel B: Dichotomous variables

Variables	Sector							
	All		Ago & Food		Industrials		Services	
	0	1	0	1	0	1	0	1

Ceodual	Frequency	2,053	785	217	99	337	163	468	172
	Percentage	72.34	27.66	68.67	31.33	67.40	32.60	73.13	26.88
Adopin	Frequency	1,886	856	219	91	362	120	457	148
	Percentage	68.78	31.22	70.65	29.35	75.10	24.90	75.54	24.46
Big4	Frequency	1,400	1,266	121	164	262	208	334	263
	Percentage	52.51	47.49	42.46	57.54	55.74	44.26	55.95	44.05
IFRS	Frequency	1,950	1,170	205	123	350	210	425	255
	Percentage	62.50	37.50	62.50	37.50	62.50	37.50	62.50	37.50

Variables		Sector							
		Property & construction		Technology		Resources		Consumer products	
		0	1	0	1	0	1	0	1
Ceodual	Frequency	464	185	226	31	155	22	186	113
	Percentage	71.49	28.51	87.94	12.06	87.57	12.43	62.21	37.79
Adopin	Frequency	399	226	177	77	85	87	187	107
	Percentage	63.84	36.16	69.69	30.31	49.42	50.58	63.61	36.39
Big4	Frequency	336	279	91	157	81	86	175	109
	Percentage	54.63	45.37	36.69	63.31	48.50	51.50	61.62	38.38
IFRS	Frequency	450	270	185	111	135	81	200	120
	Percentage	62.50	37.50	62.50	37.50	62.50	37.50	62.50	37.50

Note: capm is cost of equity capital estimated from Capital Asset Pricing model, indusep is cost of equity capital estimated from Industry Adjusted Earnings to Price Ratio, beta is systematic risk, riskfreerate is risk free rate on the 91-day Thai Government treasury bill, marketreturn is market rate of return, |emmj| is absolute value of earnings management estimated from the Modified Jones model, |empmt| is absolute value of earnings management estimated from the Performance Matched Discretionary Accruals model (current ROA), |empmt-1| is absolute value of earnings management estimated from Performance Matched Discretionary Accruals model (lagged ROA), |emcf| is absolute value of earnings management estimated from Cash Flow Modified Jones model, |emcfbm| is absolute value of earnings management estimated from the Modified Jones model with cash flows and book to market, bint is percentage of board directors that hold multiple board positions in Thai listed companies, bind is proportion of independent directors on board of directors, bsize is total number of board members, ceodual is dummy variable, the value of “1” if the CEO also served as chairman of the board “0” if the two positions are occupied by different individuals, acexpert is the proportion of the financial expertise on the audit committee, adopin is dummy variable; the value of “1” if the company received an audit modified opinion (qualified, adverse, or disclaimer opinions), and “0” otherwise, mngown is total percentage of shares owned by managerial directors, insshare is total percentage of shares held by institutional shareholders, roa is return on assets, lev is leverage ratio, cfo is cash flow from operation, logasset is natural logarithm of total assets, big4 is dummy variable, the value of “1” if the company’s financial statements are audited by big 4 firms

and “0” otherwise, mtb is book to market ratio, block is total percentage of shares held by individual and unaffiliated owners who own 5% or more of sample firm’s stock, ifrs is dummy variable with the value of “1” if firm’s financial statements are fully complied with international financial reporting standards and “0” otherwise.

From these 10 board members, an average of 25 per cent hold multiple board positions on other Thai listed companies and, (3). 35 per cent are independent. Of these members, the proportion of audit committee expertise in Thai listed companies is on average 39 per cent. This means that one in three members has working experience in accounting, auditing and finance, and has professional accounting qualifications, such as being a CPA. In terms of ownership structure, averages of 5 per cent of total shares are owned by managerial directors of the company, and 3 per cent by institutional shareholders, such as insurance companies, banks, pensions, mutual funds and investment banks. ROA has mean and median values of 6.6 per cent and 6.9 per cent, respectively while the maximum value is 57 per cent; this ratio shows that the higher the ROA is, the more money a company is earning with less capital investment. However, the minimum value of ROA is -64 per cent, which means that the company has invested a huge amount of capital into the business while simultaneously receiving little income from its investment. Table 6.1 shows that the negative ROA of the companies mostly occurred in 2003 after the Asian financial crisis. LEV has mean and median values of 0.42 and 0.39, respectively while the minimum value is 0.001. CFO has mean and median values of 0.05 and 0.06, respectively while the minimum value is -29.48. The company’s size (LOGGASSET) has mean and median values of 14.92 and 14.66, respectively, while the minimum value is 11.43. (MTB) has mean and median values of 1.72 and 1.07, respectively. A substantial shareholder (BLOCK) has mean value of 11 per cent which means that in a Thai listed company, there will be on average 11 per cent of shares held by individual and unaffiliated owners who own 5 per cent or more of the firm’s stock.

Panel B of Table 1 presents the descriptive statistics of dichotomous variables used in this study. The table shows that, overall, listed companies in Thailand have 28 per cent of their board directors holding multiple board positions in other Thai listed companies, and most are directors in consumer products companies. For audit opinion, more companies received unqualified opinions are than those that received qualified opinions. Overall, 31 per cent of companies in the sample received a modified audit opinion (qualified, adverse and disclaimer). The resource sector maintained the highest percentage of companies receiving a modified audit opinion; just over half of the companies. In contrast, only 24 per cent of companies in the services sector received a modified audit opinion. In terms of the Big-4 variable, 47 per cent of all companies assessed have their financial statements audited by the Big-4 audit firms. The sector with the highest percentage of firms audited by the Big-4 is the technology sector, with just over 63 per cent of companies audited by these firms. FAP initiated a program to merge TAS with IAS/IFRS, and most of these new/revised/replaced TAS became effective from 2008 onward. The selected samples in this study are not SMEs and financial institutions where exemption of certain TAS is applied. This study assumes that all selected companies sampled are required to apply TAS.

The Regression Analysis on the Influence of Earnings Management and Corporate Governance on Cost of Equity Capital

The use of financial reporting by investors to evaluate the share price and the performance of the companies creates the motivation for managers to manage the reported earnings with the view to influencing investors’ decisions. Earnings management leads to less reliability of financial reporting, which increases investors’ uncertainty about their investments (Healy & Wahlen, 1999). Therefore, investors will price protect themselves against potential losses caused by adverse decision making and trading employed by managers who use inappropriate

accounting practices and thereby increase the COE (Bhattacharya *et al.*, 2003; Poshakwale & Courtis, 2005). In the modern operating environment, dispersed shareholders as capital suppliers are unable to physically investigate the uses of a company's capital and the decision making processes of managers. When shareholders cannot discern management's efforts and the real economic performance of a company, adverse selection, moral hazard and information asymmetry problems may occur (Fama & Jensen, 1983). To overcome these problems, CG mechanisms have been introduced to improve the quality of the monitoring functions (Bedard & Johnstone, 2004), control the aggressive behaviour of managers (Klein, 2002b; Park & Shin, 2004; Davidson *et al.*, 2005b) and improve the quality of financial information and disclosure (Jans *et al.*, 2007; Hermalin & Weisbach, 2010).

The results of the influence of earnings management and corporate governance are presented and discussed in following sections.

Regression Results for Panel Data

The panel data with fixed effects is tested in this study to examine the influence of earnings management and CG on the COE for panel data. Table 2 presents the results of the influence of earnings management and CG on the COE in Thai listed companies during the period 2003 to 2010. The results of these regression analyses are further discussed as follows:

The Influence of Earnings Management on the Cost of Equity Capital: the Fixed Effects Panel Regression

Firstly, models (1) to (5) of Table 2 report the regression results of the relationship between the cost of equity capital (CAPM) and earnings management ($|EMMJ|$, $|EMPMt|$, $|EMPMt-1|$, $|EMCF|$, and $|EMCFBM|$). From these models, models (2) and (3) show that the COE (CAPM) is positively associated with earnings management estimated from the Performance Matched discretionary accruals model with current ROA ($|EMPMt|$) at $P < 0.10$ with a t-statistics of 1.74 and the Performance Matched discretionary accruals with lagged ROA ($|EMPMt-1|$) at $P < 0.10$ with a t-statistics of 1.96.

Secondly, when the COE is estimated from the industry adjusted earnings to price ratio model (INDEP) as the dependent variables in models (6) to (10) of Table 2, the results show that the COE (INDEP) is positively associated with earnings management in all five models; the Modified Jones model ($|EMMJ|$) at $P < 0.01$ with a t-statistics of 2.92, the Performance Matched discretionary accruals with current ROA ($|EMPMt|$) at $P < 0.01$ with a t-statistics of 2.81, the Performance Matched discretionary accruals with lagged ROA ($|EMPMt-1|$) at $P < 0.01$ with a t-statistics of 2.92, the Cash Flow Modified Jones model ($|EMCF|$) at $P < 0.01$ with a t-statistics of 3.49, and the Modified Jones model with cash flow and book to market ($|EMCFBM|$) at $P < 0.01$ with a t-statistics of 2.39.

From the results presented, it can be concluded that earnings management creates imprecise financial information (Healy & Wahlen, 1999) for investors. The evidence that the imprecise financial information results in higher cost of equity is consistent with the conclusions made by Botosan *et al.* (2004), Li (2005) and Armstrong *et al.* (2011) who report that imprecise financial information enhances information asymmetry, risk premiums and stock return volatility, thereby increasing the COE. Similarly, Kasznik (2004) argues that accounting restatement creates investor's uncertainty about management credibility, competence and overall concerns about the quality of earnings. In addition to this argument, Hribar and Jenkins (2004) provide evidence that accounting restatement is positively associated with the COE.

The results of this study are also consistent with those of Bhattacharya *et al.* (2003), where the COE is measured using dividend yield and the international CAPM and earnings management are measured from three dimensions of reported accounting earnings, including earnings aggressiveness, loss avoidance and earnings smoothing. Their results reveal that earnings management increased the COE in 34 countries, including Thailand. Likewise, Chen *et al.* (2011) find that reduced earnings management, attributable to the quality of the auditor, is associated with a reduction in the COE. In their study, both the industry method (Gebhardt *et al.*, 2001) and the PEG ratio method (Easton, 2004), which is also used in this study, are used as proxies for the COE. Additionally, the results of this study are similar to the results of Kim and Sohn (2013), which confirms that the quality of financial information is reduced when earnings management practice occurs, consequently increasing the COE.

In conclusion, the result of fixed effects regression supports the proposition that greater earnings management creates the investor uncertainty about the quality of financial reporting and accounting practice of managers. Consequently, the rational investor requires higher returns from their investment in exchange for bearing these uncertainties, resulting in higher company COE. Particularly, these results are robust across five different measures of earnings management and different measures of the COE.

The Influence of Corporate Governance on the Cost of Equity Capital: the Fixed Effects Panel Regression

Table 2 also shows the effect of CG (BINT, BIND, BSIZE, CEODUAL, ACEXPRT, ADOPIN, MNGOWN, and INSSHARE) on the COE (CAPM and INDEP). The regression models are the same as used earlier for the pooled data set. The results of the regression analyses for panel data are reported in models (1) to (10) of this table.

Models (1) to (2) of this table show the effect of CG (BINT, BIND, BSIZE, CEODUAL, ACEXPRT, ADOPIN, MNGOWN, and INSSHARE) on the COE (CAPM). The results show that only three out of the eight CG variables are found to be associated with the COE. BIND is found to be significantly negatively associated with the COE (CAPM) for all five models (models 1-5) at $P < 0.01$ with t-statistics of -5.24, -5.08, -5.16, -5.31 and -5.05 respectively. This result is consistent with the findings of Dechow *et al.* (1996) that board independence decreases the likelihood of fraudulent financial statements. Similarly, Reverte (2009) and Mazzotta and Veltri (2012) find that board independence reduces the COE.

ACEXPRT is also found to be significantly negatively associated with the COE (CAPM) for all five models (models 1-5) at $P < 0.05$ with t-statistics of -2.32, -2.26, -2.23, -2.31 and -2.34 respectively. These results suggest that a higher proportion of financial expertise on the audit committee improves the quality and transparency of the financial reports. Increased transparency in the financial reports results in less uncertainty for investors, which results in a lower COE. This result is similar to that of Dao *et al.* (2012) who provide evidence that the COE is lower in companies with an audit committee which has long-term working experience. This is because investors are more likely to trust the audit committee's financial experiences. Therefore, it could be argued that the audit committee members who have experience or a background in accounting and finance are likely to deal with complexities of financial reporting effectively, which can reduce the COE.

Moreover, MNGOWN has a significant positive association with the COE (CAPM) for all five models (models 16-20) at $P < 0.01$ with t-statistics of 3.03, 3.24, 3.27, 3.17 and 3.26 respectively. These results indicate that managerial shareholders who mainly control decisions made at board meetings have an information advantage over other shareholders. Therefore, they may use their power inappropriately to achieve their own interest at the expense of the other shareholders. As well, their controlling power can increase the investment risk and

information asymmetry of other shareholders, thereby increasing the agency problem and the COE. However, this finding is in contrast to the finding of Huang *et al.* (2009), which shows that high concentrations of managerial ownership reduces the degree of agency problems and lowers the COE.

For control variables, the results show that ROA, MTB, BLOCK, and BETA have significant positive associations with the CAPM. However, LEV, LOGASSET and IFRS are found to be negatively associated with the COE.

Models (6) to (10) of Table 2 report the relationship between CG (BINT, BIND, BSIZE, CEODUAL, ACEXPERT, ADOPIN, MNGOWN, and INSSHARE) and the COE (INDEP). The results show that three out of the eight CG variables are found to be associated with the COE.

For example, BINT is found to be negatively associated with the COE (INDEP) for all five models (models 6-10) at $P < 0.01$ with t-statistics of -3.44, -3.07, -3.10, -3.38 and -3.66 respectively.

CEODUAL is found to have a positive relationship with the COE (INDEP) for all five models (models 6-10). For models (6) to (9), the coefficients are significant at $P < 0.10$ with t-statistics of 1.84, 1.93, 1.97, and 1.92 respectively. For model (10), the coefficient is significant at $P < 0.05$ with t-statistics of 2.02. These results suggest that the companies which have the CEO also simultaneously performing the duty of chairman on the board of directors are more likely to have higher COE compared to companies that have the CEO and chairman positions occupied by different individuals. Klein (2002a) argue that a board whose CEO also sits in a monitoring position as chairman is less likely to investigate the work of CEOs and other executives. In addition, Boyd (1994) posits that CEO-duality increases agency costs between management and shareholders, which therefore increases the COE of the companies.

ADOPIN is found to have a positive relationship with the COE (INDEP) for all five models (models 6-10). For models (6) to (9), the coefficients are significant at $P < 0.10$ with t-statistics of 1.92, 1.95, 1.88, and 1.86 respectively. For model (10), the coefficient is significant at $P < 0.05$ with t-statistics of 2.35. These results suggest that the modified audit opinion provides a signal to investors that there are material misstatements in the financial statements of the companies. Therefore, a higher return is required to offset risky investment.

However, INSSHARE is found to be significantly positively associated with the COE (INDEP). Contrary to conventional expectations, the results of this table show that companies with higher institutional shareholders have a higher COE, suggesting that institutional shareholders collide or collude with managerial owners to pursue strategic-alignment objectives, such as not performing adequate monitoring. This result is consistent with the finding in the Regalli and Soana (2012) study, which shows that companies with a greater percentage of institutional ownership are likely to have a higher COE. Based on the institution's perspective regarding the profitability of the company, Jiang and Anandarajan (2009) argue that, if institutional investors focus on short-term profitability, they could pressure a manager to exercise aggressive accounting practices with the purpose of increasing the value of the institution's share in the short-term.

THE IMPACT OF CORPORATE GOVERNANCE AND EARNINGS MANAGEMENT PRACTICES ON COST OF EQUITY CAPITAL: EVIDENCE FROM THAI LISTED COMPANIES

Table 2: Regression results for panel data with fixed effects

	Capital Asset Pricing model (CAPM)					Industry Adjusted Earning to Price Ratio model (INDEP)				
	CAPM	CAPM	CAPM	CAPM	CAPM	INDEP	INDEP	INDEP	INDEP	INDEP
	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)	(Model 8)	(Model 9)	(Model 10)
emmj	0.034					0.090***				
	(1.58)					(2.92)				
empmt		0.048*					0.080***			
		(1.74)					(2.81)			
empmt1			0.045*					0.101***		
			(1.96)					(2.92)		
emcf				0.001					0.160***	
				(0.04)					(3.49)	
emcfbm					-0.025					0.060**
					(-1.89)					(2.39)
bint	-0.008	-0.006	-0.006	-0.007	-0.006	-0.038***	-0.033***	-0.034***	-0.037***	-0.043***
	(-1.38)	(-1.09)	(-1.15)	(-1.32)	(-1.10)	(-3.44)	(-3.07)	(-3.10)	(-3.38)	(-3.66)
bind	-0.110***	-0.107***	-0.109***	-0.111***	-0.106***	0.003	0.010	0.008	-0.001	-0.004
	(-5.24)	(-5.08)	(-5.16)	(-5.31)	(-5.05)	(0.08)	(0.34)	(0.26)	(-0.03)	(-0.12)
bsize	-0.001	-0.001	-0.001	-0.001	-0.001	0.001	0.001	0.001	0.001	0.001

	Capital Asset Pricing model (CAPM)					Industry Adjusted Earning to Price Ratio model (INDEP)				
	CAPM	CAPM	CAPM	CAPM	CAPM	INDEP	INDEP	INDEP	INDEP	INDEP
	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)	(Model 8)	(Model 9)	(Model 10)
	(-1.07)	(-0.99)	(-1.04)	(-1.17)	(-1.23)	(0.64)	(0.48)	(0.48)	(0.53)	(0.53)
ceodual	-0.001	-0.001	-0.001	-0.001	-0.001	0.013*	0.014*	0.014**	0.014*	0.016**
	(-0.29)	(-0.27)	(-0.21)	(-0.25)	(-0.39)	(1.84)	(1.93)	(1.97)	(1.92)	(2.02)
acexpert	-0.013**	-0.012**	-0.012**	-0.012**	-0.012**	-0.013	-0.013	-0.013	-0.013	-0.013
	(-2.32)	(-2.26)	(-2.23)	(-2.31)	(-2.34)	(-1.19)	(-1.21)	(-1.15)	(-1.14)	(-1.09)
adopin	0.002	0.002	0.002	0.003	0.003	0.012*	0.012*	0.012*	0.012*	0.015**
	(0.58)	(0.57)	(0.48)	(0.82)	(0.84)	(1.92)	(1.95)	(1.88)	(1.86)	(2.35)
mngown	0.033***	0.035***	0.035***	0.034***	0.035***	0.022	0.027	0.027	0.024	0.030
	(3.03)	(3.24)	(3.27)	(3.17)	(3.26)	(1.12)	(1.36)	(1.33)	(1.18)	(1.44)
insshare	0.002	0.001	0.002	-0.001	0.002	0.018	0.020	0.021	0.016	0.020
	(0.08)	(0.05)	(0.09)	(-0.03)	(0.11)	(0.67)	(0.73)	(0.77)	(0.60)	(0.70)
roa	0.039**			0.040**	0.047***	0.148*			0.137*	0.084
	(2.21)			(2.33)	(2.94)	(1.87)			(1.79)	(1.15)

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	Capital Asset Pricing model (CAPM)					Industry Adjusted Earning to Price Ratio model (INDEP)				
	CAPM	CAPM	CAPM	CAPM	CAPM	INDEP	INDEP	INDEP	INDEP	INDEP
	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)	(Model 8)	(Model 9)	(Model 10)
lev	-0.009	-0.015*	-0.015*	-0.007	-0.000	0.075***	0.060***	0.058***	0.075***	0.056***
	(-1.00)	(-1.66)	(-1.72)	(-0.72)	(-0.06)	(3.86)	(3.42)	(3.26)	(3.90)	(2.94)
cfo	-0.001	0.001	0.000			0.006**	0.006**	0.007**		
	(-0.52)	(0.41)	(0.21)			(2.05)	(2.17)	(2.24)		
logasset	-0.004***	-0.003**	-0.003**	-0.004***	-0.004***	-0.001	-0.000	-0.000	-0.001	-0.001
	(-2.73)	(-2.22)	(-2.20)	(-2.70)	(-2.64)	(-0.26)	(-0.09)	(-0.09)	(-0.40)	(-0.31)
mtb	0.002*	0.002*	0.002*	0.002*		-0.016***	-0.014***	-0.014***	-0.015***	
	(1.75)	(1.75)	(1.79)	(1.75)		(-2.81)	(-3.03)	(-2.94)	(-2.82)	
big4	-0.004	-0.004	-0.004	-0.004	-0.004	-0.016**	-0.015**	-0.015**	-0.015**	-0.015**
	(-1.09)	(-1.12)	(-1.03)	(-1.12)	(-1.17)	(-2.32)	(-2.26)	(-2.25)	(-2.16)	(-2.12)
block	0.000*	0.000*	0.000*	0.000	0.000*	0.000	0.000	0.000	0.000	0.000
	(1.70)	(1.65)	(1.67)	(1.54)	(1.73)	(0.33)	(0.26)	(0.17)	(0.18)	(0.26)
beta	0.313***	0.312***	0.311***	0.313***	0.314***	0.039***	0.038***	0.037***	0.039***	0.033***
	(45.14)	(46.08)	(45.99)	(45.21)	(45.95)	(3.26)	(3.22)	(3.08)	(3.25)	(2.65)
ifrs	-0.081***	-0.082***	-0.083***	-0.081***	-0.082***	0.012*	0.013*	0.011	0.013*	0.020***
	(-18.76)	(-19.09)	(-19.00)	(-18.72)	(-18.60)	(1.81)	(1.89)	(1.62)	(1.91)	(2.96)

	Capital Asset Pricing model (CAPM)					Industry Adjusted Earning to Price Ratio model (INDEP)				
	CAPM	CAPM	CAPM	CAPM	CAPM	INDEP	INDEP	INDEP	INDEP	INDEP
	(Model 1)	(Model 2)	(Model 3)	(Model 4)	(Model 5)	(Model 6)	(Model 7)	(Model 8)	(Model 9)	(Model 10)
Year dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Sector dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Cons	0.151***	0.141***	0.143***	0.152***	0.154***	0.028	0.041	0.041	0.032	0.028
	(6.16)	(5.75)	(5.82)	(6.31)	(6.28)	(0.54)	(0.84)	(0.81)	(0.65)	(0.52)
Number of observations (N)	2286	2287	2287	2288	2304	1173	1173	1173	1173	1173

t statistics in parentheses

* p<0.10 ** p<0.05 *** p<0.01

Note: All variables are as previously defined in Table 1

The control variables, ROA, LEV, CFO, BETA, and IFRS have a significant positive relationship with the COE (INDEP). However, BTM and Big-N (BIG4) have a significant negative relationship with the COE (INDEP). In conclusion, it could be argued that the quality of CG affects the company's COE by constraining the self-serving tendencies of managers, maximising shareholders' wealth and increasing the value of the companies.

Conclusion

This paper provides the results of the empirical analysis, including descriptive statistics, pairwise correlation and regression analyses, relating to the effect of earnings management and corporate governance on the cost of equity capital in Thai listed companies for the period 2003-2010. For the regression analysis, this paper presents the results of two main objectives of this study: (1) the influence of earnings management on the cost of equity capital, and (2) the influence of corporate governance on the cost of equity capital. The first main finding is that, in general, cost of equity capital is positively associated with earnings management. These results support the argument that, since earnings management practice creates information risk for investors and reduces the quality of financial information, investors will expect a high price to protect themselves from uncertainty on their investment; this, ultimately, increases the company's cost of equity capital. The second main finding is the influence of corporate governance on the cost of equity capital. Seven out of eight corporate governance variables are found to be associated with the cost of equity capital. The direction of the relationship depends on the variable. For example, on the one hand, the results suggest that a higher proportion of board interlocking, board independence, and audit committee expertise are negatively associated with the cost of equity. On the other hand, CEO-duality, audit opinion, managerial ownership and institutional shareholders are positively associated with the cost of equity capital. These findings are consistent with agency theory expectations and most research on this topic.

References

- Ahmad-Zaluki, N. A., Campbell, K., & Goodacre, A. (2011). Earnings management in Malaysian IPOs: The East Asian crisis, ownership control, and post-IPO performance. *International Journal of Accounting*, 46(2), 111-137.
- Armstrong, C. S., Core, J. E., Taylor, D. J., & Verrecchia, R. E. (2011). When Does Information Asymmetry Affect the Cost of Capital? *Journal of Accounting Research*, 49(1), 1-40.
- Armstrong, C. S., Larcker, D. F., Ormazabal, G., & Taylor, D. J. (2013). The relation between equity incentives and misreporting: The role of risk-taking incentives. *Journal of Financial Economics*, 109(2), 327-350.
- Ashton, D. (1995). The cost of equity capital and a generalisation of the dividend growth model. *Accounting and business research*, 26(1), 3-17.
- Banz, R. W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics*, 9(1), 3-18.
- Basu, S. (1977). Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis. *The Journal of Finance* 32(3), 663-682.
- Becker-Blease, J. R., & Irani, A. J. (2008). Do corporate governance attributes affect adverse selection costs? Evidence from seasoned equity offerings. *Review of Quantitative Finance and Accounting*, 30(3), 281-296.
- Bedard, J., Chtourou, S. M., & Courteau, L. (2004a). The effect of audit committee expertise, independence, and activity on aggressive earnings management. *Auditing: A Journal of Practice & Theory*, 23(2), 13-35.
- Bedard, J., Chtourou, S. M., & Courteau, L. (2004b). The Effect of audit committee expertise, Independence, and Activity on Aggressive Earnings management *Auditing: A Journal of Practice & Theory* (Vol. 23, pp. 13-35).

- Bedard, J. C., & Johnstone, K. M. (2004). Earnings manipulation risk, corporate governance risk, and auditors' planning and pricing decisions. *Accounting Review*, 79(2), 277-304.
- Bhandari, L. C. (1988). Debt/equity ratio and expected common stock returns: Empirical evidence. *The Journal of Finance* 43(2), 507-528.
- Bhattacharya, U., Daouk, H., & Welker, M. (2003). The world price of earnings opacity. *The accounting review*, 78(3), 641-678.
- Black, F. (1972). Capital market equilibrium with restricted borrowing. *The Journal of Business*, 45(3), 444-455.
- Botosan, C., Plumlee, M., & Xie, Y. (2004). The role of information precision in determining the cost of equity capital. *Review of Accounting Studies*, 9(2-3), 233-259.
- Boyd, B. K. (1994). Board control and CEO compensation. *Strategic Management Journal*, 15, 335-344.
- Chen, H., Chen, J. Z., Lobo, G., & Wang, Y. (2011). Effects of Audit Quality on Earnings Management and Cost of Equity Capital: Evidence from China. *Contemporary Accounting Research*, 28(3), 892-925.
- Chen, K. Y., Lin, K.-L., & Zhou, J. (2005). Audit quality and earnings management for Taiwan IPO firms. *Managerial Auditing Journal*, 20(1), 86-104.
- Cheng, C. A., Collins, D., & Huang, H. H. (2006). Shareholder rights, financial disclosure and the cost of equity capital. *Review of Quantitative Finance and Accounting*, 27(2), 175-204.
- Cornett, M. M., Marcus, A. J., & Tehranian, H. (2008). Corporate governance and pay-for-performance: The impact of earnings management. *Journal of Financial Economics*, 87(2), 357-373.
- Da, Z., Guo, R.-J., & Jagannathan, R. (2012). CAPM for estimating the cost of equity capital: Interpreting the empirical evidence. *Journal of Financial Economics*, 103(1), 204-220.
- Dao, M., Huang, H. W., & Zhu, J. (2012). The effects of audit committee members' age and additional directorships on the cost of equity capital in the usa. *European Accounting Review*.
- Davidson, R., Goodwin-Stewart, J., & Kent, P. (2005a). Internal governance structures and earnings management. *Accounting and Finance*, 45, 241-267.
- Davidson, R., Goodwin-Stewart, J., & Kent, P. (2005b). Internal governance structures and earnings management. *Accounting and Finance*, 45(2), 241-267.
- DeAngelo, L. E. (1988). Managerial competition, information costs, and corporate governance. The use of accounting performance measures in proxy contests. *Journal of Accounting and Economics*, 10(1), 3-36.
- Dechow, P. M. (1994). Accounting earnings and cash flows as measures of firm performance The role of accounting accruals. *Journal of accounting and economics*, 18, 3-42.
- Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *Accounting Review*, 193-225.
- Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1996). Causes and consequences of earnings manipulation: An analysis of firms subject to enforcement actions by the SEC. *Contemporary Accounting Research*, 13(1), 1-36.
- Easton, P. D. (2004). PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital. *The accounting review*, 79(1), 73-95.
- Elton, E. J. (1999). Expected return, Realized return, and Asset pricing tests. *The Journal of Finance*, 54(4), 1199-1220.
- Fama, E. F., & French, K. R. (1992). The cross-section of expected stock returns. *The Journal of Finance* 47(2), 427-465.
- Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3-56.
- Fama, E. F., & French, K. R. (1996). The CAPM is wanted, dead or alive. *The Journal of finance*, 51(5), 1947-1958.
- Fama, E. F., & French, K. R. (2004). The capital asset pricing model: theory and evidence. *The Journal of Economic Perspectives*, 18(3), 25-46.
- Fama, E. F., & Jensen, M. C. (1983). Separation of Ownership and Control. *Journal of Law and Economics*, 26(2), 301-325.
- Forster, N. (2003). The FASB and the Capital Market. Retrieved 9 July, 2013, from http://www.fasb.org/articles&reports/Foster_FASBReport.pdf
- Francis, J., LaFond, R., Olsson, P., & Schipper, K. (2005). The market pricing of accruals quality. *Journal of accounting and economics*, 39(2), 295-327.
- Gebhardt, W. R., Lee, C., & Swaminathan, B. (2001). Toward an implied cost of capital. *Journal of Accounting Research*, 39(1), 135-176.
- Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, 60(2), 187-243.
- Gray, P., Koh, P. S., & Tong, Y. H. (2009). Accruals quality, information risk and cost of capital: Evidence from Australia. *Journal of Business Finance and Accounting*, 36(1-2), 51-72.

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- Harris, R. S., Marston, F. C., Mishra, D. R., & O'Brien, T. J. (2003). Ex ante cost of equity estimates of S&P 500 firms: The choice between global and domestic CAPM. *Financial Management*, 51-66.
- Hashim, H. A., & Devi, S. S. (2008). Corporate governance, ownership structure and earnings quality: Malaysian evidence. *Unpublished manuscript*, 1-22.
- Healy, P. M. (1984). The effect of bonus schemes on Accounting decisions. *Working paper*, 1-94.
- Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons*, 13(4), 365-383.
- Hermalin, B. E., & Weisbach, M. S. (2010). Information Disclosure and Corporate Governance. *Working paper*, 17, 1-43.
- Hribar, P., & Jenkins, N. T. (2004). The effect of accounting restatements on earnings revisions and the estimated cost of capital. *Review of Accounting Studies*, 9(2-3), 337-356.
- Huang, H., Wang, Q., & Zhang, X. (2009). The effect of CEO ownership and shareholder rights on cost of equity capital. *Corporate Governance*, 9(3), 255-270.
- Huang, H. H., Wang, W., & Zhou, J. (2013). Shareholder Rights, Insider Ownership and Earnings Management. *Abacus*, 49(1), 46-73.
- Jagannathan, R., & Meier, I. (2002). *Do we need CAPM for capital budgeting?* National Bureau of Economic Research.
- Jaggi, B., Leung, S., & Gul, F. (2009). Family control, board independence and earnings management: Evidence based on Hong Kong firms. *Journal of Accounting and Public Policy*, 28(4), 281-300.
- Jans, M., Orens, R., & Lybaert, N. (2007). The Relation between Disclosure Quality, Income Smoothing and Earnings' Timeliness. *Unpublished manuscript*, 1-16.
- Jeter, D. C., & Shivakumar, L. (1999). Cross-sectional estimation of abnormal accruals using quarterly and annual data: Effectiveness in detecting event-specific earnings management. *Accounting and business research*, 29(4), 299-319.
- Jiang, W., & Anandarajan, A. (2009). Shareholder rights, corporate governance and earnings quality: The influence of institutional investors. *Managerial Auditing Journal*, 24(8), 767-791.
- Jo, H., & Kim, Y. (2007). Disclosure frequency and earnings management. *Journal of Financial Economics*, 84, 561-590.
- Jones, J. (1991). Earnings Management During Import Relief Investigations. *Journal of Accounting Research*, 29(2), 193-228.
- Jones, K., Krishnan, G., & Melendrez, K. (2008). Do Models of Discretionary Accruals Detect Actual Cases of Fraudulent and Restated Earnings? An Empirical Analysis. *Contemporary Accounting Research*, 25(2), 499-531.
- Kasznik, R. (1999). On the Association between Voluntary Disclosure and Earnings Management. *Journal of Accounting Research*, 37(1), 57-81.
- Kasznik, R. (2004). Discussion of "the effect of accounting restatements on earnings revisions and the estimated cost of capital". *Review of Accounting Studies*, 9(2-3), 357-367.
- Kielholz, W. (2000). The cost of capital for insurance companies.
- Kim, J.-B., & Sohn, B. C. (2013). Real Earnings Management and Cost of Capital. *Journal of Accounting and Public Policy*, *Forthcoming*.
- King, M. (2009). The cost of equity for global banks: a CAPM perspective from 1990 to 2009. *BIS Quarterly Review*, *September*.
- Klein, A. (2002a). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33(3), 375-400.
- Klein, A. (2002b). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33, 375-400.
- Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of accounting and economics*, 39, 163-197.
- Kubota, K., Suda, K., & Takehara, H. (2010). Dissemination of Accruals Information, Role of Semi-Annual Reporting, and Analysts' Earnings Forecasts: Evidence from Japan. *Journal of International Financial Management & Accounting*, 21(2), 120-160.
- Larcker, D. F., & Richardson, S. A. (2004). Fees paid to audit firms, accrual choices, and corporate governance. *Journal of Accounting Research*, 42(3), 625-658.
- Lee, K. W., Lev, B., & Yeo, G. (2007). Organizational structure and earnings management. *Journal of Accounting, Auditing and Finance*, 22(2), 293-331.
- Levitt, A. (1997). *"The Importance of High Quality Accounting Standards" Remarks by Arthur Levitt*. Inter-American Development Bank, September 29, 1997.
- Li, G. (2005). Information quality, learning, and stock market returns. *Journal of Financial and Quantitative Analysis*, 40(3), 595-620.

- Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *The review of economics and statistics*, 47(1), 13-37.
- Mazzotta, R., & Veltri, S. (2012). The relationship between corporate governance and the cost of equity capital: Evidence from the Italian stock exchange. *Journal of Management and Governance*, 1-30.
- Osma, B. G., & Noguer, B. G. D. A. (2007). The effect of the board composition and its monitoring committees on earnings management: Evidence from Spain. *Corporate Governance*, 15(6), 1413-1428.
- Park, Y. W., & Shin, H.-H. (2004). Board composition and earnings management in Canada. *Journal of Corporate Finance*, 10, 431-457.
- Poshakwale, S., & Courtis, J. K. (2005). Disclosure level and cost of equity capital: evidence from the banking industry. *Managerial and Decision Economics*, 26(7), 431-444.
- Ramly, Z., & Rashid, H. M. A. (2010). Critical review of literature on corporate governance and the cost of capital: The value creation perspective. *Affrican Journal of Business Management*, 4(11), 2198-2204.
- Regalli, M., & Soana, M.-G. (2012). Corporate Governance Quality and Cost of Equity in Financial Companies. *International Journal of Business Administration*, 3(2), 2-16.
- Reverte, C. (2009). Do better governed firms enjoy a lower cost of equity capital?: Evidence from Spanish firms. *Corporate Governance*, 9(2), 133-145.
- Rosenberg, B., Reid, K., & Lanstein, R. (1985). Persuasive evidence of market inefficiency. *The Journal of Portfolio Management*, 11(3), 9-16.
- Saleh, N. M., & Ahmed, K. (2005). Earnings management of distressed firms during debt renegotiation. *Accounting and business research*, 35(1), 69-86.
- Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *The Journal of finance*, 19(3), 425-442.
- Shuto, A. (2007). Executive compensation and earnings management: Empirical evidence from Japan. *Journal of International Accounting, Auditing and Taxation*, 16(1), 1-26.
- Strobl, G. (2013). Earnings Manipulation and the Cost of Capital. *Journal of Accounting Research*, 51(2), 443-479.
- Sun, L., & Rath, S. (2009). An Empirical Analysis of Earnings Management in Australia. *International Journal of business, Economics, Finance and Management Sciences*, 1(2), 150-166.
- Teoh, S. H., Welch, I., & Wong, T. J. (1998). Earnings management and the long-run market performance of initial public offerings. *The Journal of Finance*, 53(6), 1935-1974.
- Teshima, N., & Shuto, A. (2008). Managerial ownership and earnings management: Theory and empirical evidence from Japan. *Journal of international financial Management and Accounting*, 19(2), 107-132.
- Upadhyay, A., & Sriram, R. (2011). Board size, corporate information environment and cost of capital. *Journal of Business Finance and Accounting*, 38(9-10), 1238-1261.
- Welch, I. (2008). The consensus estimate for the equity premium by academic financial economists in December 2007. Available at SSRN 1084918.
- Williams, M. (2004). Discussion of "the role of information precision in determining cost of equity capital". *Review of Accounting Studies*, 9(2-3), 261-264.

PROBABILITY OF DEFAULT IN CORPORATE ECONOMIC DISTRESS, OR WHAT RISK DOES MARKET REWARD?

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Abstract: *The article suggests a quantitative model describing development of a corporate economic distress when a firm is not burdened with a long-term debt yet. The model introduces new variables related to the crisis dynamics, market trend and volatility, and corporate features. For the economic distress left unattended and for the recovery stage when the firm tries to restore its stability, the probability of default as a function of time and problem parameters is given, and the distance to default and the point of no return for launching a recovery program are estimated. The model helps select the program minimizing the probability of default over a set of available recovery programs. For a steady developing corporation, it is estimated how much money can be withdrawn from the business for dividend payments and other needs without exposing the corporation to an extra risk of default. In the approximation of firms having no long-term debt, the model demonstrates the limits of validity of the Capital Assets Pricing Model. (JEL G30)*

Keywords: *Corporate Economic Distress; Recovery Program; Probability of Default; Distance to Default; Sustainable Corporate Development; CAPM*

Introduction

In this paper we consider development of a corporate economic distress which is usually the first stage of a more general and dangerous phenomenon of the financial distress (see, for example, Altman & Hotchkiss (2006), Asquith, Gertner, et.al. (1994), Bibeault (1982), Gordon (1971), Wruck (1990)). Following Gorbenko & Strebulaev (2010), we interpret the corporate distress as a permanent shock generated by an external/internal corporate event and setting a long-term adverse factor in a corporate business environment that makes the corporate return on assets (ROA) decrease over time. In a volatile business environment, the first stage of a crisis develops imperceptibly for the company during an incubation period making the company lose precious time. If the corporation fails to identify the problem and find an adequate response to it, the company sustains ever-increasing losses whose cumulative effect threatens a corporate market position and can lead to default. A good recovery plan launched promptly and implemented strictly to the schedule minimizes possible damages and has a good chance to restore corporate stability. The question is *what characteristics the recovery plan must have to be good, and how they are related to parameters of the corporate business environment.*

Crisis management focuses on the following issues:

1. *Crisis recognition*, i.e. registration of a mismatch between a current corporate strategy and a new environment trend germinated by external/internal events. Weak signals of the newborn crisis are concealed by fluctuations in the corporate environment; so, a company must have an early diagnostics procedure for detecting those signals as soon as possible.
2. *Crisis identification*. The management team reviews the company's business to diagnose the crisis, localize its causes, study their mechanisms, and estimate possible threats and opportunities (Pearson & Claire, 1998).
3. *Development and implementation of a recovery program*. Any recovery program must meet specific challenges of a particular business and industry pattern, and, therefore, cannot be comprehensively described here. However, all programs have the following in common. The objective of a recovery program is getting a crisis under control with a minimal loss and probability of default. Decision-making occurs under pressure of losses, uncertainty, and time deficit. Because of the uncertainty, only probabilistic estimations of a corporate development are possible. Any recovery program starts with a delay about the crisis onset and has some efficiency in restoring corporate ROA. For a set of recovery programs available, the team selects the best one and takes steps to its implementation such as fundraising, making necessary organizational and operational preparations, etc. When ready, the corporate team starts implementation of the chosen plan trying to restore a safe business position.
4. *Post-crisis management*. If the company succeeds, the new strategy outlined in the crisis gets further development carrying the changes in organizational values, mission, structure, policies, business processes to their logical conclusions. We share the Roux-Dufort's position (2007) that this holistic approach can create a company's new strategic position in the market increasing its long-term survivability.

In a crisis the corporate team meets a challenge: they must solve the problem which is quite new and maybe even ill-structured in the current paradigm, and they must do it fast. But how fast the corporate reaction must be, and how parameters of the company, business environment, crisis, and recovery program affect the probability of survival the crisis, these questions still wait for their answers. This paper tries to answer them.

For more than fifty years of intensive study of financial distress, a lot of techniques have been developed predicting corporate default based on the multivariate discriminant analysis (Altman, 1968), logit and probit analysis (Asquith, Gertner, et.al., 1994), cumulative sums methodology (Kahya & Theodossiou, 1999)), neural networks (Salchenberger, Cinar, et.al., 1992), genetic algorithms (Shin & Lee, 2002) and some others. All those methods belong to a set of classifying algorithms seeking for time-independent criteria for attributing a firm under consideration to a cluster of healthy firms or to a cluster of distressed ones. They do not consider dynamics of a corporate crisis and efforts the company undertakes to survive it. Therefore, these methods cannot calculate the probability of default as a function of time and industry, company, crisis, and recovery program parameters.

Structural models estimating the probability of corporate default as a function of time from the creditor's point of view are considered in many papers starting with the Merton's seminal work (1974) (e.g. Black & Cox (1976), Geske (1977), Lando (1998)). All those structural models use the option pricing model developed by Black & Scholes (1972) and consider development of a default at a financially distressed firm as a Markov process (a process without prehistory). Financially distressed companies, however, do have a prehistory due to their accumulated long-

term debt. Therefore, strictly speaking, structural models describe the development of default of economically distressed firms having no long-term debt. The main difference of this paper from “the creditor’s approach” to the problem of corporate default is that it considers a corporate distress from the inside using information which help the team not only estimate the distance to default, but also choose a recovery program providing for the highest probability of survival among all available programs.

Outecheva (2007) determines a corporate default as an event occurring when (i) a company fails to meet its financial obligations, (ii) a company files bankruptcy, (iii) an exchange is distressed. This paper considers just the first two cases when a company becomes unable to pay its obligatory payments, or files bankruptcy.

The following analysis is based on the assumptions:

- A1) corporate ROA changes uniformly in a crisis
- A2) market fluctuations are normally distributed, time-invariant, and delta-correlated with slowly changing (constant at the interval of the distress development) parameters
- A3) a rate of corporate obligatory payments is a piecewise constant function.

Assumption (A1) reflects our approximate description of a crisis. Of course, decrease in corporate ROA can vary during the crisis making corporate managers adjust a chosen recovery program to changing conditions. So, an anti-crisis program is not a one-time act, but a controlling procedure reacting to the signals coming from the corporate business environment. Assumptions (A2) and (A3) are discussed in Section 1.

The remainder part of the paper is organized as follows. Section 1 describes the model, considers development of corporate economic distress left unattended up to the moment of default, and estimates the distance to default. Section 2 contains an analysis of a corporate recovery in a distress and estimates the probability of default during the recovery, the point of no return, and the maximum tolerable delay for a recovery program securing a given recovery rate of corporate ROA. Section 3 considers conditions for a steady corporate development and estimates the effect of taxes and a dividend policy on corporate long-term survival. Section 4 estimates the limits for changes in market risks and ROA that generate more free (unbounded) money for company needs and dividend payments. The last section contains a brief discussion of results and conclusions.

Model Description

A corporate strategy includes many components: strategic, financial, and organizational managements, marketing, etc. Its success results in a steady increase of corporate assets over a long-term period. For continuous time, asset dynamics $x(t)$ can be symbolically presented by the model:

$$\frac{dx}{dt} = [r(t) + n_0(t)]x - p(t), \quad x(0) = x_0. \quad (1.1)$$

Function $r(t)$ is corporate return on assets (ROA) at time t , $p(t)$ is a rate of corporate obligatory payments at time t including fixed operating costs, long-term debts, R&D expenditures, marketing expenses, and all kinds of overheads like non-profile assets, etc. We suppose $p(t)$ to be a piecewise constant function:

$$p(t) = \begin{cases} p_0, & 0 \leq t < t_1, \\ p_1, & t_1 \leq t < t_2, \\ \dots & \\ p_i, & t_i \leq t < t_{i+1}, \\ \dots & \end{cases} \quad (1.2)$$

here p_i is a rate of corporate obligatory payment at interval $[t_i, t_{i+1})$. So, a company's state at this interval is affected by continuing debt payments, investments into R & D projects, and also current obligatory payments like fixed costs. Term $n_0(t)$ shows an effect of market fluctuations on corporate assets; it is supposed to be a normal random process with the properties:

$$(A2a) \langle n_0(t) \rangle = m;$$

$$(A2b) n_0(t) \text{ is time-invariant and delta-correlated: } \langle [n_0(t_1) - m][n_0(t_2) - m] \rangle = C \delta(t_1 - t_2),$$

$$\delta(t - t_0) = \begin{cases} \infty, & t = t_0, \\ 0, & t \neq t_0 \end{cases}, \text{ and } \int_{t_0 - \varepsilon}^{t_0 + \varepsilon} \delta(t - t_0) dt = 1 \text{ for any } \varepsilon > 0.$$

Constant C is a measure of the effect that market fluctuations make on corporate assets. Parameter C reflects a balance between the fluctuations intensity and the company's capability to run her business in rough conditions limiting an adverse effect of market fluctuations on corporate assets. Operator $\langle \cdot \rangle$ denotes averaging over $n_0(t)$ at time t . Assumption (A2b) means that a great number of non-correlated random fluctuations occur in a characteristic period of ROA change. Assumption (A2a) actually reflects the effect that the market exercises on any company. Process $n_0(t)$ includes all random market impacts on a company, both diversifiable (unique risks) and non-diversifiable ones (market risks). The market risks contain a drift with the market that means the presence of a non-zero regular component in $n_0(t)$ for time periods: $m < 0$ for recessive markets, $m = 0$ for stagnating markets, and $m > 0$ for raising markets.

With a process $n(t)$: $n_0(t) = n(t) + m$ which is normal, time-invariant, delta-correlated, and has a zero mean, equation (1.1) becomes

$$\frac{dx}{dt} = [r(t) + m + n(t)]x - p(t), \quad x(0) = x_0, \quad (1.3)$$

which can be rewritten as the geometric Brownian model

$$dx = [r_0(t)x - p(t)]dt + \sqrt{C}x\delta W, \quad x(0) = x_0, \quad r_0(t) = r(t) + m, \quad (1.4)$$

where W is a Wiener process. For the last stochastic equation one can write a Fokker - Planck equation for the probability distribution $f(x, t)$

$$\frac{\partial f}{\partial t} + \frac{\partial}{\partial x}[(r_0(t)x - p)f] - \frac{1}{2} \frac{\partial^2}{\partial x^2}(Cx^2 f) = 0. \quad (1.5)$$

Introducing a new function V and a new variable z

$$V = xf(x, t), \quad z = \ln x, \quad (1.6)$$

the equation (1.5) becomes

$$\frac{\partial V}{\partial t} + r_1(t) \frac{\partial V}{\partial z} - \frac{C}{2} \frac{\partial^2 V}{\partial z^2} + pe^{-z} \left(V - \frac{\partial V}{\partial z} \right) = 0, \quad r_1(t) = r(t) + m - C/2 \quad (1.7)$$

In this paper we consider the marginal case of $p = 0$, described by the equation

$$\frac{\partial W}{\partial t} + r_1(t) \frac{\partial W}{\partial z} - \frac{C}{2} \frac{\partial^2 W}{\partial z^2} = 0 \quad (1.8)$$

with the initial condition

$$W(z, 0) = \frac{1}{\sqrt{2\pi\sigma_0^2}} \exp\left\{-\frac{(z - H_0)^2}{2\sigma_0^2}\right\}, \quad H_0 = \langle z \rangle|_{t=0}. \quad (1.8a)$$

This problem has a solution

$$W(z, t) = \frac{1}{\sqrt{2\pi(\sigma_0^2 + Ct)}} \exp\left\{-\frac{(z - H(t))^2}{2(\sigma_0^2 + Ct)}\right\}, \quad (1.9a)$$

$$H(t) = H_0 + \int_0^t r_1(\tau) d\tau \quad (1.9b)$$

which is a normal distribution parametrically depending on time. Equation (1.9b) shows an evolution of the distribution center (the distribution mean) over time. One can see from (1.7) that function $V(z, t)$ deviates from the normal distribution the more the larger parameter p . Solution (1.9) supposes that corporate assets can assume any value from zero to infinity. However, there is a minimal value $x_{\min} > 0$, $DL = \ln x_{\min}$, at which default occurs. For a small business (a proprietorship), x_{\min} is an asset value at which the proprietors stop their struggle for the firm survival and file bankruptcy trying to confine damages to their personal property. For a public firm, x_{\min} is a level at which a noteworthy part of corporate shareholders panicking sells their shares out in a short time interval making the share price drop sharp. Even if that drop does not lead to a corporate default immediately, the problem of corporate survival must be restated for the new (obviously worse) conditions. Observe that x_{\min} depends on both objective factors (a value of

the accumulated debt, the rate of the assets decrease, etc.) and subjective factors (the management averse to risk, shareholders' confidence in the corporate team, etc.). Subjective factors add more ambiguity to the problem of corporate survival.

For the problem (P1) described by equation (1.8) with the boundary conditions

1. There is an absorbing screen at the default line : $W(DL, t) = 0$
 2. $W(z, t)$ decays fast enough as z tends to infinity: $W(\infty, t) = 0$
- and the initial condition meeting the boundary conditions

$$W(z, 0) = \frac{1}{\sqrt{2\pi\sigma_0^2}} \left\{ \exp\left[-\frac{(z - H_0)^2}{2\sigma_0^2}\right] - \exp\left[-\frac{(-2DL + z + H_0)^2}{2\sigma_0^2}\right] \right\}, \quad (1.8b)$$

a solution is

$$W(z, t) = \frac{1}{\sqrt{2\pi(\sigma_0^2 + Ct)}} \left\{ \exp\left[-\frac{(z - H(t))^2}{2(\sigma_0^2 + Ct)}\right] - \exp\left[-\frac{(-2DL + z + H(t))^2}{2(\sigma_0^2 + Ct)}\right] \right\}. \quad (1.9)$$

The physical meaning of the absorbing screen becomes clear if one considers Brownian particles whose concentration is proportional to $W(z, t)$ travelling in the semi-space of $[DL, \infty)$. When a particle touches the screen, it sticks to the screen (the particle “perishes”). To see the financial meaning of that screen, let us find the intensity of the probability to perish for the particles with the probability distributions determined by the problem (P1):

$$P_D[H(t)] = 2 \int_0^{x_{\min}} \frac{dx}{x\sqrt{2\pi(\sigma_0^2 + Ct)}} \exp\left[-\frac{(\ln x - H(t))^2}{2(\sigma_0^2 + Ct)}\right] = 2\Phi\left(-\frac{H(t) - DL}{\sqrt{\sigma_0^2 + Ct}}\right), \quad (1.10a)$$

$$DL = \ln x_{\min}, \quad \Phi(z) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^z \exp(-t^2/2) dt. \quad (1.10b)$$

At the screen $H(t) = DL$, and the intensity of the particle's probability to perish is $P_D(DL) = 1$. The case when the mean logarithm of assets hit DL -line, we call the *hard default*. The other case when a default occurs because of fluctuations while the mean logarithm of assets stays over DL -line, we call the *soft default*. The probability of the soft default, PRD , as the assets decline is determined as

$$PRD(t) = \int_0^t P_D[H(t')] dt'. \quad (1.11)$$

Suppose that a corporation develops with a constant ROA:

$$r_1(t) \equiv R_1 = R + m - C/2, \quad (1.12)$$

and average corporate assets grow exponentially over time. Here R_1 is observable corporate ROA in current market conditions, and R is unobservable ROA in “sterile” conditions with $m = 0$, $C = 0$.

Let a crisis onset at moment T_A and since that time the mean corporate ROA uniformly decreases over time:

$$r_1(t) = R_1 - wt, \quad (1.13)$$

where w is a rate of ROA decrease caused by the crisis (Fig. 1). Values T_A and w can be determined using corporate statistics collected due to monitoring of corporate assets. Positive asset dynamics together with an effective asset structure determine a corporate long-term stability. If the asset structure is not optimal for a current business conditions, in other words some assets cannot be used, one must use in the analysis effective assets $x_{eff} = \alpha x(t)$, $\alpha < 1$.

From the equation $P_D(t) = 1$, time T_{Ch} when the mean logarithm of assets hits DL -line (the distance to the hard default) is

$$T_{Ch} = T_B + \sqrt{2(H_B - DL)/w}, \quad (1.14a)$$

$$T_B = R_1 / w, \quad H_B = H(T_B) = H_A + wT_B^2 / 2. \quad (1.14b)$$

T_B is the moment when corporate assets becomes maximum, and H_B is the highest point in the trajectory of corporate decline.

The distance to a soft default is given by the equation

$$\Delta T^2 = (2/w)[H_B - DL - \alpha_p(\sigma_0^2 + CT_B + C\Delta T)^{1/2}], \quad (1.15.a)$$

$$T_{Cs}(p_0) = T_B + \Delta T, \quad \alpha_p = -\Phi^{-1}(p_0/2) > 0, \quad (1.15.b)$$

where p_0 is a given intensity of default considered as dangerous. The equation can be solved numerically using iterative procedure starting with $\Delta T^0 = 0$ in the right part of the equation. As one can easily see, $T_{Cs}(p_0) < T_{Ch}$ and tends to T_{Ch} , as $p_0 \rightarrow 1$.

Corporate recovery

Let a recovery program be launched at time T_1 raising corporate ROA at rate u . At T_1 , the recovery initial conditions are:

$$\begin{aligned} r_1(T_1) &= -w(T_1 - T_B), \\ H_1 &= H(T_1) = H_A + wT_B T_1 - wT_1^2 / 2 = H_B - w(T_1 - T_B)^2 / 2, \\ \sigma_1^2 &= \sigma_0^2 + CT_1. \end{aligned} \quad (2.1)$$

So, for t measured from T_1 , we have in the recovery

$$\begin{aligned} r_2(t) &= ut - w(T_1 - T_B), \\ H(t) &= H_1 - w(T_1 - T_B)t + ut^2 / 2 \equiv H_2(t), \end{aligned} \quad (2.2)$$

$$H(t) = \begin{cases} H_1(t) = H_A + wT_B t - wt^2 / 2, & 0 \leq t \leq T_1 \\ H_2(t') = H_1 - w(T_1 - T_B)t' + ut'^2 / 2, & t' = t - T_1, t > T_1 \end{cases}$$

If $T_1 > T_B$, a critical point exists in the recovery trajectory in which a mean logarithm of corporate assets is minimal:

$$T_{cr} = (w/u)(T_1 - T_B), \quad H_{cr} = H_1 - (w^2 / 2u)(T_1 - T_B)^2 = H_1 - uT_{cr}^2 / 2. \quad (2.3)$$

The intensity of the probability of default in the recovery when a mean logarithm of assets is $H(t)$ can be computed as

$$P_D(H) = 2\Phi \left[-\frac{H(t) - DL}{\sqrt{\sigma_1^2 + Ct}} \right], \quad (2.4)$$

and the probability of corporate default is determined by the integral

$$PRD(t; T_1, H_1, u) = \int_{T_1}^t P_D[H(t')] dt'. \quad (2.5)$$

It becomes clear from (2.2), (2.4) and (2.5) that the main contribution to the probability of soft default is made by the part of the recovery trajectory closest to the critical point where the intensity of the probability of default is high and the vertical velocity is low; the time that the mean logarithm of assets spends in the dangerous area depends inversely on recovery rate u .

If the objective of the recovery program is to restore the pre-crisis ROA: $r_2(T_r) = R_1$, then one can find the recovery time T_r and mean logarithm of assets H_r as

$$T_r = (w/u)T_1, \quad H_r = H_1 + (w^2/2u)(2T_B - T_1)T_1 \quad (2.6)$$

For $T_1 > 2T_B$, however, $H_r < H_1$. If H_r is too close to DL -line, and the intensity of the default probability remains intolerably high then the objective of the recovery can be redefined as to achieve a safe state where the intensity of the probability of corporate default is less than a predetermined value p_0 .

Now recovery time T_r is determined by the equations

$$T_r = T_{cr} + x, \quad x^2 = (2/u) \left(\alpha_p \sqrt{\sigma_{cr}^2 + Cx} - H_{cr} + DL \right), \quad (2.7a)$$

$$\sigma_{cr}^2 \equiv \sigma_1^2 + CT_{cr}, \quad \Phi^{-1}(p_0/2) \equiv -\alpha_p < 0 \quad (2.7b)$$

here $\Phi^{-1}(\cdot)$ is the inverse function for $\Phi(z)$.

The *marginal delay* with a launch of the recovery program, T_1^{\max} , for which the hard default still occurs, can be found as a time for which the numerator in Eq. (2.4) turns zero at the critical point, that is

$$H_{cr} - DL = 0.$$

This condition has two consequences. For the program with a fixed expected recovery rate u , the marginal delay for its launch $T_1^{\max}(u)$ is

$$T_1^{\max} = T_B + \sqrt{\frac{u}{u+w}} (T_{Ch} - T_B), \quad (2.8)$$

and for any $T_1 < T_1^{\max}$ there is no hard default in the recovery. For the program with a fixed delay T_1 , the minimal rate $u^{\min}(T_1)$ preventing the hard default in the recovery is

$$u^{\min} = w \frac{H_B - H_1}{H_1 - DL}. \quad (2.9)$$

For management purposes, however, it is more practical to know the *maximum tolerable delay* for chosen p_0 for the maximum intensity of the probability of default $T_{1p} \equiv T_1(P_D^{\max} = p_0)$ which is a solution to the equation:

$$T_{1p} = T_B + \Delta T, \quad \alpha_p = -\Phi^{-1}(p_0/2),$$

$$\Delta T^2 = \frac{2u}{w(u+w)} \left(H_B - DL - \alpha_p \sqrt{\sigma_0^2 + \frac{Cw}{u}(T_B + \Delta T)} \right). \quad (2.10)$$

The maximum tolerable delay T_{1p} determines the *timeliness* of the anti-crisis decision for given environment, crisis, corporate, and recovery program's parameters and a chosen intensity of the default probability p_0 ; for any delay $T_1 < T_{1p}$ the maximum intensity of the probability of default remains less than p_0 . In the same way, Eq. (2.10) determines the minimal recovery rate $u_{p_0}(T_1) = u^{\min}(P_D^{\max} = p_0)$ providing a chosen level of the maximum intensity of the probability of corporate default for a given delay T_1 .

The usual corporate reaction to a possible default is to increase corporate assets borrowing money from banks (the small enterprises' tactics) or from the market as large firms do. However, this leads to regular debt payments that is the rate of payments becomes non-zero, $p(t) > 0$. We consider this case in another study.

Conditions for steady corporate progress

Let us return to a firm whose assets increase over time with a constant ROA, R_1 . Because a standard deviation of corporate assets continuously grows over time, a question arises about the conditions providing for a steady corporate development. The intensity of the probability of default for that corporation is

$$P_D(H) = 2\Phi \left[-\frac{H(t) - DL}{\sigma_0 \sqrt{1 + Ct/\sigma_0^2}} \right], \quad H(t) = H_0 + R_1 t, \quad (3.1)$$

where $H_0 = \langle z \rangle|_{t=0}$ and σ_0^2 are the mean logarithm and variance of the logarithm of corporate assets at the initial time. A corporate development is considered as steady one if at any time t the intensity of the probability of default remains less than a chosen p_0 . This requirement is equivalent to

$$1 + \frac{Ct}{\sigma_0^2} - \frac{\alpha_p C}{R_1 \sigma_0} \sqrt{1 + \frac{Ct}{\sigma_0^2}} + \frac{C(H_0 - DL)}{R_1 \sigma_0^2} - 1 > 0, \quad (3.2)$$

and $\alpha_p = -\Phi^{-1}(p_0/2)$. The inequality is true for any t when the following requirement is met:

$$\left(\frac{\alpha_p C}{2\sigma_0 R_1} \right)^2 - \frac{C(H_0 - DL)}{R_1 \sigma_0^2} + 1 < 0. \quad (3.3)$$

So, for ratio $Q = \alpha_p C / (2R_1 \sigma_0)$ providing a steady corporate progress, one gets the interval

$$K^{-1}(ms) < Q < K(ms), \quad (3.4a)$$

$$K(ms) = ms + (ms^2 - 1)^{1/2}, \quad (3.4b)$$

$$ms = \frac{H_0 - DL}{\alpha_p \sigma_0} \geq 1. \quad (3.4c)$$

As one can see in Fig.3, $K(ms)$ (the upper branch) monotonously grows over ms from 1 to infinity, and K^{-1} (the lower branch) tends from one to zero. The condition (3.4c) means that H_0 must be high enough over DL -line, or else a default can occur soon after the start of corporate activities. Thus, variable ms can be interpreted as the *margin of corporate safety*. The right limit in (3.4a) seems very natural: the mean logarithm of corporate assets must rise faster than the standard deviation keeping a low intensity of the probability of default. The left inequality in (3.5a) limits ROA from above. When ROA is high, corporate assets grow fast and asset fluctuations become also high because they are proportional to the assets (see (1.4)). The greater fluctuations need the greater margin of safety, therefore on the lower branch (high ROA) ms increases fast.

Any business is created as a source of income for its proprietors and/or investors, and any firm (not a proprietorship) finishing a year with profits pays taxes. Suppose that a proprietorship has successfully completed its business year staying within the region of stability. As time runs, a position of a steady firm shifts right along ms axis due to accumulated assets (a mean logarithm of corporate assets in the end of the financial year is $H(T)$). How much money can the proprietors take out of their business without taking an extra risk of default in the next business cycle? Figure 3 answers this question.

First, parameter Q is calculated for corporate parameters and a chosen intensity of the probability of default p_0 :

$$Q_0 = \alpha_p C / (R_1 \sigma_0), \quad \alpha_p = -\Phi^{-1}(p_0/2), \quad (3.5)$$

using for the standard deviation σ_0 the value achieved *in the end* of the business year. Then a horizontal line $Q = Q_0$ is drawn in Graph 3 to a point of intersection with curve $K(ms)$, and point $ms^*(Q_0)$ shows the least margin of safety for the next business cycle, that is the minimal initial value of the logarithm of assets guaranteeing the intensity of the probability of default less than p_0 . The amount of money W which the proprietors can withdraw without increasing the risk of default in the next business cycle is

$$\ln W \leq \alpha_p \sigma_0 [ms - ms^*(Q_0)], \quad (3.6)$$

here ms is the margin of safety in the end of the year. We can call W unbounded or free money understanding that this money is not bounded by the requirement of securing the corporate stability.

Now let us consider a public corporation paying taxes and dividends. If after tax corporate assets are less than the least margin of safety for given conditions $ms^*(Q_0)$

$$ms(T) \equiv [\ln[X_F - T(X_F - X_0)] - DL] / (\alpha_p \sigma_0) \quad (3.7a)$$

$$ms(T) < ms^*(Q_0) \quad (3.7b)$$

($X_F - X_0 > 0$ and T are before taxes corporate income and an effective tax rate, $ms(T)$ is the after tax margin of safety), the business is already under an elevated risk in the next cycle, and the investors cannot pay any dividends without increasing the risk of default.

If the after tax margin of safety $ms(T)$ is greater than the least possible margin of safety $ms^*(Q_0)$, the amount of dividends D that can be paid to the investors without increasing the risk of default in the next business cycle is

$$\ln D \leq \alpha_p \sigma_0 [ms(T) - ms^*(Q_0)]. \quad (3.8)$$

Because the assets variance grows linearly over time, the margin of safety increases from year to year reducing the sum that proprietors/investors can withdraw from the business for their needs. Therefore the procedure of “general cleaning” $F(\sigma, t)$ in the organization is necessary on a regular basis (a cyclic procedure) to control its entropy level and bring the asset variance down to about the initial value. The corporate team must do it in parallel with a permanent struggle to keep parameter C as low as possible.

Solving problem (P1) in the next time interval with new initial data, one again gets the probability distribution for corporate assets as a composition of two lognormal distributions

$$f(x, t) = \frac{1}{x\sqrt{2\pi(\sigma_0^2 + Ct)}} \left\{ \exp\left[-\frac{(\ln x - H(t))^2}{2(\sigma_0^2 + Ct)}\right] - \exp\left[-\frac{(-2DL + \ln x + H(t))^2}{2(\sigma_0^2 + Ct)}\right] \right\}. \quad (3.9)$$

In the end of the next business cycle the proprietors repeat one-time money withdrawal from their business observing the conditions of the corporate steady development. The probability distribution will have the same structure (3.9) in a business cycle interval for any number of completed cycles. However, for a time interval much greater than a business cycle, the probability distribution averaged over that interval will deviate from the distribution (3.9). Due to regular money withdrawals, corporate assets spend more time in a region of low values in comparison to the distribution (3.9) swelling the low part of the effective probability distribution. To determine that true probability distribution with heavier tails, one has to consider the case with nonzero payments $p(t) \neq 0$.

What risks does the market reward?

There is a popular statement made within the frames of Capital Asset Pricing Model (CAPM) that “the market rewards market risks” meaning that investors investing in portfolios with higher market risks have higher returns due to increase in prices of their shares and received dividend payments (see, for example, Brealey & Mayers, 1996). Higher portfolio market risks come from higher corporate market risks. Here we try to understand what market risks are rewarded by the market at the corporate level presuming that the considered above sustainable corporate development is effective.

It was shown that dividends are paid from free money which a company earns at the market. So, taking extra market risks must result in the growth of free money. Below we derive requirements which must be met to have more money for dividend payments.

Let at a time t_0 a corporate keep a position (ms_0, Q_0) in the area of corporate sustainable development (Fig. 4). This position is characterized by the minimal permissible margin of safety ms_0^* (see (3.4) for $K = Q_0$) and available free money W_0 ($w_0 = \ln W_0$)

$$ms_0^* = (Q_0^2 + 1) / 2Q_0, \quad (4.1a)$$

$$w_0 / (\alpha_p \sigma_0) = ms_0 - ms_0^* = ms_0 - (Q_0^2 + 1) / (2Q_0). \quad (4.1b)$$

Suppose that at a time t_1 the corporate position has changed to (ms_1, Q_1) with the minimal permissible margin of safety ms_1^* and the available free money W_1 ($w_1 = \ln W_1$). An initial logarithmic variance of corporate assets consists of the market and individual variances: $\sigma_0^2 = \sigma_m^2 + \sigma_i^2$. Let the individual volatility relate to the market volatility as $\sigma_i = a\sigma_m$, then $\sigma_0^2 = \sigma_m^2(1 + a^2)$. When the firm changes its position, its market volatility changes to

$\sigma_m^1 = b\sigma_m^0$, $b \geq 1$. If the ratio $a = \sigma_i / \sigma_m$ remains the same in the transition than $\sigma_1 = b\sigma_0$, and the margin of safety is

$$ms_1 = (H_0 - DL) / (\alpha_p \sigma_1) = ms_0 / b, \quad (4.2a)$$

If that ratio changes to $a_1 = \sigma_i^1 / \sigma_m^1$, than $\sigma_1 = b(1 + a_1^2)^{1/2} (1 + a_0^2)^{-1/2} \sigma_0 \equiv b' \sigma_0$, and the margin of safety becomes

$$ms_1 = (H_0 - DL) / (\alpha_p \sigma_1) = ms_0 / b' \quad (4.2b)$$

$$b' = b(1 + a_1^2)^{1/2} (1 + a_0^2)^{-1/2} \quad (4.2c)$$

Further we consider the case (4.2a) understanding that we can always extend results on the case (4.2b) using correction (4.2c).

The change in Q is caused by changes in volatility, ROA ($R_1^1 = cR_1^0$), and in parameter C which within one industry characterizes an intensity of competition and capability of the corporate team to resist adverse effects of market fluctuations:

$$Q_1 = \alpha_p C / (R_1^1 \sigma_1) = Q_0 / (bc), \quad (4.3a)$$

$$w_1 / (\alpha_p \sigma_0) = b(ms_1 - ms_1^*) = ms_0 - (Q_0^2 + b^2 c^2) / (2Q_0 c). \quad (4.3b)$$

Our goal is to determine conditions for b and c when the corporate position is not worsened by changes of parameters b and c

$$(w_1 - w_0) / (\alpha_p \sigma_0) = (Q_0^2 + 1) / (2Q_0) - (Q_0^2 + b^2 c^2) / (2Q_0 c) \geq 0. \quad (4.4)$$

The last inequality can be rewritten as

$$b^2 c^2 - (Q_0^2 + 1)c + Q_0^2 \leq 0. \quad (4.5)$$

To have a meaningful solution to the inequality (4.5), the following conditions must be met

$$1 \leq b \leq \frac{Q_0^2 + 1}{2Q_0}, \quad (4.6a)$$

$$[ms_0 + (ms_0^2 - 1)^{1/2}]^{-1} \leq Q_0 \leq ms_0 + (ms_0^2 - 1)^{1/2}. \quad (4.6b)$$

Solving inequality (4.5), we derive a condition for c as a function of b

$$\frac{(Q_0^2 + 1)/b^2}{1 + (1 - A^2)^{1/2}} \leq c \leq \frac{Q_0^2 + 1}{b^2} [1 + (1 - A^2)^{1/2}], \quad (4.7a)$$

$$A \equiv 2Q_0b/(Q_0^2 + 1). \quad (4.7c)$$

The graphs for the areas securing improvement in corporate free money are given in Fig. 5 and Fig. 6. From the condition (4.7), it follows immediately that for $Q_0 = 1$ and any $ms_0 > 1$, $b = 1$ and $c = 1$, what means that the position with $Q_0 = 1$ and any $ms_0 > 1$ is the best, and any shift from it reduces available free money.

For other corporate positions, an extra market risk is rewarded only within the limits of one and $Maxb(Q_0, ms_0)$. If for a fixed value of ROA (fixed c) the market volatility goes over the maximum, it makes the available corporate free money to diminish. Using the method, one can numerically estimate a threshold for the risk the firm can take in its specific conditions at which decrease in free money will replace its increase.

But how can a firm raise her ROA? There are two ways. The first is to create a highly profitable market niche protected by patents, know-hows, etc. After that the firm for some time can enjoy high monopolistic prices on her production securing high ROA, moderate C , and low Q value at approximately the same level of the margin of safety ms , thus, generating more free money and creating the possibility to pay higher dividends to her shareholders. The second way is to intrude an existing market niche with ROA higher than an industry's mean ROA. The usual reaction from the niche residents to the intervention is to offer resistance to the intruder implying an intensive competition. It is interesting to note that a competition in this model looks similar to the Japanese Sumo wrestling where two wrestlers try to push each other out from the ring. In the market competition the firms try to push each other out from the area of corporate stability preserving high ROA for the survivors. Intensive competition raises market and individual corporate risks. With temporarily low ROA so characteristic for a bitter commercial struggle, they drive fast all the competitors to the boundary of the region of corporate stability until one or several of them leave the region and stop their struggle for a place in the niche and begin a new struggle for their own survival (see the first two sections of the paper).

So, we see that in general the intensity of competition increases as ROA grows from the top to bottom of the area of sustainable development. Most developing firms cannot afford large margins of safety for any ROA and run their business in the narrow boundary layer of the area of corporate stability from time to time leaving it and returning back. When firms leave the area of corporate stability their probability to default increases and they fill themselves distressed. If they stay outside the area for a longer time and at a longer distance, they may come to default. A

significant share of distressed firms comes from the top of the area of corporate stability where ROA is low. Of course, all these hypotheses need experimental proofs from market observations.

Now we can interpret the graph in the Fig. 6. For a fixed margin of safety, for any position in the upper part of the area of corporate sustainability there is a position in the bottom part of this area conjugated about a position with $Q = 1$. For example, for a corporate position with $Q = 3$, a conjugated position has $Q = 1/3$ and its ROA is nine times higher. Firm assets in that second position grow very fast, but to secure the same margin of safety the firm must keep big bounded resources hardly leaving anything for free money. The firm belongs to “stars” in the terminology of the Business Consulting Group Growth-Share matrix (Henderson, 1970). When the firm’s top management decides that the corporation is big enough, they begin to descend from the area of intensive competition to the areas with lesser ROA and lesser competition (the “star” turns to a “cash cow”). Both for the firms moving to the areas with higher ROA and higher competition, and for the firms moving in the opposite direction, for any change in ROA c there is a maximum reasonable risk $Maxb$ separating the states securing more free money from those for which an amount of free money begins to decrease. In the upper part of the area of stability close to its boundary, one can find “dogs”, and in the middle part of the area one can see the “question marks” in terminology of the BCG matrix.

Fig. 5 and 6 show that increase in the market risk does not always guarantee higher dividend payments as CAPM states, but there is a limit for the market risk getting over which decreases a corporate capability to pay dividends keeping the same margin of safety.

In conclusion we must say that results of this section should be taken with a due caution because they are derived for the case when corporate obligatory payments equal zero: $p(t) = 0$. The CAPM is a heuristic model generalizing market observations, and, therefore, taking into account real cases with $p(t) \neq 0$. A solution of the general problem for the corporate financial distress can give real limits of validity of the CAPM.

The model also explains consequences of use of the trial and error method in crisis management when the corporate team tries to subdue the economic distress blindly experimenting with system parameters. To some extent this way of action is specific for small firms trying to compensate a lack of managerial experience with the trial and error method. As a consequence, the asset variance increases faster for small companies compared to medium and large ones managed by professionals. This relation between the corporation size and the growth rate of the asset variance together with a low margin of safety so usual for small companies explains the higher rate of bankruptcies specific for small companies compared to medium and large ones, especially in hard times when adverse effects of market volatility and a negative economic trend strengthen each other ($R_1 = R + m - C/2$, $m < 0$, C is always positive).

Conclusion

The article suggests a quantitative model of a corporate economic distress studying a corporate crisis which lessens corporate ROA at a fixed statistically estimated rate in a special case when all company assets are used to generate a current cash flow (there is no such payments as fixed costs, long-term debts, R&D expenses, etc.). The company’s environment is described by normally-distributed, time-invariant, and delta-correlated market fluctuations having a measurable intensity C and trend m . The corporate state is identified with assets $x(t)$, their structure and variance σ^2 ,

company's capability to resist adverse effects of market fluctuations C and periodical order-restoring procedure $F(\sigma, t)$. The crisis is characterized by the time of its onset T_A and rate of ROA decrease w . The recovery program is described by its expected rate of ROA raise u and delay T_l about the crisis onset. It is shown how the probability of default develops in time at various stages of the distress depending on the environment, company, crisis, and recovery program parameters.

Maybe the most important result of this study is the proof that development of a corporate economic distress and a corporate struggle for survival are dynamic problems essentially depending on proper timing of all measures. Therefore, there is no time-independent criterion for the distance to default or the probability of default. To some extent this result is equivalent to the Black & Cox's solution (1976), however the entire approach used in the paper shows the limitations of the results. Because $p(t)$ is the corporate expenses which do not generate current cash flow, there is no firm for whom $p(t) = 0$ for a sufficiently long time interval. Therefore this solution has mainly a methodological value.

The model joins financial (assets, ROA, taxes, and dividends) and organizational (an organization's structure, personnel motivation, training, management quality, risk avoidance strategy, etc.) characteristics of a company; the last are integrated in the asset variance σ^2 , its growth rate C , order-restoring procedure $F(\sigma, t)$, and default value x_{\min} . Effects of financial or organizational parameters on a corporate business taken separately are widely discussed in management science (see, for example, Brealey & Myers (2000), Robbins (1990)). The model allows quantitative tracing of the contribution to the probability of default of any extra unit of taxes or dividends, any extra points of corporate ROA, and also of changes in organization's parameters.

Statistically monitoring and analyzing the corporate business one can determine

- ❖ Time of the crisis onset T_A and rate of ROA decrease w caused by the crisis providing for an early crisis detection
 - ❖ variance of corporate assets σ^2 and its growth rate C caused by market fluctuations
 - ❖ trend m in a company industry.
- These parameters help determine
- ❖ mean and confidence interval for the distance to default if the crisis is left unattended
 - ❖ marginal delay $T_1^{\max}(u)$ (the point of no return) for starting a recovery program of estimated efficiency u . The program launched after this time has a very little chance to succeed
 - ❖ recovery time T_r and assets $x(T_r)$ and also critical time T_{cr} for which corporate assets have the minimal value x_{cr}
 - ❖ the probability of corporate default PRD as a function of the recovery plan characteristics and problem's parameters
 - ❖ marginal amount of money that can be withdrawn from the business without exposing it to an extra risk of default.

Measuring corporate, environment, and crisis parameters and estimating characteristics of suggested recovery programs, corporate managers can select for implementation the program providing the highest probability of survival and then estimate its effectiveness in practice. This technique provides managers for the quantitative instrument helping them to improve corporate management in a risky business environment and complex economic conditions. The next step in the development of this model is to increase a model's reality by including nonzero obligatory payments $p(t) > 0$.

References

- Altman, E. I. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *Journal of Finance*, 23, 589 – 609.
- Altman, E., & Hotchkiss, E. (2006). *Corporate Financial Distress and Bankruptcy: Predict and Avoid Bankruptcy, Analyze and Invest in Distressed Debt* (3rd ed.), Hoboken, NJ, USA: John Wiley & Sons.
- Asquith, P., Gertner, R., & Scharfstein, D. (1994). Anatomy of Financial Distress: An Explanation of Junk Bond Issuers. *Quarterly Journal of Economics*, 109, 625 – 658.
- Bibeault, D. (1982). *Corporate Turnaround: How Managers Turn Losers into Winners*. New York, USA: McGraw-Hill.
- Black, F., & Cox, J. C. (1976). Valuing Corporate Securities: Some Effects of Bond Indenture Provisions. *Journal of Finance*, 31, 351 – 367.
- Black, F., & Scholes, M. (1972). The Pricing of Options and Corporate Liabilities. *Journal of Political Economy*, 81(3), 637 – 654.
- Brealey, R. A., & Myers, S. C. (2000). *Principles of Corporate Finance*. (6th ed.), New York, USA: McGraw-Hill.
- R. Geske, R. (1977). The Valuation of Corporate Liabilities as Compound Options. *Journal of Financial and Quantitative Analysis*, 12, 541 – 552.
- Gestel, T. V., Baesens, B., Suykens, J., Poel, D. V., Baestaens, D. E., & Willekens, M. (2006). Bayesian kernel based classification for financial distress detection. *European Journal of Operational Research*, 172, 979 – 1003.
- Gordon, M. J. (1971). Towards a Theory of Financial Distress. *Journal of Finance*, 26(2), 347 – 356.
- Henderson, B. (1970). *The Product Portfolio*.
https://www.bcgperspectives.com/content/classics/strategy_the_product_portfolio/
- Kahya, E., & Theodossiou, P. (1999). Predicting Corporate Financial distress: A Time-Series CUSUM Methodology. *Review of Quantitative Finance and Accounting*, 13, 323 – 345.
- Lando, D. (1998). On Cox Processes and Credit Risky Securities. *Review of Derivatives Research*, 2, 99 – 120.
- Merton, R. C. (1974). On the Pricing of Corporate Debt: The Risk Structure of Interest Rates. *Journal of Finance*, 2, 449 – 471.
- Outecheva, N. (2007). *Corporate Financial Distress: An Empirical Analysis of Distress Risk*. Ph.D. Dissertation, University of St. Gallen, St. Gallen, Germany.
- Pearson, C. M., & Claire, J. A. (1998). Reframing crisis management. *Academy of Management Review*, 23(1), 59 – 76.
- Robbins, S. P. (1990). *Organization Theory: The Structure and Design of Organizations*. Englewood Cliffs, NJ, USA: Prentice Hall.
- Roux-Dufort, C. (2007). A passion for imperfections: revisiting crisis management. In: Pearson, C. M., C. Roux-Dufort, C., & Claire, J. A. (Eds.), *International Handbook of Organizational Crisis Management*, (pp. 221 – 252). Thousand Oaks, CA, USA: Sage.
- Salchenberger, L. M., Cinar, E. M., & Lash, N. A. (1992). Neural Networks: A New Tool for Predicting Thrift Failures. *Decision Sciences*, 23, 899 – 916.
- Shin, K., & Lee, Y. (2002). A Genetic Algorithm Application in Bankruptcy Prediction Modeling. *Expert Systems with Applications*, 23(3), 321 – 328.
- Gorbenko, A. S., & Strebulaev, I. A. (2010). Temporary versus Permanent Shocks: Explaining Corporate Financial Policies. *Review of Financial Studies*, 23, 2591 – 2647.
- Wruck, K. (1990). Financial Distress, Reorganization, and Organizational Efficiency. *Journal of Financial Economics*, 27, 419 – 444.

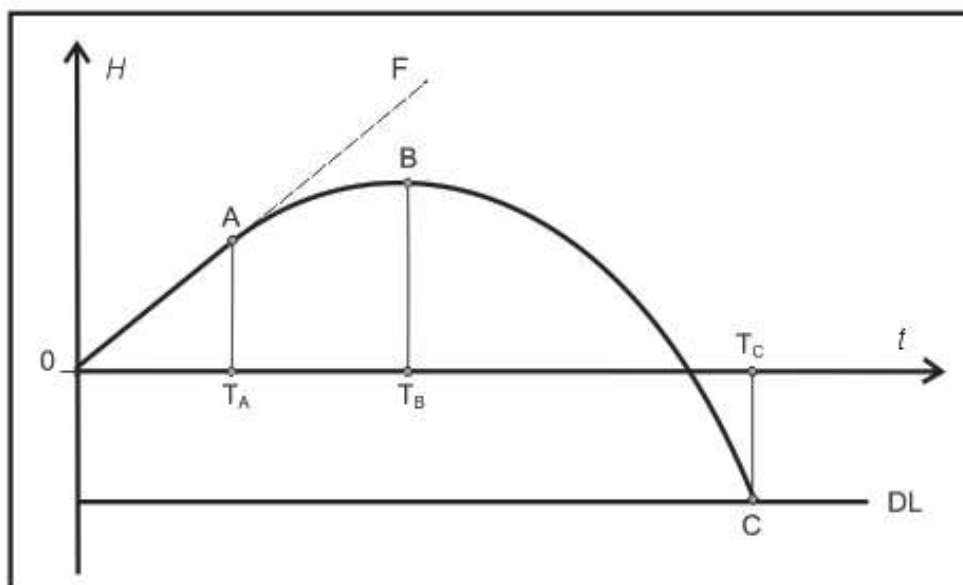


Figure 1: Decline in a mean logarithm of corporate assets H over time t in a crisis.

Line OF is the line of corporate steady progress before the crisis onset at point A . T_A is the time of the crisis onset; since that moment corporate ROA linearly declines over time. Point B is the maximum point in the trajectory of the mean logarithm of corporate assets, $ROA(T_B) = 0$. If the crisis is left unattended, a hard default occurs at point C , $x(T_C) = x_{min}$.

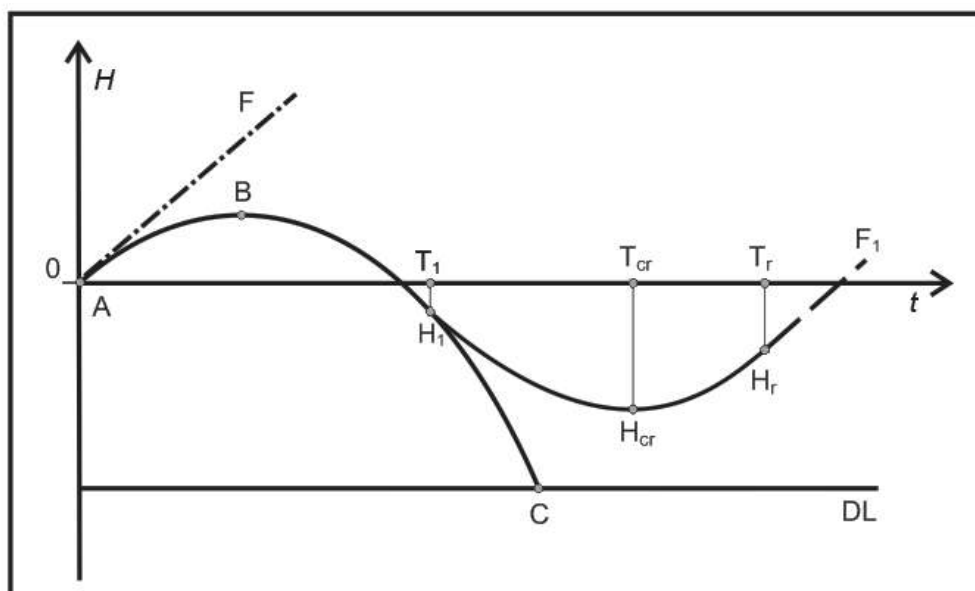


Figure 2: Recovery trajectory for the logarithm of corporate assets passing through the points H_l , H_{cr} , and H_r .

PROBABILITY OF DEFAULT IN CORPORATE ECONOMIC DISTRESS, OR WHAT RISK DOES MARKET REWARD?

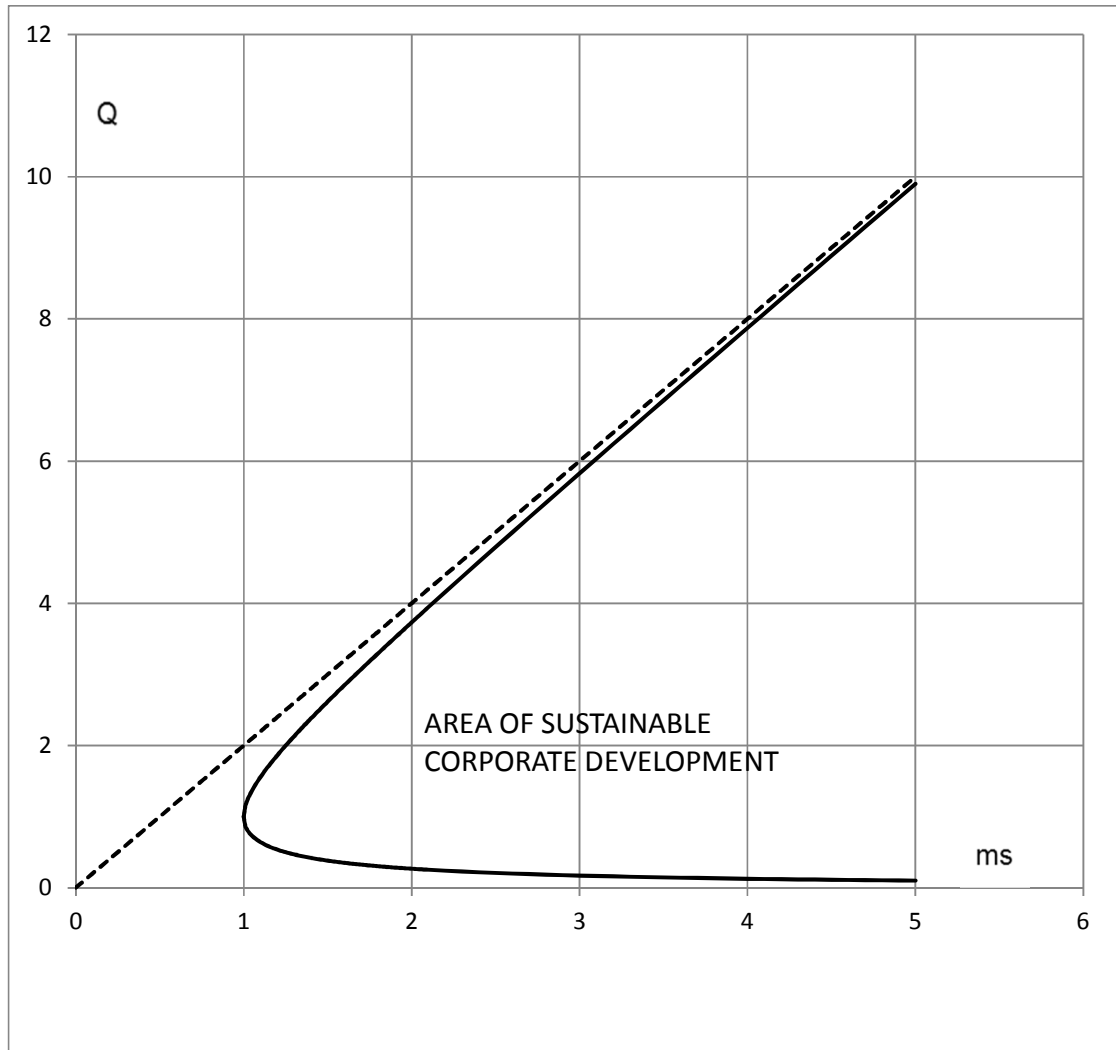


Figure 3: The area of a steady corporate progress, $Q = \alpha_p C / (2R_1 \sigma_0)$, $ms = (H_A - DL) / (\alpha_p \sigma_0)$.

The area of a steady corporate progress, where the intensity of the probability of default remains less than 0.05, lies inside the curve.

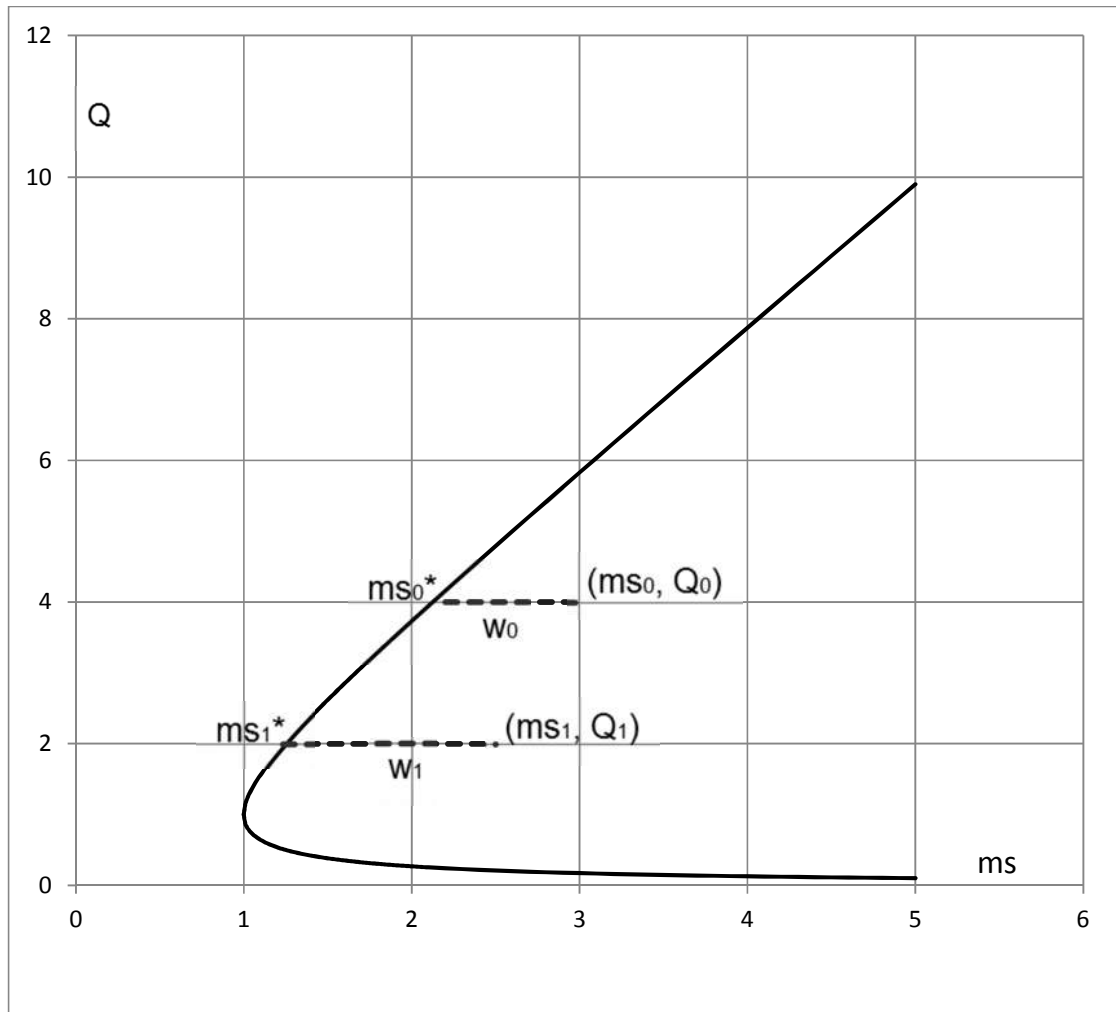


Figure 4: Illustration to calculations of the logarithms of available free money $w_0 = \ln W_0$, $w_1 = \ln W_1$ for different corporate positions (ms_0, Q_0) and (ms_1, Q_1) .

PROBABILITY OF DEFAULT IN CORPORATE ECONOMIC DISTRESS, OR WHAT RISK DOES MARKET REWARD?

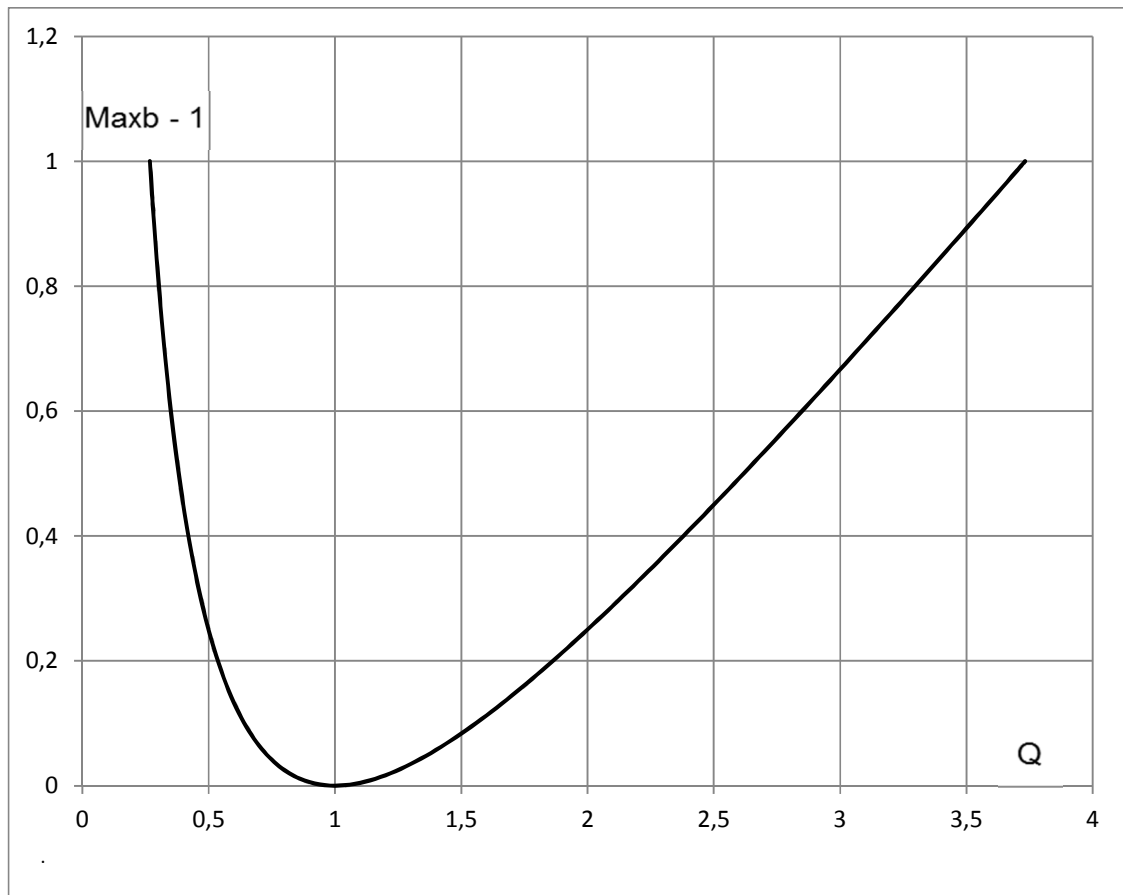


Figure 5: Maximum increase of corporate volatility $Maxb$ ($\sigma_m^1 = b\sigma_m^0$) securing increase in free money ($w_1 - w_0 > 0$) keeping the same probability of default as a function of the initial value $Q_0 = \alpha_p C / (2R_1^0 \sigma_0^0)$, $ms_0 = 2$.

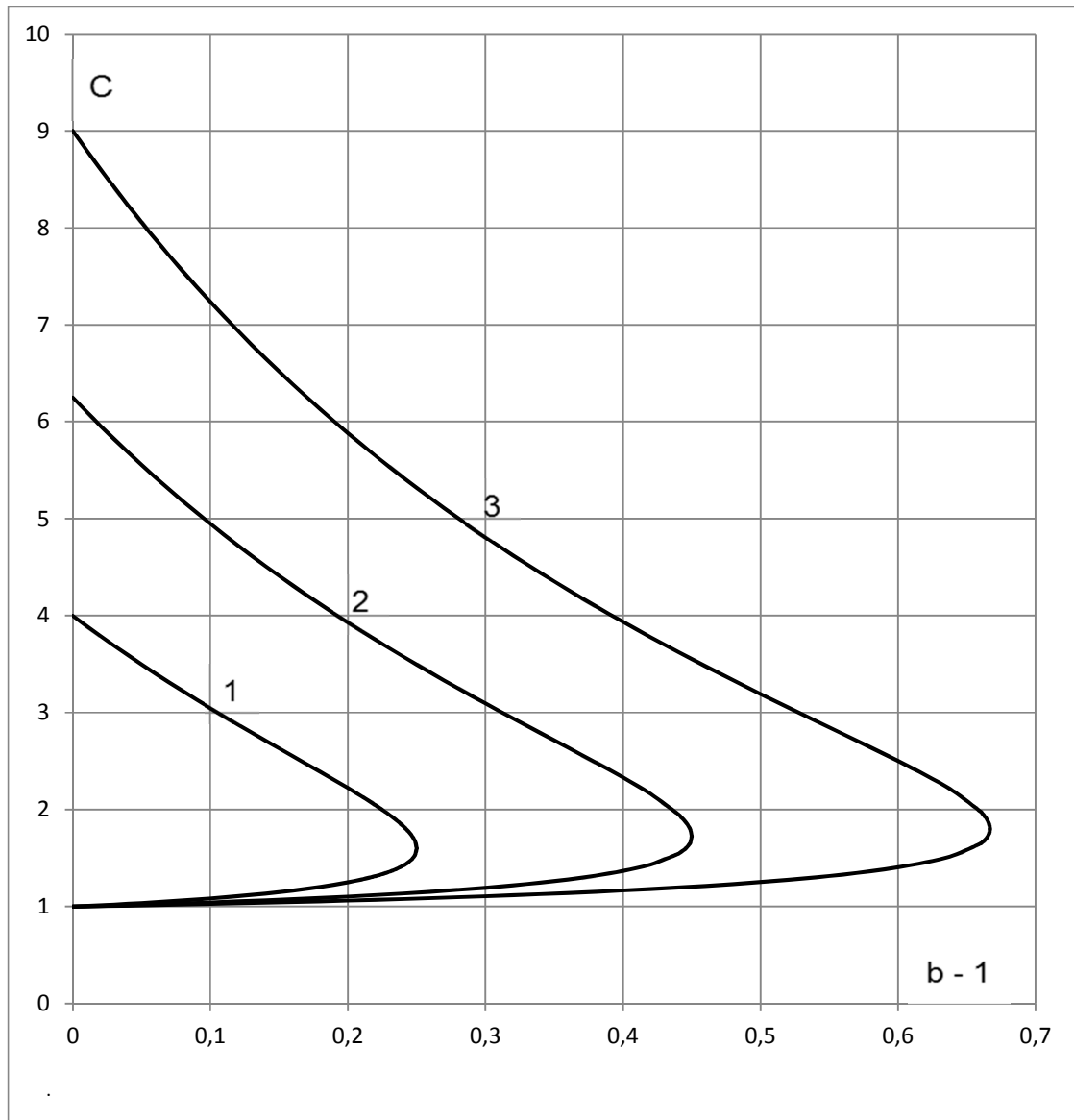


Figure 6: Areas of parameter c ($R_1^1 = cR_1^0$) securing increase in free money ($w_1 - w_0 > 0$) and keeping the same probability of default as a function of the volatility growth b ($\sigma_m^1 = b\sigma_m^0$) for $ms_0 = 2$ and three values of Q_0 : $Q_0 = 2$ (line 1), $Q_0 = 2.5$ (line 2), $Q_0 = 3$ (line 3).

FINANCE, RISK AND ECONOMIC SPACE

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Abstract: *This paper presents new approach to financial modeling and forecasting that is based on economic space notion. Economic space is defined as generalization of risk ratings and allows boost methods and description of financial processes. Risk ratings of economic agents are treated as coordinates of economic agents on economic space. Economic and financial variables of separate economic agents determine macroeconomic and financial variables as functions of time and coordinates on economic space. That permits describe financial relations similar to mathematical physics equations. Financial models can be described on discreet and continuous economic spaces with dimension determined by number of major risks measured simultaneously. To show advantages of economic space usage to financial modeling we present extension of Black-Scholes-Merton equation on n-dimensional economic space; develop macroeconomic models on economic space in a way similar to hydrodynamics and derive financial wave equations.*

Keywords: *risk ratings, economic space, option pricing, financial wave equations.*

JEL Classifications: *C500, C520, C530, C600, G110, G130*

Introduction

This paper presents new approach to economic and financial modeling that is based on economic space notion. Economic space is defined as generalization of risk ratings and allows boost methods and description of financial processes. Risk ratings of economic agents are treated as coordinates of economic agents on economic space. Agent based economic modeling (Judd & Tesfatsion (2005)) has a long history. The term “economic space” was used in economics at least since Perroux (1950), and mostly relates to spatial econometrics (Asada & Ishikawa, (2007) and Fujita (2010)). Out treatment of economic agents and economic space is completely different. Let regard economic agents as economic “particles” on economic space and develop economic models alike to description of many particles systems in physics. Each economic agent is described by set of extensive economic and financial variables as Supply and Demand, Production Function and Capital, Consumption and Value and etc. Aggregation of extensive variables of separate economic agents at point x on economic space permit introduce macroeconomic and financial variables as functions of coordinates on economic space. Such approach allows establish parallels with physical kinetics and hydrodynamics and permit derive wave equations for financial variables. Wave processes play fundamental role for most physical phenomena’s. It seems important develop and study models that describe wave generation, propagation and interaction of economic and financial variables.

The paper is organized as follows. In Section 2 we argue economic space notion. In Section 3 we discuss option pricing on n-dimensional economic space and derive extension for Black-Scholes-Merton equation. In Section 4 we present macroeconomic models similar to

hydrodynamics and derive financial wave equations on economic space. The conclusions are in Section 5.

On economic space notion

Any attempt to develop a theory on certain space requires procedure that measure coordinates on a given space. In physics such problem is solved by measurements of coordinates of physical particles and bodies on a space-time.

We propose that current risk management and risk ratings in particular form basis for economic space definition. Let note BIS (2011, 2014) as brief references for economic and financial risk management studies and risk ratings that are provided by international rating agencies as Fitch (2010), Moody's (2007), S&P (2012) and DBRS (2015). Let assume that risk ratings can be established for any economic agent.

Current risk ratings procedures distribute economic agents like companies, corporations and banks over finite number of risk grades, like *AAA*, *BB*, *CCC* and so on. Each risk grade can be treated as a point of discreet space. Risk ratings procedures provided by rating agencies can be treated as measurements of coordinates of economic agents on discreet space. Risk grades of a single risk can be treated as coordinates on one-dimensional discreet space. The simultaneous estimations of risk grades for n different risks are similar to measuring coordinates on n -dimensional discreet space. Existing risk ratings practices can be treated as procedures that distribute economic agents on discreet space. Let mention such space as economic space and state that positive direction along each axis is treated as risk growth direction and negative direction points to small risks values.

Current risk ratings methodologies presented by Fitch, Moody's, S&P and DBRS utilize finite number of risk grades that can be treated as discreet space points. Let propose that these methodologies can be extended from discreet to continuous risk space representation. We suggest study n different risk ratings on Euclidian space R^n . Description of economic agents and their economic variables as functions on economic space allows define and describe macroeconomic and finance variables. For example, aggregate Money Demand of separate economic agents that have coordinates near point x determine macroeconomic Money Demand at point x . Money Demand becomes a function of economic space coordinates and integral of Money Demand function over economic space defines Money Demand of entire Economics. Thus financial variables of economic agents form basis for definition of macroeconomic variables as functions on e-space. Let refer Euclidian space R^n or discreet space, or any other mathematical space that is used for mapping risk grades of economic agents as economic space or e-space. Below we develop economic modeling on Euclidian R^n economic space.

Definition of economic space as an extension of risk grades and ability to describe global financial variables as functions on economic space allows apply modern methods of mathematical physics and enrich financial modeling. On the other hand introduction of economic space arises new problems that outline internal complexity of global financial modeling and forecasting.

To describe financial processes on economic space R^n it is necessary determine n risks that disturb finance system. It seems impossible to take into account all existing risks that affect current financial evolution. Risk ratings procedures contain internal uncertainty and that uncertainty will grow up with the number of simultaneously measured risks. If one takes into account too many different risks then the simultaneous measurements of all these risk ratings will have too high variability and hence the model description can be too uncertain. To determine a reasonable economic space one should estimate current risks and select two, three, four most important risks as main factors affecting contemporary economics and financial

system. Then it is possible to define economic space with two or three dimensions and derive appropriate initial distributions of economic variables as functions of most powerful risks. To select most valuable risks one should establish procedures that allow compare the influence of different risks on financial processes. That permits determine the initial state of economic space R^n .

To describe financial evolution in a time term T it is necessary to forecast m main risks that will play major role in a particular time term and to define economic space R^m . The set of m risks can be the same as for the initial state, or different one. This set of m risks defines the target state of economic space R^m . Then it is necessary to define the transition dynamics that describes the move from initial set of n main risk on economic space R^n to the target set of m main risk on economic space R^m . Such transition dynamics from initial set of n main risk to the target set of m risks describes the evolution of initial representation R^n of to the target one R^m .

That arises a lot of difficult problems. The selection of main risk factors simplifies description and allows neglect “small risks”. On the other hand the selection process becomes a part of validation procedure. As one can select and measure main risk factors, then it is possible to validate the initial and target set of risk and to prove or disprove initial model assumptions. The procedure and criteria’s to measure and to compare the power of different risks on financial processes should be determined and that is a separate tough problem.

The financial modeling and forecasting on economic space is splitting into a set of verification procedures. It gives a chance to make financial modeling more measurable and it’s forecasting more faithful. In the next two Sections we demonstrate advantages of economic space usage for financial modeling: we present treatment of option pricing on economic space. Then we develop macroeconomic models similar to hydrodynamics and derive financial wave equations.

Option pricing on economic space

Option pricing theory is based on the Black-Scholes-Merton equation (BSM) (Black & Scholes, 1973; Merton, 1973; Merton, 1998) and that is one of the most recognized equations in financial theory. We present an extension of BSM equation on the n -dimensional economic space. Further we shall mention economic space as e-space.

The BSM equation for the price V of the option on the underlying asset with price a has the form:

$$\frac{\partial V}{\partial t} + ra \frac{\partial V}{\partial a} + \frac{1}{2} \sigma^2 a^2 \frac{\partial^2 V}{\partial a^2} = rV \quad (1)$$

Here, r is the risk-free interest rate. A simple way to derive BSM equation (Merton, 1998; Hull, 2009) is based on the assumption that the asset price a obeys Brownian motion $dW(t)$

$$da = a c dt + a \sigma dW(t) \quad (2)$$

$$\langle dW(t) \rangle = 0; \langle dW(t)dW(t+T) \rangle = \delta(T)dt$$

c – is the instantaneous rate of return on the security, and σ^2 – is the instantaneous variance rate. The option price $V = V(t, a)$ is a function of time t and security price a . Operator $\langle \dots \rangle$ denotes the averaging procedure.

Let argue option pricing on n -dimensional e-space and derive extension for BSM equation. Let regard options on shares of corporations and banks and mention these economic agents as economic particles (e-particles). Shares price of individual e-particle is determined by market value of e-particle and depends on its e-space coordinates or risk grades associated with

selected e-particle. Market value of e-particle that is under the influence of n risks becomes function of time and coordinates of e-particle on n -dimensional e-space R^n . Thus, for fixed outstanding shares, shares price a of e-particle becomes a function time t and coordinates $\mathbf{x}=(x_1, \dots, x_n)$ on n -dimensional e-space R^n and $a=a(t, \mathbf{x})$. Hence option price V also should be a function of time t , coordinates $\mathbf{x}=(x_1, \dots, x_n)$ on the n -dimensional e-space R^n and stocks price a and takes the form $V=V(t, \mathbf{x}, a)$. To derive extension for BSM equation on e-space R^n let suggest two assumptions.

First, let extend (2) and assume that shares price has linear dependence on $d\mathbf{x}$:

$$da = a c dt + a \sigma dW(t) + a \mathbf{k} \cdot d\mathbf{x} \quad (3)$$

Vector \mathbf{k} describes the input of the e-space coordinates variation $d\mathbf{x}$ on the value of e-particle and thus on shares price; $\mathbf{k} \cdot d\mathbf{x}$ denotes the scalar product.

Second, let assume that the coordinates \mathbf{x} of the e-particle also obey Brownian walk $d\mathbf{Z}(t)$ on the n -dimensional e-space

$$d\mathbf{x} = \mathbf{v}dt + d\mathbf{Z}(t) \quad (4)$$

Vector \mathbf{v} defines the regular speed of the e-particle on the e-space. Brownian motion $dZ_i(t)$ along each axis of the n -dimensional e-space follows

$$\langle dZ_i(t) \rangle = 0; \langle dZ_i(t)dZ_j(t+T) \rangle = \eta_i^2 \delta_{i,j} \delta(T)dt \quad (5)$$

Vector $\boldsymbol{\eta}=(\eta_1, \dots, \eta_n)$ determines the instantaneous variance rate along each axis in the e-space R^n . For simplicity, we assume that there are no correlations between $dW(t)$ and $dZ_i(t)$

$$\langle dW(t_1) dZ_i(t_2) \rangle = 0$$

Assumptions (3-5) allow derive the equation for the option price $V=V(t, \mathbf{x}, a)$ as an extension of the BSM equation (3) on the n -dimensional e-space R^n .

$$\frac{\partial V}{\partial t} + ra \frac{\partial V}{\partial a} + rx_i \frac{\partial V}{\partial x_i} + \frac{1}{2} a^2 q^2 \frac{\partial^2 V}{\partial a^2} + k_i \eta_i^2 \frac{\partial^2 V}{\partial a \partial x_i} + \frac{1}{2} \eta_i^2 \frac{\partial^2 V}{\partial x_i^2} = rV \quad (6)$$

$$q^2 = (\sigma^2 + k_i^2 \cdot \eta_i^2); i = 1, \dots, n$$

The derivation of (6) based on Ito formula and similar to Hull (2009) and we omit it here. Here r is same risk-free interest rate as in (1).

Equation (6) has the same structure as (1). It belongs to diffusion like equations and it's solutions are well known.

Let outline some issues concern option pricing on n -dimensional e-space. Equations (1,6) are valid if initial set of n risks that define n -dimensional e-space is constant. Due to considerations presented in Section 2, initial selection of n risks that determines initial e-space R^n can differ from final set of m risks and final e-space R^m . If during the time to expiration the forecast predicts that new risks can affect the e-particle value, then the option pricing should be corrected. For such a case the option pricing should depends on description of the transition from the initial e-space R^n to the final e-space R^m . Thus equation (6) has sense if initial set of risks remains constant. If some new risks grow up during the term to expiration then assumptions (3-5) and equation (6) should be modified. Thus, original assumption (2) and BSM equations (1) seems fail to describe the option price V for the case with different sets of initial and final risks that affect the value a of the underlying assets. The modification of (1,2) and (3-

6) should describe the transformation from initial e-space to the final one and that requires additional studies and considerations.

Further let regard macroeconomic models on e-space.

Macroeconomic models and financial wave equations

Let study economics as ensemble of economic agents like banks and corporations, consumers and personal investors, householders and labor and so on. Let assume that each economic agent is described by a set of l extensive economic and financial variables that form the vector (u_1, \dots, u_l) . Introduction of economic space allows develop models that have parallels with physical kinetics and hydrodynamics. Let refer further economic agents as economic particles (e-particles). Let denote economic kinetics as approximations that describe a system of e-particles on e-space and economic hydrodynamics as approximations that model behavior of macroeconomic and financial variables that are treated as economic fluids (e-fluids) on e-space.

Economic Kinetics

Let assume that each e-particle (each economic agent) on n -dimensional e-space R^n at moment t is described by coordinates $\mathbf{x}=(x_1, \dots, x_n)$, velocity $\mathbf{v}=(v_1, \dots, v_n)$, and l extensive economic and financial variables (u_1, \dots, u_l) . Let regard extensive variables because it is possible to average them within probability distribution. Intensive variables like prices or interest rates cannot be averaged directly. Enormous number of extensive variables like Value and Capital, Demand and Supply, Profits and Production Function and so on describe each e-particle and that increase complexity of description to compare with physical kinetics. Contrary to physics, economic and financial variables do not obey conservation laws and can change their values due to economic processes and their motion on e-space.

Let assume that there are N e-particles on e-space and number of e-particles that are observed at point \mathbf{x} equals $N(\mathbf{x})$. Let state that velocities of e-particles at point \mathbf{x} equal $\mathbf{v}=(v_1, \dots, v_{N(\mathbf{x})})$. Each e-particle has l economic variables (u_1, \dots, u_l) . Let assume that values of economic variables equal (u_{1i}, \dots, u_{li}) , $i=1, \dots, N(\mathbf{x})$. Each economic variable u_j at point \mathbf{x} defines macroeconomic variable U_j as sum of economic variables u_j of $N(\mathbf{x})$ e-particles at point \mathbf{x}

$$U_j = \sum_i u_{ji} ; \quad j = 1, \dots, l ; \quad i = 1, \dots, N(\mathbf{x})$$

For each macroeconomic variable U_j let define analogy of impulses \mathbf{P}_j as

$$\mathbf{P}_j = \sum_i u_{ji} \mathbf{v}_i ; \quad j = 1, \dots, l ; \quad i = 1, \dots, N(\mathbf{x})$$

Let follow Landau and Lifshitz (1981) and introduce economic analogy of Boltzmann's distribution function $f=f(t, \mathbf{x}; U_1, \dots, U_l, \mathbf{P}_1, \dots, \mathbf{P}_l)$ on n -dimensional e-space that determine probability to observe macroeconomic variables U_j and impulses \mathbf{P}_j at point \mathbf{x} at time t . Let define macroeconomic density function $U_j(t, \mathbf{x})$

$$U_j(t, \mathbf{x}) = \int U_j f(t, \mathbf{x}, U_1, \dots, U_l, \mathbf{P}_1, \dots, \mathbf{P}_l) dU_1 \dots dU_l d\mathbf{P}_1 \dots d\mathbf{P}_l ; \quad j = 1, \dots, l \quad (7.1)$$

and impulse density $\mathbf{P}_j(t, \mathbf{x})$ as

$$\mathbf{P}_j(t, \mathbf{x}) = \int \mathbf{P}_j f(t, \mathbf{x}, U_1, \dots, U_l, \mathbf{P}_1, \dots, \mathbf{P}_l) dU_1 \dots dU_l d\mathbf{P}_1 \dots d\mathbf{P}_l ; \quad j = 1, \dots, l \quad (7.2)$$

That allows define e-space velocity $\mathbf{v}_j(t, \mathbf{x})$ of density $U_j(t, \mathbf{x})$ as

$$U_j(t, \mathbf{x}) \mathbf{v}_j(t, \mathbf{x}) = \mathbf{P}_j(t, \mathbf{x})$$

Densities $U_j(t, \mathbf{x})$ and impulses $\mathbf{P}_j(t, \mathbf{x})$ are determined as aggregates of corresponding economic and financial variables of separate e-particles. Functions $U_j(t, \mathbf{x})$ can describe e-space density of Demand and Supply, Assets and Debts, Production Function and Value Added and so on. E-space densities $U_j(t, \mathbf{x})$ as Value and Capital, Supply and Demand play the role similar to mass density distribution $\rho(t, \mathbf{x})$ in physical kinetics (Landau & Lifshitz, 1981). We use (7.1-7.2) as tool to establish transition from description of economic and financial variables (u_1, \dots, u_l) of separate economic agents to description of macroeconomic densities (U_1, \dots, U_l) , $U_j = U_j(t, \mathbf{x})$ on e-space and develop economic and financial models alike hydrodynamics.

Economic Hydrodynamics

In parallels to physical mass densities $\rho(t, \mathbf{x})$ of physical fluids, let treat e-space densities $U_1(t, \mathbf{x}), \dots, U_l(t, \mathbf{x})$ like Value and Capital, Production Function and Investments, Demand and Supply as economic fluids. Macroeconomics describes interaction of economic and financial densities $U_1(t, \mathbf{x}), \dots, U_l(t, \mathbf{x})$ similar to multi-fluids hydrodynamics and appears to be extremely complex. Parallels between physical and economic densities permit obtain e-fluids equations alike to Continuity Equation and Equation of Motion for physical fluids (Landau & Lifshitz, 1987). Let present phenomenological derivation of e-fluid equations.

Continuity Equation for density $U_i(t, \mathbf{x})$, $i=1, \dots, l$ takes form

$$\frac{\partial U_i}{\partial t} + \text{div}(\mathbf{v}_i U_i) = Q_1 \quad (8)$$

$\mathbf{v}_i(t, \mathbf{x})$ - is the velocity of e-fluid U_i on e-space. Left side describes the flux of density $U_i(t, \mathbf{x})$ through the unit volume surface on e-space and factor Q_1 describes transformation of $U_i(t, \mathbf{x})$. Contrary to physics and mass conservation law, Continuity Equations on densities don't conform the value of densities and $U_i(t, \mathbf{x})$ can increase or decrease in time and during the motion of the selected volume on e-space due to economic reasons. For example, Value in e-space unit volume can increase in time due to economic activity and can decrease if unit volume moves in the direction of risk growth. We state that there are no conservation laws for economic and financial densities.

Equation of Motion for density $U_i(t, \mathbf{x})$ takes form

$$U_i \left[\frac{\partial \mathbf{v}_i}{\partial t} + (\mathbf{v}_i \cdot \nabla) \mathbf{v}_i \right] = Q_2 \quad (9)$$

Left side describes the flux of $U_i(t, \mathbf{x}) \mathbf{v}_i(t, \mathbf{x})$ through the surface of unit volume on e-space, taking into account Continuity Equation. Q_2 describes factors that change the flux. We state that in the first approximation extensive economic variables of different economic agents (different e-particles) do not interact and do not depend on the same economic variables of separate e-particles. For example, Production Function of e-particle does not depend on the Production Function of other e-particles, but depends on other financial and economic variables like Capital, Labor, Market Demand, Investments and so on. As well Consumption of e-particle does not depend on Consumption of other e-particles, but is determined by Income, Savings, Inflation and etc. In the first approximation we neglect any interactions between same economic variables of different e-particles and state that there are no economic analogies for such physical factors as pressure or viscosity. We state that Q_1 and Q_2 in equations on $U_i(t, \mathbf{x})$ depend on economic densities $U_j(t, \mathbf{x})$ or their velocities those different from $U_i(t, \mathbf{x})$. We denote such densities $U_j(t, \mathbf{x})$ or their velocities $\mathbf{v}_j(t, \mathbf{x})$ that define Q_1 and Q_2 and induce changes of

particular variable $U_i(t, \mathbf{x})$ as conjugate densities to $U_i(t, \mathbf{x})$. For example, Production Function density may have conjugate densities like Capital and Labor. Conjugate variables define Q_1 and Q_2 in the right hand side of Continuity Equation and Motion Equations (8,9). The simplest model (8,9) describes two conjugate e-fluids and for that case we derive economic wave equations on e-space.

Financial wave equations

Wave processes describe enormous amount of physical phenomena's and play the core role in current understanding of Nature. Certain parallels should exist in economics and finance. Up now terms "waves" are used for Kondratieff waves, Inflation waves, Crisis waves, Demographic waves and so on. All these issues describe time oscillations only but not wave propagation. To describe financial wave propagation one requires determine certain space. Introduction of economic space allows study financial and economic wave processes that can be extremely important for financial analysis and crisis modeling, forecasting and managing.

Let show that economic equations (8,9) can be origin for various wave processes and derive wave equations on e-space for the simplest model of two conjugate e-fluids. Let study relations between Money Demand and Interest Rate: the rise in Money Demand lead to Interest Rate growth; as well Interest Rates growth decline Demand for Money. The similar relations exist between Investments and Interest Rates; between Commodity Demand and Commodity Price etc. Relations between these variables reflect positive-negative response. Let describe interaction for two conjugate e-fluids model.

Model: Money Demand – Interest Rate.

Let argue the interaction between Money Demand and Interest Rate. Money Demand is extensive variables and thus Money Demand $u_d(t, \mathbf{x})$ of separate e-particles, separate economic agents in the neighborhood of point \mathbf{x} on e-space construe Money Demand density function $U_D(t, \mathbf{x})$ (7.1). Interest Rate $r(t, \mathbf{x})$ is intensive economic variable and for fixed time term describes Cost of Money supply $U_S(t, \mathbf{x})$ available to e-particles at point (t, \mathbf{x}) . For given Money Supply $U_S(t, \mathbf{x})$ and fixed time term Cost of Money $U_C(t, \mathbf{x})$:

$$U_C(t, \mathbf{x}) = r(t, \mathbf{x}) U_S(t, \mathbf{x})$$

Thus for constant Money Supply $U_S(t, \mathbf{x})$, the Cost of Money supply $U_C(t, \mathbf{x})$ depends on Interest Rate only. Rise in Money Demand $U_D(t, \mathbf{x})$ lead to growth of Interest Rate $r(t, \mathbf{x})$ and hence growth of Money supply Cost $U_C(t, \mathbf{x})$. As well growth of Money supply Cost $U_C(t, \mathbf{x})$ being induced by growth of Interest Rate $r(t, \mathbf{x})$ imply decline of Money Demand $U_D(t, \mathbf{x})$. Thus let replace Interest Rate $r(t, \mathbf{x})$ as intensive variable by Money supply Cost $U_C(t, \mathbf{x})$ as extensive variable taking into account that $U_C(t, \mathbf{x})$ depends on Interest Rate only with $U_S(t, \mathbf{x})$ being constant. Hence we obtain two conjugate e-fluids model Money Demand $U_D(t, \mathbf{x})$ - $U_C(t, \mathbf{x})$ Money supply Cost and can argue forms of right hand side factors for equations (8,9).

Let assume that Q_1 factor in the right hand side of Continuity equation (8) on Money Demand density function U_D is proportional to time derivative of $U_C(t, \mathbf{x})$ Money supply Cost density function with negative factor $\alpha_C < 0$:

$$Q_1 \sim \alpha_C \partial U_C(t, \mathbf{x}) / \partial t$$

Q_1 factor for Continuity equation on Money supply Cost density function U_C is proportional to time derivative of Money Demand density function $U_D(t, \mathbf{x})$ with positive factor $\alpha_D > 0$:

$$Q_1 \sim \alpha_D \partial U_D(t, \mathbf{x}) / \partial t$$

Thus positive growth in time of Money Demand density $U_D(t, \mathbf{x})$ induce growth of Money supply Cost density function $U_C(t, \mathbf{x})$ due to rise of interest rate $r(t, \mathbf{x})$. As well positive growth in time of Money supply Cost density $U_C(t, \mathbf{x})$ reduce Money Demand density function $U_D(t, \mathbf{x})$. Let state that Q_2 factor for Equation of Motion (9) on Money Demand velocity \mathbf{v}_D is proportional to gradient ∇U_C of Money supply Cost density function U_C with negative factor $\beta_C < 0$:

$$Q_2 \sim \beta_C \nabla U_C$$

Let state that Q_2 factor for Equation of Motion on Money supply Cost velocity \mathbf{v}_C is proportional to gradient ∇U_D of Money Demand density function U_D with positive factor $\beta_D > 0$:

$$Q_2 \sim \beta_D \nabla U_D$$

Our assumptions means that Money Demand velocity \mathbf{v}_D decrease in the direction of positive gradient of Money supply Cost density function U_C and Money supply Cost velocity \mathbf{v}_C increase in the direction with positive gradient of Money Demand density function U_D . Our assumptions present the simplest model of possible mutual dependence of two conjugate e-fluids like Money Demand density function U_D and Money supply Cost density function U_C on e-space. For simplicity we use money supply cost density function $U_C(t, \mathbf{x})$ notion to define dependence of Money Demand density $U_D(t, \mathbf{x})$ on Interest Rate $r(t, \mathbf{x})$. Equations (8,9) describe two conjugate e-fluids model $U_D(t, \mathbf{x}) - U_C(t, \mathbf{x})$ of Money Demand - Cost of Money supply. Continuity Equations take form:

$$\frac{\partial U_D}{\partial t} + \nabla \cdot (\mathbf{v}_D U_D) = \alpha_C \frac{\partial U_C}{\partial t} ; \quad \frac{\partial U_C}{\partial t} + \nabla \cdot (\mathbf{v}_C U_C) = \alpha_D \frac{\partial U_D}{\partial t}$$

Equations of Motion take form:

$$U_D \left[\frac{\partial \mathbf{v}_D}{\partial t} + (\mathbf{v}_D \cdot \nabla) \mathbf{v}_D \right] = \beta_C \nabla U_C ; \quad U_C \left[\frac{\partial \mathbf{v}_C}{\partial t} + (\mathbf{v}_C \cdot \nabla) \mathbf{v}_C \right] = \beta_D \nabla U_D$$

$$\alpha_D > 0 ; \alpha_C < 0 ; \beta_D > 0 ; \beta_C < 0 ; \quad (10)$$

To derive wave equations let's regard linear approximation on small disturbances $q_{D,C}$ for constant Money Demand U_D and Money supply Cost densities U_C and assume that velocities $\mathbf{v}_{D,C}$ are small. In physics similar approximations are used for derivation of acoustic wave equations (Landau & Lifshitz, 1987)

$$U_D = U_{D0} + q_D ; U_{D0} = \text{const} ; \quad U_C = U_{C0} + q_C ; U_{C0} = \text{const}$$

Continuity Equations on small disturbances $q_{D,C}$ and $\mathbf{v}_{D,C}$ takes the form

$$\frac{\partial q_D}{\partial t} + U_{D0} \nabla \cdot \mathbf{v}_D = \alpha_C \frac{\partial q_C}{\partial t} ; \quad \frac{\partial q_C}{\partial t} + U_{C0} \nabla \cdot \mathbf{v}_C = \alpha_D \frac{\partial q_D}{\partial t}$$

Equations of Motion on small velocities take the form:

$$U_{D0} \frac{\partial \mathbf{v}_D}{\partial t} = \beta_C \nabla q_C ; \quad U_{C0} \frac{\partial \mathbf{v}_C}{\partial t} = \beta_D \nabla q_D$$

The second derivation by time of Continuity Equation implies:

$$\frac{\partial^2 q_D}{\partial t^2} + U_{D0} \nabla \cdot \frac{\partial}{\partial t} \mathbf{v}_D = \alpha_C \frac{\partial^2 q_C}{\partial t^2} \quad ; \quad \frac{\partial^2 q_D}{\partial t^2} = \alpha_C (\alpha_D \frac{\partial^2 q_D}{\partial t^2} - \beta_D \Delta q_D) - \beta_C \Delta q_C$$

$$\frac{\partial^2}{\partial t^2} [(1 - \alpha_C \alpha_D) \frac{\partial^2 q_D}{\partial t^2} + \alpha_C \beta_D \Delta q_D] = - \beta_C \Delta (\alpha_D \frac{\partial^2 q_D}{\partial t^2} - \beta_D \Delta q_D)$$

Equations on disturbances $q_{D,C}$ take form

$$\left[(1 - \alpha_C \alpha_D) \frac{\partial^4}{\partial t^4} + (\alpha_C \beta_D + \beta_C \alpha_D) \Delta \frac{\partial^2}{\partial t^2} - \beta_C \beta_D \Delta^2 \right] q_{D,C} = 0 \quad (11)$$

To show that equations (11) admit wave solutions let regard $q_{D,C} = q(x-ct)$ or take Fourier transforms for $\exp(\mathbf{k} \cdot \mathbf{x} - \omega t)$ and define speed c as $c = \omega/k$. For positive $c_{1,2}^2 > 0$ equations (11) on disturbances $q_{D,C}$ take form of bi-wave equation:

$$(\frac{\partial^2}{\partial t^2} - c_1^2 \Delta) (\frac{\partial^2}{\partial t^2} - c_2^2 \Delta) q_{D,C} = 0 \quad (12)$$

$$c_{1,2}^2 = \frac{-(\alpha_D \beta_C + \alpha_C \beta_D) \pm \sqrt{(\alpha_D \beta_C - \alpha_C \beta_D)^2 + 4 \beta_D \beta_C}}{2(1 - \alpha_D \alpha_C)} \quad (13)$$

For (10) $c_{1,2}^2 > 0$ if $(\alpha_D \beta_C - \alpha_C \beta_D)^2 + 4 \beta_D \beta_C > 0$

Bi-wave equations (12) describe propagation of waves $q = q(\mathbf{x} - c\mathbf{t})$ with speed c equals c_1 or c_2 as in the direction of risks growth as in the direction of small risks values. Existence of wave processes on economic space allows describe economic and financial wave generation, propagation and interaction, permit modeling possible wave response on economic and financial shocks and study wave phenomena's of financial crisis evolution. Bi-wave equations (12) reflect wave processes that are more complex to compare with second order wave equations. Green functions for bi-wave equations take form of convolution of two Green functions for wave equations.

Positive-negative response is not necessary condition to derive wave equations for two conjugate e-fluids interacting model. For example positive response coefficients like $\alpha_D = 2$; $\alpha_C = \beta_D = \beta_C = 1$ delivers $c_{1,2}^2 > 0$ and thus provide bi-wave equation regime.

Let outline that equations (11) admit wave propagation with exponential growth of amplitude. For example small disturbances q_D of money demand can grow as exponent (Appendix) in time as:

$$q_D = \cos(\mathbf{k} \cdot \mathbf{x} - \omega t) \exp(\gamma t)$$

$$\gamma^2 = \frac{k^2}{4a} (b + \sqrt{-4ad}) > 0 \quad ; \quad \omega^2 = \frac{k^2}{4a} (b + \sqrt{-4ad}) - \frac{bk^2}{2a}$$

For $\gamma > 0$ the solution will grow up and for $\gamma < 0$ will dissipate.

Equations (11) admit solutions (Appendix) that grow up in direction, defined by vector \mathbf{p} :

$$q_D = \cos(\mathbf{k} \cdot \mathbf{x} - \omega t) \exp(\mathbf{p} \cdot \mathbf{x})$$

$$\omega^2 = \frac{2d}{b} (k^2 - p^2) \quad ; \quad \mathbf{p} = \mathbf{k} (\sqrt{\varepsilon^2 + 1} - \varepsilon)$$

These samples demonstrate possible existence of exponential amplification of small financial density disturbances in the simplest models of two conjugate interacting e-fluids and confirm that modeling on e-space can describe a wide range of wave processes.

Conclusion

Complexity of finance processes requires relevant methods and models. Most methods of theoretical physics are based on the space-time notion. To boost methods of financial modeling we introduce economic space notion as generalization of risk ratings.

Risk ratings can be treated as coordinates of economic agents on discrete economic space. We propose that generalization of risk ratings methodologies can establish risk ratings measurements of n different risks on continuous economic space R^n . Financial and economic risks should be treated as important and necessary drivers of financial and economic evolution. It appears reasonable that suitable economic space should follow current financial conditions that are determined by set of most valuable risks and define financial dynamics. Economic space can have different representations for different financial conditions and that add complexity to description of financial dynamics. There are no ways to establish determined macroeconomic and financial forecasts as random nature of risks growth and decline insert permanent uncertainty into financial evolution. Long terms financial forecasts require development of evolution model on initial economic space and assumptions on future valuable risk configurations that will define final economic space representation in projected time term.

Definition of economic space requires selection of main risks. Risk benchmarking is a separate tough problem. Possibility to measure and select most valuable risks should establish procedure to validate the initial and target set of risks and to prove or disprove initial model assumptions. It will allow compare predictions of economic and financial models with observations and will help outline causes of disagreement between theoretical predictions and observed reality.

Economic space notion outlines complexity of financial processes and gives base for usage of theoretical physics methods and models. Differences between finance and physics leave no hopes for direct application of mathematical physics methods and models. We believe that finance modeling on economic space may help establish suitable forecasting and improve crises predictions and management.

Our treatments of option pricing of economic agents on n -dimensional e-space R^n permit derive extension for BSM equation and outline additional difficulties for option pricing modeling. These difficulties concern possible changes of main risks that determine the current economic space axes. Random dynamics of main risks during time to expiration means that BSM equations (1,6) should be transformed into other ones on economic space with different axes. That effect might explain differences between predicted and observed option price dynamics. Correct description of these effects might rise up the accuracy for the option pricing.

Nevertheless finance and physics are completely different systems it is reasonable study economic and financial models similar to physical approximations like kinetics and hydrodynamics. Derivation of economic and financial wave equations for the simplest models of interaction between Money Demand and Interest Rate opens a way for further investigation of financial wave processes. Wave theories play core role in physics and might help for financial modeling as well.

Economic space notion outlines the internal complexity of financial and economic systems and requires appropriate econometric foundations. The main problems concern the observation and the choice of most valuable risks, measurement of economic agents distributions on economic space. At present, there are no risk ratings methodologies that allow distribute economic agents on R^n . To establish economic space with one or two dimensions, one needs cooperative efforts of Central Banks, Rating Agencies, Economic and Finance Research Communities, Regulators, Statistical Bureaus, Businesses, etc., etc. Our work is only first step on that long way.

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Appendix

Let take the q_D in the form:

$$q_D = \cos(\mathbf{k} \cdot \mathbf{x} - \omega t) \exp(\gamma t + \mathbf{p} \cdot \mathbf{x}) \quad (\text{A1})$$

Here $\mathbf{k} \cdot \mathbf{x}$ denote scalar product of two vectors \mathbf{k} and \mathbf{x} . Let denote

$$a = 1 - \alpha_D \alpha_C > 1 ; b = \alpha_C \beta_D + \alpha_D \beta_C < 0 ; d = \beta_D \beta_C < 0$$

For q_D as (A1) equation (11) becomes a system of two equations:

$$a[(\gamma^2 - \omega^2)^2 - 4\gamma^2 \omega^2] + b[(p^2 - k^2)(\gamma^2 - \omega^2) + 4\gamma \omega \mathbf{k} \cdot \mathbf{p}] - d[(p^2 - k^2)^2 - 4(\mathbf{k} \cdot \mathbf{p})^2] = 0 \quad (\text{A2})$$

$$4a\omega\gamma(\gamma^2 - \omega^2) + b[2\omega\gamma(p^2 - k^2) - 2(\gamma^2 - \omega^2)\mathbf{k} \cdot \mathbf{p}] + 4d(p^2 - k^2)\mathbf{k} \cdot \mathbf{p} = 0$$

For simplicity let study two cases.

Case 1. Let $\mathbf{p}=0$

Then system (A2) takes form:

$$a[(\gamma^2 - \omega^2)^2 - 4\gamma^2 \omega^2] - bk^2(\gamma^2 - \omega^2) - dk^4 = 0$$

$$4a\omega\gamma(\gamma^2 - \omega^2) - 2b\omega\gamma k^2 = 0$$

Hence, from the second equation, $a > 1$, $b < 0$:

$$\omega^2 = \gamma^2 - \frac{bk^2}{2a}$$

and first equation takes form

$$\frac{b^2 k^4}{4a} - 4a\gamma^2 \omega^2 - \frac{b^2 k^4}{2a} - dk^4 = 0$$

Thus

$$\frac{b^2 k^4}{4a} - 4a\gamma^2 \omega^2 = -\frac{b^2 k^4}{2a} - dk^4 = 0 \quad ; \quad \gamma^2 \omega^2 = -\frac{k^4}{4a} \left(\frac{b^2}{4a} + d \right) > 0$$

$$b^2 + 4ad < 0 \quad \text{or} \quad (\alpha_D \beta_C - \alpha_C \beta_D)^2 + 4\beta_D \beta_C < 0 \quad (\text{A3})$$

Condition (A3) means that $c^2_{l,2}$ (13) of equations (11) become complex numbers.

$$\gamma^4 - \frac{bk^2}{2a} \gamma^2 + \frac{k^4(b^2 + 4ad)}{16a^2} = 0 \quad : \quad \gamma^2_{1,2} = \frac{k^2}{4a} (b \pm \sqrt{-4ad})$$

Thus for condition (15) obtain

$$\gamma^2 = \frac{k^2}{4a} (b + \sqrt{-4ad}) > 0 \quad ; \quad \omega^2 = \frac{k^2}{4a} (b + \sqrt{-4ad}) - \frac{bk^2}{2a}$$

For $\gamma > 0$ amplitude of solution of equation (11) in form (A1) grow up as $\exp(\gamma t)$. Thus wave propagation of small disturbances of economic spatial densities for two conjugate e-fluids model can go along with exponential growth of amplitude of disturbances in time. Exponential growth of money demand perturbations may reflect crisis trends.

Case 2. $\gamma = 0$.

Then system (A2) takes form:

$$\begin{aligned} a\omega^4 - b\omega^2(p^2 - k^2) - d[(p^2 - k^2)^2 - 4(\mathbf{k} \cdot \mathbf{p})^2] &= 0 \\ 2b\omega^2 \mathbf{k} \cdot \mathbf{p} + 4d(p^2 - k^2) \mathbf{k} \cdot \mathbf{p} &= 0 \end{aligned}$$

Hence from the second equation:

$$(k^2 - p^2) = \frac{b}{2d} \omega^2 > 0 \quad ; \quad k^2 > p^2$$

The first equation takes form:

$$a\omega^4 + \frac{b^2}{4d} \omega^4 + 4d(\mathbf{k} \cdot \mathbf{p})^2 = 0 \quad ; \quad \left(a + \frac{b^2}{4d}\right) \omega^4 = -4d(\mathbf{k} \cdot \mathbf{p})^2 > 0$$

For condition (A3) obtain

$$\omega^4 = -\frac{16d^2}{4ad + b^2} (\mathbf{k} \cdot \mathbf{p})^2 > 0$$

Let define θ as angle between vectors \mathbf{k} and \mathbf{p}

$$\mathbf{k} \cdot \mathbf{p} = kpcos(\theta) \quad ; \quad \varepsilon = \frac{|b| |\cos(\theta)|}{\sqrt{-(4ad+b^2)}}$$

Absolute values of vector \mathbf{p} :

$$p = k(\sqrt{\varepsilon^2 + 1} - \varepsilon)$$

Amplitude of the wave (A1) can exponentially grow up as $\exp(\mathbf{p} \cdot \mathbf{x})$. Vector \mathbf{p} belongs to cone that has angle θ with wave vector \mathbf{k} that define direction of wave propagation.

References

- Asada, T., & Ishikawa, T. (2007). *Time and Space in Economics*. Springer Japan.
- BIS. (2011). *Range of Methodologies for Risk and Performance Alignment of Remuneration*. Bank for International Settlements. <http://www.bis.org/publ/bcbs194.pdf> , accessed: March 20, 2015.
- BIS. (2014). *Foundations of the standardized approach for measuring counterparty credit risk exposure*. Bank for International Settlements. <http://www.bis.org/publ/bcbs279.pdf>, accessed: Feb. 23, 2015.
- Black, F., & Scholes, M. (1973). The pricing of options and corporate liabilities. *Journal of Political Economy*, 81, 637–659.
- DBRS. (2015). *Industry Study, 2014 DBRS Structured Finance Rating Transition and Default*. <http://www.dbrs.com/research/278498/2014-dbrs-structured-finance-rating-transition-and-default-study.pdf>., accessed March 17, 2015
- Fitch. (2010). *Structured Finance. Global Rating Criteria for Structured Finance CDOs*. https://www.fitchratings.co.jp/ja/images/RC_20101015_Global%20Rtg%20Criteria%20for%20SF%20CDOs_EN.pdf., accessed March 3, 2015.
- Fujita, M. (2010). The Evolution Of Spatial Economics: From Thünen To The New Economic Geography. *The Japanese Economic Review* 61, 1-32.
- Hull, J.C. (2009). *Options, Futures and other Derivatives*. (7th.ed., pp. 287-288), Pearson Prentice Hall, New Jersey, USA.
- Judd, K., & Tesfatsion, L.,(Eds). (2005). *Handbook of Computational Economics, Vol. 2: Agent-Based Computational Economics*, Elsevier, North-Holland.
- Landau, L.D., & Lifshitz, E.M. (1981). *Physical Kinetics*. Pergamon Press Ltd., NY.
- Landau, L.D., & Lifshitz, E.M. (1987). *Fluid Mechanics*. Pergamon Press Ltd., NY.
- Merton, R. (1973). Theory of Rational Option Pricing. *The Bell J. of Economic and Management Sci.*, 4, (1), 141-183.
- Merton, R. (1998). Application of Option Pricing Theory: Twenty Five Years Later. *The American Economic Review*, 88, (3), 323-349.
- Moody's. (2007). *Introducing Moody's Credit Transition Model*. 1-26, <http://www.moodyanalytics.com/~media/Brochures/Credit-Research-Risk-Measurement/Quantative-Insight/Credit-Transition-Model/Introductory-Article-Credit-Transition-Model.pdf>., accessed March 12, 2015
- Perroux, F. (1950). *Economic Space: Theory and Applications*. *The Quarterly Journal of Economics*, 64, 89-104.
- S&P. (2012). *Default, Transition, and Recovery: 2011 Annual U.S. Corporate Default Study And Rating Transitions.*, S&P. http://www.standardandpoors.com/spf/upload/Ratings_EMEA/2012-03-23_2011AnnualUSCorpDefaultStudy.pdf ., accessed March 21, 2015.

LONG – TERM SUSTAINABILITY OF PORTFOLIO INVESTMENTS – GENDER PERSPECTIVE: AN OVERVIEW STUDY

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Abstract: *Financial market is the place where a supply of financial products and a demand for financial products are crossing. Financial institutions are standing on the supply side, and potential client on the demand side. The mentioned crossing is seen in a financial portfolio. The client is purchasing a product for some purpose (insurance, mortgage, etc.), the financial institution or a financial advisor/broker should be helpful in the phase of creating a client's portfolio. By offering the product to client it is necessary to know his/her needs first. In this article we assume that the needs analysis is the inevitable part of a client's portfolio building process. Firstly to reach the concept of long – term sustainability and secondly that this process should be done by taking into account possible gender based differences.*

Keywords: *Gender, Long – term sustainability, Portfolio Investments, Risk*

Introduction

Financial institutions are offering new innovated products in a very short time period, so the customer can easily lose track if he/she is not following every change. The question is if there can be a long-term sustainable portfolio build without information about client's needs and goals. Another question is, if we can use one framework to building portfolio across the gender. In this article we consider that the needs analysis is the inevitable part of a client's portfolio building process, if we want to reach the concept of long – term sustainability. We will observe how it is possible to reach long – term financial portfolio and which are the most significant steps in this process. Secondly we will observe if this process should be done by taking into account gender based differences. We focus on risk, stability, flexibility and we will try to find an answer on the question, if there are some differences in building portfolio between men and women.

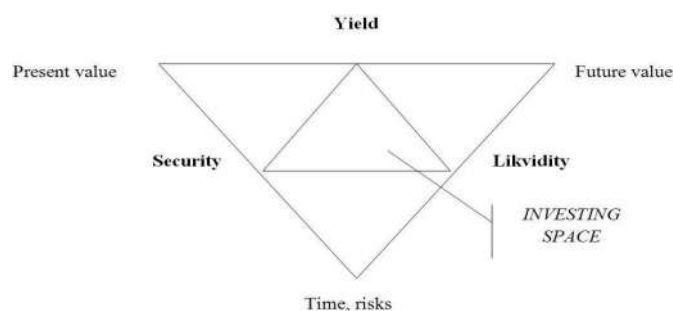
Financial portfolio

The term portfolio is generally used for a collection or a package of objects with conjoint features. Saying slightly differently, every restaurant can call their soups in menu as “soup portfolio” (Cocco, 2005; Bucciol & Miniaci, 2015).

Label “portfolio” is best known with connection to financial products. These portfolios we will call financial portfolios. The financial portfolio of individual client is a collection of financial products owned by the client. We consider financial product such as mortgage, investments, mutual funds etc. Definition of financial portfolio: *“Financial portfolio is a collection of different investments, which is composed by some purposes. The main purposes of the financial*

portfolio is eliminating risks and at the same time finding optimal ratio between yield and risk”(Chovancová & Žofčák, 2013, p. 20, Lewellen et al., 1977, p. 300).

The risk and yield are two of three key variables. The third is liquidity - an ability of financial assets or product transform to money. The most liquidity is of course money, the least for example an assets of some firm. Risk, yield, liquidity and their each to other relations create the thing called an investment triangle. The investment triangle helps us to understand the gold investment rule. Komorník et al. (2011, p. 21) define the gold rule of investing as: *“We have to evaluate all three variables together. There are no investment instruments that can reach a maximum value in all three variables. There is only a way to choose optimal ratio between these three variables”* (Picture 1).



Picture 1: Investment triangle

Source: Komorník et al., 2011, p. 21

The term financial product stands for current personal account, term deposits and deposits, loans, mortgages, mutual fund, pension funds and other financial instruments. Each one of these products have its own parameters. The other significant factor is conformity with our goals and needs. The products in the financial portfolio should be tailored to the clients' goals and needs. Needs and goals are on first sight two different notions, but they are related to each other and it is important to know as much information about client's goals and needs. There is often the question of rationality in finding the optimal portfolio while: *“Rational investors make periodic contributions and withdrawals from their investment portfolios, rebalance their portfolios, and trade to minimize their taxes. Those possessed of superior information may trade speculatively, though rational speculative traders will generally not choose to trade with each other”* (Barber & Odean, 1999, p. 47).

Building client's financial portfolio – gender perspective

“The building of the financial portfolio is a part of process called a financial planning. The financial planning is process of managing financial resources to achieve financial goals and personal economic satisfaction” (Kapoor et al., 2011, p. 2).

“The building of a financial portfolio is planned, goal oriented activity of finding an optimal combination of financial products or parts of financial products. The result of this activity is maximizing profit, eliminating or at least minimizing risks, achieving client's goals and covering his/her needs at the same time” (Ryan, 2009, p. 7).

There is a common believe, that women are less risky investors, more deliberative and more stable investors than men. Based on the finding form experts and authors we will be focused on if there is need to have specific steps of process of building long – term sustainability portfolio from the gender differences point of view. This is supported by Charness & Gneezy

(2012) they suggest that women tend to be more risk averse in financial investment to risky assets than men do, so the investment behaviour is different among the two groups of potential clients. Women are investing less, and so they appear to be more financially risk averse than men. And they refer, that more information about the participants should be recorded. The study by Barber & Odean (1999, 2001) on overconfidence is consistent with the models of overconfidence. The prediction of the models is that men are more overconfident than women and trade more than women (measured by monthly portfolio turnover). In the common stock portfolios women tend to hold less risky positions, and men are decreasing their portfolio returns by trading more than women do. Their finding also suggest that age and marital status are influencing the willingness of holding more volatile portfolios. Investment decisions are influenced by spouse and are therefore reducing gender differences. They also suggest that: *“however, gender differences in portfolio risk may be due to differences in risk tolerance rather than (or in addition to) differences in overconfidence”* (Barber & Odean, 2001, p. 266). Female participant in a study by Vanguard skew towards less-concentrated risk, which means that women are more likely to hold balanced investment allocations rather to employer stock. So their equity exposure is on par with men (Vanguard, 2015). Ozmete & Hira (2011), Kaur & Vohra (2012) are focusing and explaining how behaviour theories or models can be applied on the financial behaviour. The psychological and sociological theories or models are dealing with the risk averseness of women by investing or selling investments as with their socialisation (can be seen in gender specific roles) and the effect on their decision making. According to findings in analyses of Martenson (2008), in aspects of financial investments there can be several gender specific stereotypes seen. Women feel less certain in their decisions, are not willing to take higher risk, are less involved in the stock market, and they are not monitoring the stock market like men do and have lower subjective knowledge of stock market than men have. Women own mutual funds over a shorter time than men and women think that it is difficult and energy demanding to use information about stock market and make own evaluations about it. Women are less profit oriented and have less knowledge to interpret annual reports. On the other hand, if there is a categorisation of respondents/consumers (in elaboration of information) in groups, by comparison women and men in these groups are not so different. In the group of high elaboration of information women and men think, feel and act the same. As Martenson (2008, p. 80) suggests: *“There are however many more knowledgeable and motivated men than women”*. Gender differences in mutual fund investment were found by Dwyer, et.al (2002) the findings of risk taking suggest that the decision in taking more or less risk is related with financial investment knowledge rather than with client’s gender. Our analyses of the Eurobarometer 76.1 data (European Commission, 2014) suggest that a minor correlation between gender and shares of bonds (by purchasing, information about the product, product comparison, and product recommendation) can be seen.

At this point it is necessary to take gender perspective into account in building financial portfolio. It is more complicated if the portfolio have to make some level of profit but client is a risk – aversion investor and prefers the guaranteed profit products. In this case the process of building financial portfolio is more time-consuming a portfolio needs to be more structured.

The Filbeck et al. (2005) study shows a link between personality type (measured by Myers-BriggsType Indicator – MBTI) and individual risk tolerance (Expected utility theory – EUT), but this finding are not linked to the well know introversion or extraversion preferences. Tversky & Kahneman (1992, p. 302) are suggesting that *“in expected utility theory, risk aversion and risk seeking are determined solely by the utility function”*. Booth & Nolen (2012) conclude the findings in their survey as that gender differences might refer more to social learning than to gender specific traits (specially by making choices under uncertainty), and that the methodology of the experiment is crucial for finding out the gender differences in risk

aversion. This is supported by Schubert et al. (1999) study in compared to men, female from the study do not make less risky financial choices. Their (female's) risk propensity is according to the data strongly depending on the decision frame. The data also show that the gender specific propensity arise if the participants are dealing with abstract gambles. By choosing an investment or insurance no differences prior risk were found. Authors conclude, that the risky financial decisions are contextual, and also the risk attitudes of women may be just a prejudice.

Recent survey from Finland by Halko et al. (2012) shows that women are still more risk averse than men even by women which are finance professional and wealthy private banking customers. Results from this survey mentioned by the authors are of importance for the finance services industry in several ways. Especially in the field of financial planning by understanding the individual clients risk aversion and therefore offering investment advice in assets more suitable (tailored) for the client. This can be seen as an opportunity for the financial institutions to acquire competitive advantage on the market. Montford & Goldsmith (2015) according to their findings women are more risk averse by investing to by their lower financial self-efficacy feelings. But if they are more confident with their ability to make the decision with finance they chose similar investment options than men. Enhancing women's feelings of their financial efficacy by an agent can be more effective than encouraging them to make riskier investment decision. This research findings are consistent with Badunenko et al. (2009, p. 23): *“that financial advice should be provided in accordance with individual risk preferences of individuals rather than to be based on the stereotypical beliefs about behaviour of a “typical” man or woman”*.

In the light of these findings there is a great opportunity in the field of financial consulting for women. This advice would give women confidence to make more knowledgeable and motivated financial decision. In the “long run”, this can be a tool to break some of the gender stereotype in which women are seen as less oriented on financial issues.

The activity of building is following by same previous down streaming steps. Janáč (2008) called these steps in his publication like: *„There are some down streaming to each other related steps, which are going before the activity of building. The main from them are four steps such as identifying the goals, delineation future stage, analysing of present stage, which covers need analysis.”*

The process of building the portfolio is a step-by-step process. The first step is to determine future position (dreams, goals) and then analyse present position – financial possibilities which can use to achieve the future position. The next step is to suggest possible alternatives how to reach the future stage. The process of building the portfolio can be compared to building a house.

Main steps of the process of building stable financial planning are (Kapoor et al., 2011, p. 2):

- Detection and analysis of current needs, the state of the budget and the existing financial portfolio.
- Planning the future state, financial goals and needs.
- Development of alternative solutions and selection of appropriate alternatives.
- Regular monitoring and control.

Detection and analysis of current needs, the state of the budget and existing financial portfolio

This phase is collecting data about present financial plan of the client. There is an analysis of client's existing portfolio, revenues, expenses, liabilities, encumbrances. The goal of the observation is to find an optimal solution to achieve client's goals without ruined the existing

portfolio. Key information for this phase is information about an every step which client undertook to build the existing portfolio and about his/her life. All information is sorted to three basic individual groups:

- Current state of household budget
- Current needs and goals
- Existing financial portfolio

For analysis is relevant quantity and also quality of obtained information. Banks and insurance companies tend to not make deep financial analysis of the client's current situation. Specific needs of a client are not always fitting into the offered portfolio, which are created by banks or insurance companies, and employees of this institution are offering these portfolios to client as they are.

According to the findings (Martenson, 2008; Halko et al., 2012; Barber & Odean, 1999, 2001) women are less gullible to risky investments and tend to investments with guaranteed returns. Despite this fact, it does not mean that they are somehow protected from the risks experienced by men and therefore their portfolios need to be flexible and stable.

Planning the future state, financial goals and needs

The financial goal means results, which the client wants to achieve (e.g. buying a house or car) by saving certain amount of money or achieve the state of a financial independence (Joehnk et al., 2011, p. 8). This process is called planning. Many authors and specialist wanted to improve process of planning. The result of that are theories and procedures of planning, which are applicable to any planning. These theories are corresponded in the determining a target as a first step. The target has to have specific characteristics, which were summarized under the acronym SMART. Every letter of this acronym expresses one feature of the target. Let's see what is hidden behind these letters: S = Specific, M = Measurable, A = Attainable or Achievable, R= Realistic, T= Timely. The target has to have timeline and if the target is long – term, it has to be divided in shorter targets and they also have to have timelines (David, 2009, p. 166). Reaching personal or financial goals is connected with some forms of specific risks, which are in relation with these goals. Those risks should be eliminated. The elimination of the risks requires paying money so it is necessary to integrate these needs into the financial plan.

Household budget can be defined such as allocation and distribution of specific sums of money (Xu et al., 2003). Determination of financial goals is a simple process in which the client draws up as much detail about the desired target as he can (Fowles, 2008, p. 6).

As mentioned above men trade more actively than women (Barber & Odean, 1999, 2001), this should be considered in the client's portfolio.

Development of alternative solutions and selection of appropriate alternatives

This phase is a process of finding such as product; combination of products or combination parts of products which cover best client's identified needs and goals. Criteria of choosing is adjusted on the basis of data from the analysis. Combination of products or combinations of parts of products are used because ideal product does not exist and one product does also not cover all client's needs and goals. The target of this phase is to find an optimal combination, which covers client's need and realize it. The previous phases provide us enough information to solve client's situation. But permissive optimal outputs can more than two. It means there are more right solutions. Then we have to choose one, so we have to make a decision. When evaluating alternatives we can follow several models. For most practical model can be considered a viable alternative model of allocating scales to each criterion (Fotr et al., 2010. p. 175 – 196). A manner similar procedure is applied in the evaluation of alternatives to the high

number of variables. We first determine priority variables and assign them the highest weight. Then put together a table of alternatives. Then we will identify which alternative meets the variables on scale from 1 to 10 (10 is better). If a particular variable will occur at some alternative we assign value, which is weight multiplied by value from the scale. The sum of all the numbers assigned to the alternatives and the best occurred one will be the one with the highest numerical value. In case that the option won with tight gap and we are confident of the outcome, the solution is to repeat the whole process with added new criteria or reassessment weights of individual criteria. The same procedure can also choose when we are evaluating alternative products to the portfolio. We must take into account the suitability or degree of coverage needs, which has the top priority, then for example the price, stability of company, time aspect, risk, flexibility and liquidity.

Regular monitoring and control

Control and modification is a final phase of identification and selection of the appropriate solutions to the client's expected goals and needs and building portfolio. It is necessary to check and update financial portfolio at least once a year (Kapoor et al., 2012). This requires to periodically review changes in the situation of the client and environment and verify if the changes caused that the portfolio is outdated. The regular monitoring can prevent the occurrence of certain situations. A task of controlling is timely detecting deviations in the controlled process, which are representing the difference between the plan and its implementation. These deviations can be negative or positive. It is certainly necessary to carry out their analysis and then based on the conclusion adopted containing solutions and subsequently also applied them. Control does not closely understand just as some checking activity or as a comparison with the planned and final result (Greenberg et al., 2005).

The role of needs analysis in the context of building a client's financial portfolio

This section explains the reasons why the analysis of needs and goals is so crucial. There are model examples for better imagination. Bank designed portfolio is not objectively and offered portfolio is not optimized for a particular client but for the average of the target group. The reason why this happens is that people are unfortunately not educated in the field of financing to being aware of the fact that the analysis of needs and objectives is essential part of financial planning. The proofs about low level of a financial literacy of the population of the Slovak Republic are researches of Slovak bank association. The result from year 2007 was 0.56, what represents average knowledge of personal finance issues. The last observation was realised by Foundation Partners with cooperation with Focus Agency in 2013 and respondents achieved results 0.625 (Partnersgroup, 2012, 2013). As mentioned above the decision in taking more or less risk is related with financial investment knowledge rather than with client's gender (Martenson, 2008; Dwyer et al., 2002), personality (Filbeck et al., 2005), financial self-esteem (Montford & Goldsmith, 2015) and overconfidence or marital status (Barber & Odean, 1999, 2001). There is also evidence that emotions are influencing via the visceral factors (Loewenstein, 2000). Analysis of needs and objectives is important from the perspective of optimization, exploring possibilities important for the final rational decisions. The result of the whole procedure creation of a portfolio should be rational, specific, measurable, attainable, realistic and time-bound target. A client has to realize the imprudence and the impact of certain decisions in order to achieve its objectives.

Without the needs analysis we are not able to shift to the next step of building portfolio, because the role of analysis is to obtain data (information) which are necessary for the next phases such as planning, developing alternatives, selection appropriate alternative. Thorough analysis is a necessary prerequisite for the building the portfolio, which can avoid the purpose of itself and meets client's objective in due time. The most important starting points for the analysis are information about the clients, their situation, their needs and goals, because only when we know where we want to get, when we want to be there and what are possible threats on this way, we are able to planned to achieve the milestone in specific time and eliminating the possible situation, that can avoid us to achieve that milestone.

Conclusion

We are not able to create a portfolio which has to achieve all client's goals and needs without a congruent analysis. The analysis of goals and needs is a necessary first step to build an optimal client's financial portfolio. Banks have a huge amount of clients, so it is not surprising that they cannot make pre-prepared product portfolios. With the pre-prepared product portfolios, they simply cannot provide individual and careful approach to client. There are also some subjects that provide individual and careful approach to client (financial advisors and financial agents). As we mentioned in introduction, this is the first draft which primary observe the portfolio investments, needs analysis and the possibility of gender differences in investment decisions. This field of our study is so extensive that future observation is needed and has the potential to be implemented in many studies. At this point we can highly recommend by building financial portfolio to take into account that women tend to be less self-confident and need more information by financial decisions and that men are overconfident. Besides this we can also recommend to take time to know the client and try to adjust his/hers personality closer.

References

- Badunenko, O., Barasinska, N., & Schäfer, D. (2009). Risk Attitudes and Investment Decisions across European Countries-Are Women More Conservative Investors than Men? *SOEPpapers on Multidisciplinary Panel Data Research*, (224), 41.
- Barber, B. M., & Odean, T. (1999). The courage of misguided convictions: the trading behavior of individual investors. *Financial Analysts Journal*, 55(6), 41–55.
- Barber, B. M., & Odean, T. (2001). Boys Will be Boys: Gender, Overconfidence, and Common Stock Investment. *The Quarterly Journal of Economics*, 116(1), 261–292.
- Booth, A. L., & Nolen, P. (2012). Gender differences in risk behaviour: does nurture matter?. *The Economic Journal*, 122(558), F56–F78.
- Buccioli, A., & Miniaci, R. (2015). Household Portfolio Risk. *Review of Finance*, 19(2), 739–783.
- Cocco, J. F. (2005). Portfolio Choice in the Presence of Housing. *Review of Financial Studies*, 18(2), 535–567.
- David, F. R. (2009). *Strategic management: concepts and cases*. Upper Saddle River, N.J.: Pearson Education.
- Dwyer, P. D., Gilkeson, J. H., & List, J. A. (2002). Gender differences in revealed risk taking: evidence from mutual fund investors. *Economics Letters*, 76(2), 151–158.
- European Commission. (2014). Eurobarometer 76.1 (2011). GESIS Data Archive. Retrieved September 10, 2015, from <http://dx.doi.org/10.4232/1.11847>
- Filbeck, G., Hatfield, P., & Horvath, P. (2005). Risk aversion and personality type. *The Journal of Behavioral Finance*, 6(4), 170–180.
- Fotr, J., & Švecová, L. (2010). *Manažerské rozhodování: postupy, metody a nástroje*. Praha: Ekopress.
- Fowles, D. (2008). *Everything Personal Finance in Your 20s and 30s: Erase your debt, personalize your budget, and plan now to secure your future* (2 edition.). Avon, Mass.: Adams Media.
- Greenberg, A., Hjalmtysson, G., Maltz, D. A., Myers, A., Rexford, J., Xie, G., Yan, H., et al. (2005). A Clean Slate 4D Approach to Network Control and Management. *SIGCOMM Comput. Commun. Rev.*, 35(5), 41–54.

- Halko, M.-L., Kaustia, M., & Alanko, E. (2012). The gender effect in risky asset holdings. *Journal of Economic Behavior & Organization*, Gender Differences in Risk Aversion and Competition, 83(1), 66–81.
- Charness, G., & Gneezy, U. (2012). Strong Evidence for Gender Differences in Risk Taking. *Journal of Economic Behavior & Organization*, Gender Differences in Risk Aversion and Competition, 83(1), 50–58.
- Chovancová, B., & Žofčák, S. (2012). *Kolektívne investovanie*. Bratislava: Iura Edition.
- Janáč, J. (2008). Finančná rezerva ako súčasť finančného portfólia klienta. *Súčasný trendy a smery v manažmente organizácií* (pp. 62–65). Presented at the Vedecká konferencia doktorandov, Bratislava: Univerzita Komenského Fakulta managementu.
- Joehnk, M. D., Billingsley, R. S., & Gitman, L. J. (2011). *Planning your personal finances* (12th ed.). Australia: South-Western Cengage Learning.
- Kapoor, J. R., Dlabay, L. R., & Hughes, R. J. (2011). *Personal finance*. New York; London: McGraw-Hill Higher Education; McGraw-Hill [distributor].
- Kaur, M., & Vohra, T. (2012). Women and Stock Market Participation A Review of Empirical Evidences. *Management and Labour Studies*, 37(4), 283–293.
- Komorník, J., Majerčáková, D., & Husovská, M. (2011). *Finančný manažment*. Bratislava: Kartprint.
- Kroutil, J. (2006). *Domáci rozpočet*. Brno: Computer Press.
- Lewellen, W. G., Lease, R. C., & Schlarbaum, G. G. (1977). Patterns of Investment Strategy and Behavior Among Individual Investors. *The Journal of Business*, 50(3), 296–333.
- Loewenstein, G. (2000). Emotions in Economic Theory and Economic Behavior. *The American Economic Review*, 90(2), 426–432.
- Martenson, R. (2008). Are men better investors than women? Gender differences in mutual fund and pension investments. *Journal of Financial Services Marketing*, 13(1), 72–81.
- Montford, W., & Goldsmith, R. E. (2015). How gender and financial self-efficacy influence investment risk taking: Investment risk taking. *International Journal of Consumer Studies*, n/a–n/a.
- Ozmete, E., & Hira, T. (2011). Conceptual Analysis of Behavioral Theories/Models: Application to Financial Behavior. *European Journal of Social Sciences*, 18(3), 386–404.
- Partnersgroup. (2012, September 7). Viac ako tretina Slovákov má nízku finančnú gramotnosť. Retrieved from <https://www.partnersgroup.sk/dve-tretiny-slovakov-ziju-na-hranici-financneho-kolapsu-domacnosti>
- Partnersgroup. (2013, September 6). Dve tretiny Slovákov žijú na hranici finančného kolapsu domácnosti. Retrieved from <https://www.partnersgroup.sk/dve-tretiny-slovakov-ziju-na-hranici-financneho-kolapsu-domacnosti>
- Ryan, J. S. (2009). *Managing Your Personal Finances*. Cengage Learning.
- Schubert, R., Brown, M., Gysler, M., & Brachinger, H. W. (1999). Financial Decision-Making: Are Women Really More Risk-Averse? *American Economic Review*, 89(2), 381–385.
- Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and uncertainty*, 5(4), 297–323.
- Vanguard. (2015). Vanguard Examines 401(k) Behavior/Outcome Gender Paradox [Press release]. Retrieved from https://pressroom.vanguard.com/content/press_release/Press_Release_Women_and_DC_pl
- Xu, K., Evans, D. B., Kawabata, K., Zeramardini, R., Klavus, J., & Murray, C. J. (2003). Household catastrophic health expenditure: a multicountry analysis. *The Lancet*, 362(9378), 111–117.

MODELS OF DETECTION OF MANIPULATED FINANCIAL STATEMENTS AS PART OF THE INTERNAL CONTROL SYSTEM OF THE ENTITY

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Abstract: *Accounting remains the main source of information about the company for most users of financial statements. At the same time, the creators and users of financial statements want to get the best quality and quantity of information as far as possible. Although users of financial statements are unable to obtain with absolute certainty statements that are true and fair, they need to know how much they can rely on financial statements. This paper deals with reducing the information asymmetry, especially on the part of users of financial statements. The paper analyses selected models of the detection of manipulated financial statements as a possibility to reduce the risk of accounting fraud and use as part of an internal control system of an entity or as a management tool for corporate governance or internal auditors. A risk analysis was performed on selected models; the Beneish model, the CFEBT model, the Jones Non discretionary Accruals model and selected bankruptcy models to detect accounting frauds in specific case studies of selected accounting unit.*

Keywords: *financial statements, fraud, fair and true view of accounting, detection of the risk of manipulating financial statements.*

Introduction

According to the Act on Accounting, accounting entities are obliged to keep the books in such a manner to ensure that the financial statement based on them gives a true and fair view of the subject of accounting and financial situation of the entity.

The urgency of the issue of distortion of the true and fair view of accounting is manifested by both the consequences of frauds of big dimensions and the frequency of activities of distortion of the data distributed to several areas in the major part of relatively small firms. The struggle against the so-called creative accounting, which is definitely beyond the true and fair view of accounting, assumes importance especially after the scandals of a number of prominent European and American firms, including national cases. Conditions for corruption, attempts to modify the tax liabilities or expediency are based on bookkeeping, even though it is only a tool for achieving the goal. All items of financial statements should be viewed truly and fairly, not only the profit and stock capital. The view is true when it reflects the real state of things. The term fairness describes the use of accounting methods. When these are applied in the right way we say that the view is not only true but also fair. There are various valuation methods, such as property valuation method or discounted cash flow method, and in principle each of the methods leads to a different result. It is obvious that in practice you can find purposeful manipulation. If you look closely at the issue of financial statement you can say that it is not only an accounting problem. This is especially true in the context of the harmonization of the national accounting systems. External auditors have to comply with legislative regulations. In

the Czech Republic, they are bound by the Act 93/2009 Coll., On Auditors, by the Code of Ethics and by international accounting standards and related regulations, including the internal regulations of the Czech Chamber of Auditors. The auditors are also obliged to evaluate the risk of accounting fraud in compliance with ISA 240 standard. On the other hand, decisions made by users on the basis of trust in the financial statements have been increasingly becoming a complicated problem. A wide range of financial indicators, rating and default models are available but these often provide conflicting results in comparison. In addition, methods of accounting data manipulation are becoming more and more original and imaginative and financial statements' creators use methods of creative accounting, designing ongoing transactions reflexes into the accounting statements. Similarly, the pressures of the market, the owners and the importance to finance necessary activities have been increasing.

The paper analyses the possibilities of detection of manipulated financial statements to reduce the risk of financial statement manipulation above true and fair accounting and the risk of accounting fraud. This paper presents a possible tool to use as part of an internal control system of an entity or as a management tool for corporate governance or internal auditors to reduce the information asymmetry, especially on the part of users of financial statements.

Methodology and Data

Managers often try to "adjust" the amount of reported profit in which they are financially involved, either towards the maximum or to extend their loss, and thus reach a higher profit in the following accounting periods. A bad management attempt to postpone the firm bankruptcy by distorting the real profit. Other possible reasons are investors' pressure or to conceal a financial risk of the respective company, an effort to be awarded subsidies or loans or an effort to reduce the tax liability. National research studies around the world such as (Brennan, McGrath, 2007) and (Jones, 2011) show that there is growing pressure in enforcing transparency and business ethics, which is true not only in publicly traded companies but also, for example, the misuse of subsidies by prominent entities, substantiation in accounting. Demands are namely placed on administrative bodies whose responsibility it is to guarantee the development of corporate culture and to promote shared values inside the company. You can also find more information in studies of Global Economic Crime Survey of the major auditing companies (Ernst&Young, 2012), (PriceWaterhouseCoopers, 2014), that draw attention to the growing problem of crime in the economy, which relate to fraud and corruption inside corporations. Chartered Institute of Management Accountants published a guidebook of risk management where the importance of issuing a plan of reactions after a fraud is detected and fraud prevention is highlighted. The guidebook also lists risk areas of fraud, its definition followed by case studies in reporting fraud. (CIMA, 2009)

Prevention and detection of accounting fraud is also engaged in Dave Tate's publication. Tate lists typical operation through which accounting fraud can be committed in 15 major risk areas such as liabilities, expenses, assets of increase, cost of goods sold or equity. (Tate, 2011).

Pamela S. Manton in the book called Using Analytics to Detect Possible Fraud provides case studies of four companies. The financial statements of the selected companies are subjected to examination via the individual tools and techniques appointed to examine accounting fraud. These case studies include the following techniques: liquidity ratios, profitability ratios, horizontal analysis, vertical analysis, cash realized form operations, analysing cash realized from operations to net income from operations, the Beneish M-Score model, Dechow-Dichev Accrual Quality, Sloan's Accruals, Jones Non discretionary Accruals, The Piotroski F-Score model, Lev-Thiagarajan's 12 Signals, Benford's Law, Z-score analysis, Correlation, Regressions analysis (Mantone, 2013).

Using technology to detect risk of manipulated financial statements, i.e. detection of the risk of accounting fraud, is not an easy decision and requires sophisticated professional qualification of people who analyse the financial statements. A wide range of ratios, bankruptcy and credibility models, which often provide users with conflicting results, often complicates decisions on the financial health of a company. Based on previous research of the possibility of detection of manipulated financial statements, the CFEBT model was designed and based on the hypothesis of a relationship between a loss and an increase in cash flow in the period of five years, i.e. whether the sum of their value in five years with minor variations lead to a similar result. After that the CFEBT model was tested to identify possible risks of manipulated financial statements in case studies of creative accounting for the conditions of Czech Accounting Standards. Furthermore, the results of case studies detecting risk of manipulated financial statements are compared with the results of the Beneish model that tests the risk within the US GAAP accounting system and IFRS (Drábková, 2013). At the same time, the CFEBT model has been studied on case studies of sample areas of creative accounting techniques and the intensity detection of risk of manipulated financial statements beyond true and fair view of accounting (Drábková, 2013). The CFEBT model was designed as one of the possible tests of detection of risk of accounting fraud as one of the auditors' tests in relation to the ISA 240 international standard on auditing. This paper analyses the different possibilities of detecting the manipulation of financial statements. It is also useful for owners and other users of financial statements for the detection of risk of manipulation of financial statements.

The risk analysis was performed on selected models: the Beneish model, the CFEBT model, the Jones Non discretionary Accruals model to detect accounting frauds in specific case studies of a selected accounting unit. In order to find answers to defined questions, a case study of an accounting entity was designed because the Altmann bankruptcy model had the same results for this selected unit in terms of Czech accounting standards (CAS) and International Financial Reporting Standards (IFRS). (Kubičková, 2011).

Results

The given entity was processed using a case study for the period of five years. Also, the entity had a profit of more than seven million CZK and does business in the service sector. The financial statements of the sample entity were subjected to an analysis of different models in order to evaluate the possibility of users (auditors) to detect the risk of accounting fraud and the manipulation of financial statements beyond the true and fair view of accounting.

The CFEBT model

The CFEBT model is defined as follows:

$$\frac{(\sum_{t=1}^5 [CF_{[t]}] - \sum_{t=1}^5 [EBT_{[t]}])}{(\sum_{t=1}^5 EBT_{[t]})} \times 100$$

Where:

CFIncrease of cash flow in period t

EBT Earnings before taxes in period t

If, there is a high risk of breaching a true and fair view of the accounts (Drábková, 2013).

Materiality significance ranges between 5 and 10%, taking into account the individual circumstances of the entity, as it did during the audit of financial statements by an external auditor.

Materiality of 5-10% is considered in this paper.

Table 1: EBT and CF Accrual in the years 2009- 2013

	2009	2010	2011	2012	2013	Sum
Σ VH (EBT) v mil. CZK	11560	10594	9160	8663	7161	47138
CF Accrual in mil.CZK+corporate income tax	3455	5925	8818	5870	3361	26799
CFEBT before modification (adjustment)	x	X	X	x	x	43%

Source: author

Table no. 1 contains the results of detecting manipulation risk in the financial statements through the CFEBT model in the accounting periods of 2009 to 2013. The CFEBT revealed high levels above the materiality in CF and EBT accruals in the years of 2009 to 2013. After calculating the value of the CFEBT model, it represents 43% of the value, thus well above consideration materiality 5-10.

The reasons for this discrepancy may be defined in the context of both the accounting system of International Financial Reporting Standards (IFRS) and Czech accounting standards (CAS) so that in the period:

Increased cash flow by maximizing the operating cash inflows or minimizing operating cash outflows.

Revenues were not reported to the created cash flow within the true and fair view of the accounts because it does not meet the criteria for revenue reporting or the CAS's, for example, because of advanced payments of unvoiced unrealized supply of work in progress. In case of manipulated accounts revenues were potentially undervalued for example by mispricing or by not-recognized orders (earning management).

The costs reported in the period are not reflected as expenses in particular, the reported cost of the risk to be borne by an entity in future periods as accounting allowances and reserves. The case of manipulated financial statements may potentially lead to overvaluation of costs using techniques of creative accounting using methods as Big bath, tax optimization, artificial costs without implementation costs or formally recognized contractual penalties (earning management).

To evaluate the risk of manipulation of financial statements beyond the true and fair presentation of financial accounting statements prepared in accordance with IFRS or CAS, it is necessary to analyse the development of risk items above the mentioned guidelines of the discrepancy between development and cash flow items reported in the financial statements. We will focus on the adjustment EBT in the analysis accounting items of the financial statements in the years 2009-2013.

Table 2: Modified CFEBT - analysis of significant items in the years 2009-2013

Adjusting the CFEBT for significant items of the financial period 2009 – 2013	
Σ EBT before adjustment	47138
<u>EBT modifications :</u>	
Costs: Σ depreciation + +	17732
Costs: changes in accounting provisions and reserves + + / - -	-829
Change in receivables of the period + - / - +	10295
Σ Increase (decrease) CF from investment activities - - / + +	-14867
Change in liabilities representing the costs + + / - -	-276
Change in stocks + - / - +	169
Change in received credits and loans + + / - -	-72
Σ Dividends paid - -	-34106
<u>Σ Modified EBT</u>	25184
Σ CF increases of the period	26799
CFEBT after modification	6 %

Source: author

In Table 2, the value of the modified CFEBT was significantly reduced from 43% to 6%, so it fulfils the considered materiality for fair and true view of financial statements. Increased risk of manipulation of financial statements for users of financial statements can therefore be considered beyond the true and fair view. Users of financial statements who need to decide about the credibility of financial statements in terms of CAS and IFRS can be advised to perform a more detailed analysis of risk items within the accounting and taking into account the specifics defined by the true and fair view of the accounts of the national accounting systems.

The Beneish model

The Beneish M-Score Model is a mathematical model based on eight variables. It was designed by Professor Beneish to evaluate the motivation to manipulate earnings.

The M-Score is calculated as follows:

$$M = -4.84 + 0.92 \cdot \text{DSRI} + 0.528 \cdot \text{GMI} + 0.404 \cdot \text{AQI} + 0.892 \cdot \text{SGI} + 0.115 \cdot \text{DEPI} - 0.172 \cdot \text{SGAI} + 4.679 \cdot \text{TATA} - 0.327 \cdot \text{LVGI}$$

Where:

DSRI - Days' sales in receivable index in the t and t-1 period.

GMI - Gross margin index as the ratio of gross margin and sales in the t and t-1.

AQI - Asset quality index.

SGI - Sales growth index.

DEPI - Depreciation index.

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SGAI - Sales and general and administrative expenses index.

LVGI - Leverage index of total debts to total assets in the t and t-1.

TATA - Total accruals to total assets in the t-period.

If $M > -2.22$, a firm is likely to be a manipulator (Beneish, 2001)

Table 3: Assessing the fraud indicators of the Beneish model

DERIVED VARIABLES	FRAUD INDICATOR	2014/ 2013	2013/ 2012	2012/ 2011	2011/ 2010	2010/ 2009	2009/ 2008
Other L/T Assets [TA- (CA+PPE)]		0	842	195	173	117	49
DSRI	$\geq 1,465$	1,026	1,226	1,104	0,322	0,922	1,889
GMI	$\geq 1,193$	-0,032	-23,819	0,993	1,019	0,998	0,993
AQI	$\geq 1,254$	0,000	4,397	1,135	1,485	2,357	0,922
SGI	$\geq 1,607$	1,049	0,899	0,962	0,921	0,947	0,918
DEPI	$\geq 1,077$	1,031	1,189	0,966	0,949	1,458	0,917
SGAI	$\leq 1,041$	0,945	0,980	1,008	0,991	0,907	1,110
Total Accruals/TA	$\geq 0,031$	-0,094	-0,098	-0,098	-0,097	-0,069	-0,166
LVGI	$\geq 1,111$	1,900	0,966	0,948	0,929	1,122	1,024

Source: author

In Table 3 are identified the fraud indicators of the Beneish model between years 2008 – 2014. The results can be assessed in details using the Beneish indices – fraud indicator (Bell, 2009):

1. Asset Quality Index (AQI): ≥ 1.254 Improper capitalization of expenses.
2. Days Sales in Receivable Index (DSRI): ≥ 1.465 Asset overstatement: inflating the value of receivables.
3. Depreciation Index (DEPI): ≥ 1.077 Earning manipulation: inflating the useful life of assets and increasing income
4. Gross Margin Index (GMI): ≥ 1.193 Economic difficulty.
5. Leverage Index (LVGI): ≥ 1.111 Earning manipulation.
6. Sales General & Administrative Expense Index (SGAI): ≤ 1.041 Earning manipulation.
7. Sales Growth Index (SGI): ≥ 1.607 Revenue recognition: fictitious revenue.
8. Total Accruals (TATA): ≥ 0.031 Revenue recognition

Although there are identified fraud indicators: Asset quality index (AQI) in years 2010, 2011, 2013 and Sales and general and administrative expenses index (SGI) in years 2009 – 2013 and Leverage index (LVGI) in 2014, overall result M-score evaluates low motivation to manipulate earnings.

Table 4: Assessing risks of manipulation of financial statements by the M-Score

	2009/ 2008	2010/ 2009	2011/ 2010	2012/ 2011	2013/ 2012	2014/ 2013
M-score (8 variable model)	-2,58	-2,35	-3,4	-2,81	-14,52	-4,08
If M > -2.22, likely is a manipulator	low risk	low risk	low risk	low risk	Low Risk	low risk

Source: author

Table 4 reveals the entity's results of the Beneish M-score between 2009 – 2014. In these years the M-scores were reported at the level of less than -2.22 and the years were assessed as low risk with an improbable earnings manipulation.

Jones Non-discretionary Accruals

The Jones' accruals model finds risk in manipulation with the financial statements in inconsistency of non-discretionary accruals in the development between different accounting periods. The Jones model of non-discretionary accruals suggests that if non-discretionary accruals decrease, discretionary accruals increase and vice versa. If these fluctuations are significant, they can indicate the manipulation of financial statements by some accruals violation and some kind of earning management.

Jones Non discretionary Accruals are defined as follows:

$$\left(\frac{1}{\text{Total Assets}} \right) + \left(\frac{\text{Revenue}_{\text{current year}} - \text{Revenue}_{\text{prior year}}}{\text{Total assets}_{\text{current year}}} \right) + \left(\frac{\text{Property, plant, equipment, gross}_{\text{current year}}}{\text{Total assets}_{\text{prior year}}} \right)$$

(Mantone, 2013)

Table 5: Assessing the risks of manipulation of financial statements by Jones' Non discretionary Accruals

Accounting item	2009	2010	2011	2012	2013
Total assets	32871	3297	33158	3294	32351
Revenue	30417	28820	26549	25533	25140
Property, plant, equipment	11519	12098	11792	11121	10323
Jones' analysis	x	-0,02958	-0,05273	-0,29576	96,44417
Result		low risk	low risk	low risk	high risk

Source: author

Table 5 shows the results of Jones' Non-discretionary Accruals. The low risk of the manipulation of financial statements are indicated in years 2009, 2010, 2011 and 2012. The high risk of fluctuation of discretionary expenditure is identified only in year 2013. It was caused by the increase in total assets of about 29,057 mil. CZK and merger of the other business corporations.

Discussion and Conclusions

These detailed tests can be performed by a professionally qualified user of accounts who wants to decide on the development of the company's financial health, as part of the introduction of an anti-fraud program into their internal control systems based on the submitted financial statements. The group of professionally qualified users includes internal or external auditors, owners, those charged with governance (Corporate Governance) or stakeholders of public administration and control offices. Information about the risk of manipulation of financial statements may not only improve the effectiveness of internal control systems of the subject, but also reduce the information asymmetry between owners and those charged with the management of an enterprise.

In addition, the user should take into account the possibility of manipulation with various accounting items when deciding on the basis of the previously mentioned models. In our opinion, it is necessary for any user of the accounts to take this risk into account when deciding. The group of users includes internal or external auditors, the owners, banks or other institutions, and the managers of Corporate Governance and everyone whose decisions regarding the outcome of accounting is dependent on the quality of the accounting data in the financial statements.

Based on their results, it is possible to identify risk points, reverse reaction in the financial statements or accounting (if you are a user who has access to the records) and to carry out detailed tests to obtain assurance that no manipulation occurred. The CFEBT model is considered to be a basic comprehensive view of the financial statements and the links between them. The model traces the development of the statements and links for more accounting periods (optimally in five years) and analyses the links between cash flow and profit. The paper also presents a modified version of this model, which is the result of identifying risk factors that emerged from the development of discrepancies in cash flow and profit. The modified version of the CFEBT model respects the individuality of the accounts of a sample entity and substantially eliminates the diversity of national accounting systems such as the Czech accounting standards, IFRS and US GAAP.

We believe that the suggested CFEBT model may be used by auditors to identify risks of accounting fraud in accordance with ISA 240 or by any user of accounts for testing financial statements. Its modified version may be used as a detailed test for auditors to identify risk; particularly in application of the audit judgement in assessing audit risk, in audit planning and in testing different items in the financial statements. It is appropriate to complement the CFEBT model with other models of M-score for testing the motivation of financial statements manipulation and the Jones' Non-discretionary Accruals models for testing the fluctuations in accruals.

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References

- Bell, A., C. (2009). *Data Analysis for Corporate Fraud Risk*. USA: Charlotte, North Carolina.
- Beneish, M. D. (2001). Earnings management: a perspective. *Managerial Finance*, 27 (12), 3– 17.
- Brennan, N., & McGrath, M. (2007). Financial Statement Fraud .Some Lessons From US and European Case Studies. *Australian Accounting Review*, 17(42), 49–61. "
- Cima (2009). *Fraud Risk Management: A Guide to Good Practice*, Chartered institute of Management Accountants. Retrived July, 2015 (Available from Cima Web site: http://www.cimaglobal.com/documents/importedddocuments/cid_techguide_fraud_risk_management_feb09.pdf)
- Drábková, Z. (2013). The potential to reduce the risk of manipulation of financial statements using the identification models of creative accounting. *Acta Universitatis Agriculturae et Silviculturae Mendelianae*, 226 (7), 2055-2063.
- Ernst&Young (2012). *Zpráva o boji s podvody*. Retrieved July , 2015 (Available from Ernst&Young Web site: <http://www.ey.com/CZ/cs/Newsroom/News-releases/Podvody--realisticka-reseni-realnych-rizik>)
- Jones, M., (2011). *Creative accounting, Fraud and International accounting scandals*. UK: John Wiley and Sons Ltd.
- Kubíčková, D. (2011). Financial Statements According to IFRS and the Bankruptcy Model Z-score, *Journal of Competitiveness*,1, 38-48.
- Mantone, S. P. (2013). *Using Analytics to Detect Possible Fraud: Tools and Techniques*. UK: John Wiley and Sons Ltd..
- Pricewaterhousecoopers (2014). *Global Economic Crime Survey 2014*. Retrieved July, 2015 (Available from <http://www.pwc.com/gx/en/economic-crime-survey/>)

CORPORATE SOCIAL RESPONSIBILITY AND FIRM'S TRANSPARENCY: EVIDENCE FROM THE CANADIAN MARKET

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Abstract: *In this article, we examine the association between Canadian firms' transparency and their corporate social responsibility (CSR) engagement. In particular, we empirically explore how CSR affects the amount of firm's future earnings information that is reflected in current stock prices. We consider that more transparent firms can "bring the future forward" so that their current stock prices track and reflect more information about future earnings. Most of our findings indicate that the relationship between CSR and firm's transparency is not statistically significant. One potential explanation of this neutral association is that Canadian firms already benefit from a richer information environment. Overall, our study suggests that many observers cynicism about CSR may be irrelevant. In fact, it appears that managers do not use CSR as a mechanism that advances their careers or other personal agenda.*

Keywords: *Corporate social responsibility, firm's transparency, stock price informativeness, stakeholders' theory, agency theory.*

Introduction

Two facts demonstrate the relevance of the concept of Corporate Social Responsibility (CSR) to both the academic and business world. First, firms increasingly undertake a range of CSR activities, and communicate these activities through their website as well as through annual reports or specific CSR reports. Second, the emergence of a market for CSR ratings where various independent agencies, such as Sustainalytics, MSCI ESG STATS (formerly KLD), Bloomberg, and Thomson Reuters ASSET4 evaluate firms based on their social performance (SP). The latter can be defined as "a business organization's configuration of principles of social responsibility, processes of social responsiveness, and policies, programs, and observable outcomes as they relate to the firm's societal relationships" (Wood, 1991, p.693).

In this paper, we investigate the relation between CSR and firm's transparency as measured by stock price informativeness. In particular, we try to answer the following question: does higher firm's social performance (SP) means more or less informed stock pricing? Following Jo & Kim (2007), we define socially responsible firms as firms that encourage extensive voluntary disclosure and value ethical financial reporting (e.g., more conservative earnings management instead of aggressive earnings management). While most of CSR studies focus on the relation between CSR engagement and firm's financial performance, the consequences of CSR on firm's

transparency-increasing disclosures have received less attention (Chui et al. 2012). We try to address this deficiency in the literature by providing a valuable setting that directly examines the association between CSR and firm's transparency. Our analysis is important because many theoretical and empirical papers show that inadequate disclosure together with asymmetric information can lead to market failures. Indeed, many financial scandals (e.g., Enron, WorldCom, Parmalat) and the recent financial crisis have raised serious concerns about unethical behaviors in financial reporting and asymmetric information problems. If CSR helps firms' implement ethical and extensive reporting practices, then we can say that CSR engagement plays an important role in financial markets. Otherwise, CSR activities do not necessarily result in more responsible behavior.

Our proxy of firm's transparency (stock price informativeness) is derived from the accounting literature (Collins et al., 1994; Gelb & Zarowin, 2002; Lundholm & Myers, 2002; Durnev et al., 2003). It is based on the intuition that firm's current stock return is determined by the unexpected current earnings and the change in expectations about future earnings. In our tests, we consider that more transparent firms can "bring the future forward" so that their current returns track and reflect more information about future earnings (Lundholm & Myers, 2002). Further, we argue that if CSR activities improve transparency, firm's social engagement should contribute to impound more future earnings information into current returns. Put differently, the extent to which firm's future earnings are reflected in current stock prices should differ based on firm's CSR engagement. Therefore, if CSR increases firm's transparency and reduces information asymmetry, high CSR firms should be priced more correctly relative to low CSR firms.

In the literature, two main opposing views regarding the benefits of CSR engagement and the relationship between CSR and stock price and/or firm performance have been proposed. The first view (e.g., Freeman, 1984; Jo & Harjoto, 2011, 2012) suggests a positive relationship between the two concepts based either on the stakeholder theory or the resources based theory (slack resources theory). The second view (e.g., Friedman 1970; Barnea & Rubin, 2010) suggests a negative relationship between the two concepts based on either the neoclassical economic theory or the agency theory. Some scholars also argue that it is possible that there is no association between the two concepts (Ullmann, 1985, McWilliams & Siegel, 2001). Unfortunately, the empirical evidence regarding the relation between CSR and firm performance or stock price is mixed as is the evidence regarding the relation between CSR and the profitability of socially responsible investment (SRI) funds (Deng et al., 2013).

Our study contributes to this literature in two different ways. First, to the best of our knowledge, our intuitive approach that was initially developed in the accounting literature is applied for the first time in the CSR literature. Our findings should then contribute to a better understanding of the link between CSR and stock price informativeness. As suggested earlier, we focus on firm's transparency because the recent 2008-2009 global financial crisis showed that the dissemination of transparent information is inadequate. In fact, we argue that high transparency is crucial if firms are to be held accountable for their actions.

Second, most papers in the literature involve indirect approaches focusing on indirect measures of firm's transparency (e.g., analyst coverage, recommendations, and forecasts accuracy). In our paper, we use a direct measure of firm's transparency that relies on fundamental data and test its relation with firm's CSR choice. We argue that if CSR activities increase transparency, firm's social engagement should contribute to keep stock prices in line with firm's fundamentals (firm's earnings). We consider that high transparency is associated with more

information about firm's future earnings being impounded in current stock prices, in accordance with a growing literature (Gelb & Zarowin, 2002; Lundholm & Myers, 2002; Durnev et al. 2003).

Some of our findings provide weak evidence suggesting that firm's CSR engagement that addresses social issues such as community, employees, customers, and contractors is positively linked to firm's transparency. Such findings support the stakeholder theory and/or the resources based theory (slack resources theory). However, most of the results indicate a neutral association between CSR and firm's transparency, which suggests that CSR activities have no impact on firm's transparency. As stressed by Cormier & Magnan (2013), firm's disclosure practices and total market information are complex phenomenon that cannot be explained by a single theory. In fact, the expected positive relation between CSR and stock price informativeness has to be nuanced. For instance, a firm's commitment to improve its disclosure policies can alter the incentives for other market participants (e.g., financial analysts) to collect and trade on private information. Therefore, we argue that any additional disclosure linked to CSR engagement could drive out private information acquisition, resulting in an ambiguous impact on total information in the market. Another potential explanation of the absence of any relationship between CSR and firm's transparency is that Canadian firms already benefit from a richer information environment and that CSR choice is more linked to other advantages (e.g., high exposure, stock liquidity, and prestige). Overall, it appears that Canadian firms' managers do not use CSR opportunistically to extract private benefits.

The remainder of the paper is organized as follows. Section 2 reviews prior literature and develops our main hypothesis. In sections 3, we explain the measurement of firm's transparency and our research design. Section 4 describes the data and sample selection. Section 5 presents our core evidence on the relation between CSR engagement and firm's transparency. Section 6 concludes.

Literature review and hypotheses development

The theory of information asymmetry reduction

Firm's transparency is aimed at reducing information asymmetry and providing a clear view to stakeholders about firm's long-term prospects. As Cui et al. (2012), we argue that the empirical relation between CSR and firm's transparency is pivotal because asymmetric information problems can adversely affect the market equilibrium (Akerlof, 1970; Jensen & Meckling, 1976). The latter is a driving factor for the well-being of communities and people. As suggested by many authors, where there is asymmetric information, there is an incentive for managers to engage in strategic behavior (e.g., entrenchment strategy) or unethical activities (e.g., aggressive earnings management). Such activities can generate important market failures (e.g., the recent financial crisis). Ultimately, firm's shareholders and other stakeholders can be affected negatively due to lack of private information.

To address this fundamental problem, ethical and transparent disclosures (mandatory and voluntary) can help bring managers' interests in line with investors' and other stakeholders' interests (Healy & Palepu, 2001; Verrecchia, 2001). In our study, we consider firm's disclosure practices as an important aspect of the overall discipline of CSR. We argue that socially responsible disclosures can be considered as a communication mechanism with stakeholders that goes above and beyond what is legally required of a firm (mandatory disclosure). Overall, as suggested by Harjoto & Jo (2011, p.351): "*CSR is an extension of firm's efforts to foster effective*

corporate governance, ensuring firm's sustainability via sound business practices that promote accountability and transparency”.

The theory of CSR engagement

To date, CSR remains a debatable concept both theoretically and empirically (Carroll, 1998; Van Marrewijk, 2003; Whitehouse, 2006; Freeman & Hasnaoui, 2011; Harjoto & Jo, 2011; Ioannou & Serafeim, 2012). In general, the foundation of CSR is the acknowledgement that firms have responsibilities that go above and beyond what is legally and financially required of a firm (Freeman & Hasnaoui, 2011; Jo & Harjoto, 2012). As noted by Whitehouse (2006), academics continue to debate the content and meaning of CSR, whereas companies, in particular larger ones, appear to have found common ground upon which they have constructed elaborate CSR policies and practices. Also investors appear to have found common ground upon which they have constructed elaborate CSR integration in investment decisions and ownership practices. The latter movement is better illustrated by the acronym ESG or environmental (E), social (S) and Governance (G) issues where investors integrate ESG information along with financial information (risk and return) into investment decisions and ownership policies.

Unfortunately, there is no such consensus among academics regarding CSR. For instance, CSR empirical studies do not agree on a common definition of CSR, e.g., should we include corporate governance within CSR or consider it as a separate element (Hess, 2008)? Several CSR studies treat corporate governance as a separate concept and include only social and environmental criteria in CSR (e.g., Harjoto & Jo, 2011; Jo & Harjoto, 2012; Ioannou & Serafeim, 2012). In this study, corporate governance is considered within CSR along with social and environmental criteria. In fact, major rating firms, such as Sustainalytics, MSCI ESG STATS, Bloomberg, and Thomson Reuters ASSET4 define CSR as E, S and G issues. This is also the definition adopted by socially responsible investors (e.g., major institutional investors who signed the PRI principles).

The theory of CSR engagement proposes two main opposing views regarding the benefits of CSR choice and the relationship between CSR and stock price and/or firm performance. The first view suggests many benefits linked to CSR activities (e.g., higher reputation, lower cost of capital, long-term economic success) and predicts a positive relationship between CSR and financial performance based either on the stakeholder theory or the resources based theory (slack resources theory). The second view considers CSR as a costly activity and predicts a negative relationship between the 2 concepts based on either the neoclassical economic theory or the agency theory. Some scholars also argue that it is possible that there is no association between the 2 concepts due to several reasons, e.g., CSR is not priced in financial markets, CSR measurement problems and/or omitted variables that affect both concepts (Ullmann, 1985, McWilliams & Siegel, 2001, Jo & Harjoto, 2012).

CSR as a transparency-increasing or decreasing mechanism

There is a growing empirical literature on the relation between CSR and firm's information environment. Jo & Kim (2007) show that high firm's transparency (e.g., frequent and persistent disclosures) reduces information asymmetry and discourages unethical earnings manipulation. Cui et al. (2012) document a negative association between CSR and information asymmetry. In the same line of reasoning, Gelb & Strawser (2001) argue that socially responsible firms provide more informative and/or extensive disclosures in comparison to firms that engage less in socially responsible activities. Other studies suggest that CSR may improve firm's information

environment through high analyst coverage (Hong & Kacperczyk, 2009) and low analyst forecasts errors and dispersion (Dhaliwal et al. 2011; Cormier et al. 2013; 2014).

On the other hand, some scholars (e.g., Hemingway & MacLagan, 2004) conjecture that companies engage in CSR to cover up corporate misbehaviour. For instance, some studies findings (e.g., Petrovits, 2006; Prior et al. 2008) indicate that CSR choice is positively correlated to earnings management.

Theoretically, there is no universally agreed-upon rationale behind the relation between firm's information environment and CSR engagement (Harjoto & Jo, 2012). The neoclassical economic theory (Jensen, 2002), also referred to the stakeholder expense view (Deng et al., 2013), considers CSR as an additional cost that could put the firm at a competitive disadvantage which reduces firm's profitability and share price. The neoclassical economic theory suggests that CSR investments result in a wealth transfer from shareholders to other stakeholders (Deng et al., 2013). For example, the firm could adopt a stringent monitoring system not required by the existing laws and not implemented by competitors. This costly monitoring system from shareholders' point of view could benefit other stakeholders, e.g., social interest groups. In short, the neoclassical economic theory suggests that CSR investments should be undertaken if and only if they benefit shareholders in the first place. It follows that any CSR activities that do not benefit shareholders is regarded as a waste of a firm's scarce resources. This argument implies that the financial market penalizes firms for overinvesting in CSR activities (Jo & Harjoto, 2012; Deng et al., 2013). In sum, based on this theory, firms' may undertake CSR activities not because they maximize shareholders' welfare (less asymmetric information), but because they are beneficial to other stakeholders. Hence, we should expect a negative association between CSR and firm's transparency.

Another theory (the agency theory) perceives CSR investments as a managerial rent-seeking behavior which takes place at the expense of both shareholders and other stakeholders. Here managers undertake CSR investments in order to advance their careers, develop entrenchment strategies, or promote their personal interests at the expense of all stakeholders, including shareholders (Deng et al., 2013). For example, some CSR activities may be driven primarily by managerial utility considerations, such as satisfaction of some personal imperative of the manager (Ioannou & Serafeim, 2012). Barnea & Rubin (2010) argue that firm's insiders tend to overinvest in CSR because doing so provides private benefits, e.g., it allows managers to build reputation as good social citizens (empire building approach). Cespa & Cestone (2007) argue that CEOs have an interest in engaging in CSR activities because such engagement may generate support from some shareholders and stakeholders activists, and ultimately reduce the probability of CEO turnover (entrenchment strategy). Hence, we expect CSR to be negatively associated with firm's transparency if CSR engagement is driven primarily by managerial utility considerations.

In the same line of reasoning, some firms may try to portray themselves as good citizens when in fact they may be poor social performers. The concern is that "greenwashing" and sometimes "disinformation" may become a management tool that promotes firm's image and maximize its value. Thus, if the greenwashing argument is correct, we should expect a gap between CSR claims and actual practices. In other words, CSR claims should be simply a firm's rhetoric and cannot be viewed as an extension of firm's efforts to promote transparency. Hence, we should not expect managers to go one step further to improve firm's transparency. In addition, greenwashing may push managers to disclose only some aspects of firm's information (positive aspects) without full disclosure of negative information. Therefore, the greenwashing argument implies that CSR should be negatively related to firm's transparency.

Both the neoclassical economic theory and the agency theory suggest a negative relation between CSR and firm's transparency. In fact, if non-performing CEOs are using CSR to avoid replacement, increase their job security, or to build their own reputation as good social citizens, then firm's transparency (stock price informativeness) will be negatively related to CSR because of the agency costs induced by CSR investments and mismanagement of firm's resources. Further, we argue that transparency is crucial if non-performing CEOs are to be held accountable for their actions. This reasoning leads to the following hypothesis:

Hypothesis 1: Based on the neoclassical economic theory and/or the agency theory, there is a negative relation between CSR and firm's transparency.

In contrast to the above arguments, the stakeholder theory, also referred to the stakeholder value maximization view (e.g., Deng et al., 2013) or the conflict-resolution hypothesis (Jo & Harjoto, 2012), suggests a positive relation between CSR and firm's transparency. The stakeholder theory conceptualizes the firm as a nexus of contracts between firm's owners (shareholders) and other stakeholders (Deng et al., 2013). There are 2 types of contracts: explicit (e.g., wage contracts for employees, debt contracts for banks and debtholders) and implicit (e.g., promises of job security for employees, environmental protection for interest groups, high product quality for customers). The explicit contracts are consistent with the well-established contract theory in finance. What is new with the stakeholder theory is the addition of the set of implicit contracts which are nebulous and not-legally binding because firms can default on their implicit commitment without being sued by the affected stakeholders (Deng et al., 2013). According to the stakeholder theory, high (low) CSR firms are less (more) likely to default on their commitments associated with the implicit contracts. Consequently, stakeholders of high (low) CSR firms are more (less) willing to contribute resources and efforts to the firm and accept less favorable explicit contracts, e.g., in difficult periods (Deng et al., 2013). Hence, the interests of shareholders are more aligned with those of other stakeholders for high CSR firms compared to low CSR firms because high CSR firms will enjoy higher reputation and support for their operations (Deng et al., 2013).

Based on the stakeholder theory, CSR can also be considered as a process that helps mitigate conflicts of interest between insiders, shareholders and non-investing stakeholders (Jensen 2002; Harjoto & Jo, 2011; Jo & Harjoto, 2012). This conflict-resolution hypothesis suggests that managers use CSR to resolve conflicts among stakeholders and act in the best interests of their shareholders. This is consistent with strategic CSR. Baron (2001) distinguishes three motivations that firms may have when undertaking CSR activities: strategic CSR, normative CSR (e.g., CSR motivated by normative principles such as altruism) or defensive CSR as a response to threats (pressures) from external groups such as social or environmental activists. "The term *"strategic CSR"* is used to refer to a profit-maximizing strategy that some may view as socially responsible" (Baron, 2001, p. 8). Jo & Harjoto (2012, p.56) summarize the strategic CSR as follows: "Stakeholder theory predicts that managers conduct CSR to fulfill their moral, ethical, and social duties for their stakeholders and strategically achieve corporate goals for their shareholders". For example, some companies, especially those that operate in highly competitive industries, can use CSR as an additional product attribute to attract more consumers and increase their profits (Servaes & Tamayo, 2013). Similarly, firms can use CSR as a signaling device, e.g., as a means of differentiation from competitors in a market where quality is difficult to observe. Fisman et al. (2006) suggest a signaling model where firms managed by socially concerned managers use philanthropy as a signal of the quality of their products and their concern for the consumer. The quality-signaling strategy should be more beneficial in high competitive industries (Servaes & Tamayo, 2013). It should also help firms, who also care about social welfare,

differentiate themselves from firms that are purely profit oriented. The basic rationale behind the signaling theory is that managers' of high-quality firms engage in CSR to signal their private information about firm's future prospects in a way that is too costly for low-quality firms to replicate (e.g., Bhattacharya, 1979; John & Williams 1985). In summary, the stakeholder theory predicts that firms with higher CSR will be perceived as being more transparent compared to firms with low CSR because CSR reduces agency costs and conflict of interest between managers, shareholders and non-investing stakeholders. Hence, we expect CSR to be positively related to firm's transparency.

In addition to the stakeholder theory, the resources based theory (slack resources theory) also predicts a positive relation between CSR and firm's transparency. Eccles et al. (2011) show that CSR is the result of the utilization of the firm's slack resources, and not an integral part of the firm's business model or its corporate culture. The resource based view of the firm suggests that firms can build a competitive advantage such as a good reputation as well as a unique relational capital with key stakeholders through CSR investments (Hart, 1995; Russo & Fouts, 1997; Qiu et al., 2014). Hart (1995) shows that an improved environmental performance confers a competitive advantage to the firm through securing and enhancing social legitimacy. Russo & Fouts (1997) argue that an improved environmental performance (e.g., a proactive environmental policy) allow the firm to develop a competitive advantage through the positive effects of a good reputation for leadership in environmental affairs. Qiu et al. (2014) examine the relation between a firm's environmental (E) and social (S) disclosure scores (from Bloomberg and Thomson Reuters Asset4 databases) and its profitability and stock price using a sample of listed UK firms. Their results suggest that more profitable firms, those with financial resource slack, have the ability and the willingness to invest in CSR, particularly S.

The prediction of the stakeholder theory and slack resources theory is consistent with the work of Fuller & Jensen (2002) who argue that managers must work to make their organizations more transparent to investors and to the markets. They prescribe some recommendations that managers should follow in order for the stock price to be close to the business intrinsic value (e.g., more informed pricing). Here we mention three recommendations that are closely related to our work. First, managers must confront capital markets with courage and conviction. Managers must not collude with analysts' expectations that don't fit with their own expectations. For example, they must decline to bow to analysts' desires for highly predictable earnings. Second, managers must be forthright and promise only those results they have a legitimate prospect of delivering, and be clear about the risk and uncertainties involved. Finally, managers should address the unexplained part of their firm's share price not directly related to observable cash flows, and have the willingness to tell the markets frankly when they see their stock price as overvalued. The above arguments lead to the following hypothesis:

Hypothesis 2: Based on the stakeholder theory and/or slack resources theory, there is a positive relation between CSR and firm's transparency.

Empirical Methodology

Our proxy of firm's transparency (stock price informativeness) is based on Collins et al. (1994), Gelb & Zarowin (2002), Lundholm & Myers (2002), and Durnev et al. (2003). These authors argue that firm annual return at time (t) is determined by the unexpected earnings at time (t) and the change in expectations about future earnings (t+i) between (t-1) and (t) (see equation 1 for more details). As suggested by Lundholm & Myers (2002), transparent firms can "bring the future forward" so that their current returns track and reflect more information about future earnings. In this paper, we investigate how CSR engagement affects the amount of future earnings information that is reflected in current stock return. If CSR activities improve transparency, we should expect a significant positive relation between firm's CSR scores and the amount of future earnings news reflected in current returns.

To better understand the intuition behind our methodology, we can consider a firm over four periods and a discount rate of zero. We denote period (t) earnings by e_t , dividends by d_t and book value by BV_t . Following Lundholm & Myers (2002), we can define prices at time 0 and time 1 as:

$$P_0 = BV_0 + E_0(e_1) + E_0(e_2) + E_0(e_3) + E_0(e_4)$$

$$P_1 = BV_1 + E_1(e_2) + E_1(e_3) + E_1(e_4)$$

In addition, if we assume a clean surplus accounting system, we can substitute BV_1 by $BV_0 + e_1 - d_1$ and get the following formula for prices at time 1:

$$P_1 = BV_0 + e_1 - d_1 + E_1(e_2) + E_1(e_3) + E_1(e_4)$$

$$P_1 = P_0 - E_0(e_1) - E_0(e_2) - E_0(e_3) - E_0(e_4) + e_1 - d_1 + E_1(e_2) + E_1(e_3) + E_1(e_4)$$

$$P_1 - P_0 + d_1 = e_1 - E_0(e_1) + E_1(e_2) - E_0(e_2) + E_1(e_3) - E_0(e_3) + E_1(e_4) - E_0(e_4)$$

$$P_1 - P_0 + d_1 = Ue_1 + \Delta E_1(e_2) + \Delta E_1(e_3) + \Delta E_1(e_4) \quad (1)$$

Scaling equation (1) by P_0 , the left-hand side equates with the annual return for year 1. The right-hand side becomes the scaled unexpected earnings for year 1 (Ue_1) and the change in expectations during year 1 about future earnings in year 2, 3 and 4.

The unexpected current earnings and change in expectations about future earnings being unobservable, we follow the standard practice in the literature and use the level of earnings at periods (t) and (t-1) as a proxy for Ue_t . As stressed by Lundholm & Myers (2002, p. 813): "*by including the past year's earnings, we allow the regression to find the best representation of the prior expectation of current earnings: if the coefficient on e_{t-1} is of similar magnitude but opposite sign as the coefficient on e_t then earnings is being treated by the market as if it follows a random walk; if the coefficients on e_{t-1} is approximately zero then earnings is being treated as a white noise process*".

To proxy for changes in expectations about future earnings, we use realized future earnings and future returns. Some papers (Beaver et al. 1980; Warfield & Wild, 1992) only use realized future earnings as a proxy for expected future earnings. However, using only realized future earnings introduces an error in variables because future earnings have expected and unexpected

components. To correct for the error and control for the unexpected component, we need an instrument that is correlated with the measurement error but uncorrelated with the dependent variable (current return). Following Collins et al. (1994), we use future returns since an unexpected shock to future earnings should have an impact on future returns.

We then characterize firm i current annual stock return ($R_{i,t}$) as the sum of the following components:

$$R_{i,t} = \beta_0 + \beta_1 e_{i,t-1} + \beta_2 e_{i,t} + \beta_3 e_{i,3t} + \beta_4 R_{i,3t} + \varepsilon_{i,t} \quad (2)$$

Where e_{t-1} and e_t represent earnings at periods $(t-1)$ and (t) ; e_{3t} denotes firm's future earnings for three years following the current year; and R_{3t} is the buy-and-hold return for the three year period following the current year. We use only three years of future earnings and returns because prior research has shown that amounts further out in time add little explanatory power (e.g., Collins et al. 1994, and Lundholm & Myers, 2002). In addition, as stressed by Lundholm & Myers (2002, p. 813): *"the regressions coefficients in the more general model in (2) allow for many complications not present in the simple example shown in (1), such as time value, risk, and the precision of the proxies used to measure unexpected current earnings and changes in expected future earnings"*. The coefficient β_3 in model (2) represents the relation between firm's current return ($R_{i,t}$) and firm's realized future earnings ($e_{i,3t}$). We argue that the more $R_{i,t}$ contains information about firm's real future earnings, the higher the coefficient β_3 . In other words, future earnings coefficient (β_3) is our proxy for stock price informativeness (firm's transparency). If managers are transparent to shareholders and non-investing stakeholders, then their disclosure policies should leave less information about future earnings that can be privately discovered. Consequently, stocks should exhibit price convergence to firm's fundamentals (high β_3). It is worth mentioning that our proxy of firm's transparency does not require that capital markets are efficient (semi-strong form) because we test relative informativeness (information about future earnings and not necessarily all public information). This is desirable because we could find weak associations between CSR and firm's transparency that can be explained by less efficient price discovery processes.

To test whether CSR engagement affects the association between current stock returns and future earnings (our proxy for firm's transparency), we propose the following model:

$$R_{i,t} = \beta_0 + \beta_1 e_{i,t-1} + \beta_2 e_{i,t} + \beta_3 e_{i,3t} + \beta_4 R_{i,3t} + \theta_1 CSR_{i,t} + \theta_2 CSR_{i,t} * e_{i,3t} + \theta_3 CSR_{i,t} * R_{i,3t} + \theta_4 \text{controls} + \varepsilon_{i,t} \quad (3)$$

Where CSR is firm's CSR scores which represent our proxy for CSR engagement. Our main interest in equation (3) centers on θ_2 , the coefficient of the interaction term ($CSR_{i,t} * e_{i,3t}$) that proxies for the impact of firm's CSR scores on the amount of realized future earnings news that are reflected in current return. A positive θ_2 means that high CSR scores increase at time (t) the amount of information about real future earnings $(t+3)$ that is reflected in current prices. In other words, firm's CSR engagement increases the precision of information conveyed by stock prices and therefore improves firm's transparency. Hypothesis 2 predicts that θ_2 will be positive. On the other hand, hypothesis 1 suggests that θ_2 will be negative. The null hypothesis predicts that θ_2 will be approximately equal to zero.

Because CSR engagement can be endogenously determined, we also conduct an endogeneity correction procedure. As suggested by Harjoto & Jo (2011), without considering endogenous treatment effects in which better quality firms (e.g. firms with high disclosure standards) tend to have high CSR scores, the association between CSR and firm's transparency will be overstated or falsely attributed. Furthermore, it may also be possible that firms, engaging in CSR activities, deliver higher returns to investors. In this case, an OLS estimation of equation (3) will produce biased parameters because CSR is correlated with the error term. We address the endogeneity concern by using two econometric approaches. The first approach relies on the Heckman (1976) two-stage procedure. In the first stage, we rely on a probit analysis of the firm's probability to engage in CSR activities. In fact, we follow prior studies and consider that firm's governance structure and characteristics may lead to CSR engagement. For instance, Harjoto & Jo (2011) find that independent boards and analyst coverage are positively related to the choice of CSR. As suggested by many studies (e.g. Knyazeva 2007; Yu 2008), financial analysts can monitor managers by scrutinizing financial statements and rising questions when they interact with them. This monitoring role may increase the likelihood of managers opting for CSR engagement. In the same line of reasoning, board independence can also be considered as an important monitoring mechanism that influences the behavior of firm's managers. Independent boards may help align managers with stakeholders and ultimately increase CSR involvement. Furthermore, according to Harjoto & Jo (2011, p.51): "*CSR involvement is, on average, more common among larger firms, more leveraged firms, and more profitable firms*". Hence, we model the CSR choice as follow (first-stage):

$$U_i = W_i \gamma + v_i \quad (\text{CSR engagement equation}) \quad (4)$$

$$\text{Engagement}_i = 1 \text{ if } U_i > 0 ; 0 \text{ otherwise}$$

Where U_i is an unobserved latent variable (utility of firm i to engage in CSR activities) and W_i is a set of variables that affect the CSR choice (firm's governance structure and characteristics). We don't observe U_i . All we observe is a dichotomous variable Engagement_i with the value of one if the firm has high CSR scores (scores above the sample median CSR score) and 0 otherwise. The estimated parameters of equation 4 are used to calculate the inverse Mills' ratio, which is then included as an additional explanatory variable in the OLS estimation of equation 3 (second-stage estimation).

The second approach is the instrumental variables (IV) methodology. Following prior studies (e.g., Harjoto & Jo, 2001, 2012), we use firm age (FIRMAGE) as an instrumental variable. We also use geographic location, which is measured as the average CSR score of the surrounding firms in the same province (e.g., Ontario), as an additional instrument in the first-stage regression. In our case, FIRMAGE and the average CSR score are highly correlated with CSR, but uncorrelated with $R_{i,t}$. The more highly correlated the instruments with CSR, the more precise our estimates will be. The instrumental variables (IV) regression is estimated using the two-step efficient generalized method of moments (GMM) which generates efficient estimates of the coefficients and consistent estimates of the standard errors that are robust to the presence of arbitrary heteroskedasticity and clustering by firm.

Data and sample selection

Our initial sample consists of the 125 Canadian firms covered by Sustainalytics database during the years 2004-2009. After merging Sustainalytics database with Datastream, our final sample includes 111 firms. All financial variables (e.g. stock return, earnings, size, and leverage) are obtained from Datastream.

Sustainalytics ratings of Canadian firms are based on data gathered from a range of sources, both internal and external to the firm. Ratings are determined through extensive detailed research, including review of internal documents (company reporting), external documents (e.g., media reports, NGO reports, industry publications), interviews (e.g., solicitation of company feedback), analysis by experienced analysts, and peer review by sector specialists. Sustainalytics approach assesses sustainability policies, management systems and performance outcomes related to environment (E), social (S), and governance (G) issues using industry-specific indicators.

For each E, S, and G dimension, several indicators are used to assess each company. Examples of indicators within the E dimension include environmental policy, percentage of ISO 14001 certified sites and suppliers, targets and programs to reduce air emissions, and environmental fines and penalties. Examples of indicators within the S dimension include the percentage of ISO 9000 certified sites, product recalls, philanthropic activities, diversity in the workforce, lay-offs and job cuts, monitoring systems to ensure compliance, and controversies over freedom of association and child/forced labour. Examples of indicators within the G dimension include a separate position for chairman of board and CEO, number (%) of independent directors in the Board, directors' and/or CEO's remuneration/compensation, variable remuneration linked to sustainability performance, and formal policy on corruption and money laundering.

Sustainalytics database provides company performance scores on E, S, and G dimensions (three sub-scores: E, S, and G score) as well as CSR total score (ESG overall score). The CSR total score is created for each company by multiplying the weights of each sub-score with the sub-scores and adding them up. All CSR ratings range from 0 to 100. A higher score indicates a strong and detailed CSR engagement. In our empirical analysis, we use these four CSR scores.

The CSR rating frequency is not uniform through years or firms. For example, only 5 firms are rated in 2004, whereas 110 firms are rated in 2009. Also, the rating is done twice in 2005 (March and November), in seven months in 2006 (Jan, Feb, April, August, Sep, Nov and Dec), almost every month in 2007 and 2008, and only once in 2009 (January). Since the financial variables are available yearly, we need to construct annual CSR scores. For each year and firm, we compute the average CSR score as the average value of all available monthly ratings.

To control for industry, we include industry dummies in our regressions. We classify industries based on the 10 industry groups of the FTSE Industry Classification Benchmark (ICB): Oil & Gas (20.91% of the sample), Basic Materials (23.64%), Industrials (8.18%), Telecommunications (3.64%), Health Care (1.82%), Consumer Services (12.73%), Consumer Goods (3.64%), Utilities (2.73%), Financials (17.27%), and Technology (5.45%). We also include year dummy variables in our regressions in order to control for general market conditions.

Empirical results

Table 1: Descriptive Statistics

This table presents descriptive statistics for the sample between years 2004 and 2009. **Current return** for year (t) (R_t) is the fiscal-year-end adjusted share price, plus the adjusted dividends, all divided by the adjusted price at the end of the previous fiscal year (t-1). **Future return** (R_{3t}) is the buy-and-hold return for the three-year period following the current year (for years t+1, t+2 and t+3). **Lagged earnings** (e_{t-1}) is net income before extraordinary items for year (t-1) divided by the market value of equity at the beginning of the firm's fiscal year. **Current earnings** (e_t) is net income before extraordinary items for year (t) divided by the market value of equity at the beginning of the firm's fiscal year. **Future earnings** (e_{3t}) is the sum of earnings for the three years following the current year (for years t+1, t+2 and t+3). Market value of equity is the share price times the previous year number of shares outstanding. **Total Score** represents CSR ratings (CSR performance). Such score is based on assessments of corporate activities in three different areas: social, governance, and environmental practices. For robustness, we also use separately CSR scores for each area. **Size** is the logarithm of the market capitalization. **Leverage** is long term debt plus short term debt, all divided by total assets. **Market-to-Book (M/B)** is the market to book ratio. **Asset growth** is total assets at the end of year (t+2) minus total assets at the end of year (t), all divided by total assets at the end of year (t). **Liquidity** is defined as trading volume divided by the number of shares outstanding.

All financial variables are winsorized at the 1% and 99% levels.

Variables	Mean	median	Min	Max	Std dev	N
Current return (R_t)	1.2322	1.1806	0.2139	3.8550	0.5206	1061
Future return (R_{3t})	1.8135	1.5198	0.1650	8.3243	1.3441	876
Lagged Earnings (e_{t-1})	0.0639	0.0672	-0.4346	0.5258	0.1175	978
Current earnings (e_t)	0.0625	0.0672	-0.4117	0.4957	0.1144	1065
Future earnings (e_{3t})	0.3034	0.2497	-1.7037	2.9682	0.5175	737
Total Score (TS)	54.492	53.5	34.8	77.10	7.4325	365
Environmental Score (ES)	39.487	38.3	13.63	84.1	11.456	365
Social Score (SS)	48.240	47.54	30.62	70.7166	8.4699	365
Governance Score (GS)	82.109	83.72	32.165	98.47	9.4472	365
Size	15.446	15.504	11.410	17.963	1.3251	1176
Leverage	0.2161	0.2051	0	0.6278	0.1541	1194
Market-to-Book (M/B) ratio	2.6046	2.2163	0.2483	10.843	1.7089	1174
Asset Growth	0.6028	0.2823	-0.6059	11.996	1.4974	974
Liquidity	18.946	13.343	0.5315	112.86	19.342	1173

Table 1 reports summary statistics for our sample. We present the mean, median, minimum value, maximum value, standard deviation, and the number of observations. Returns for firm i at time t (R_t) are the buy-and-hold returns for the 12 months period starting at the beginning of the fiscal year. Future returns (R_{3t}) are the buy-and-hold returns for the three years period following year (t). We define firm's earnings as net income before extraordinary items divided by the market value of equity. Future earnings (e_{3t}) are the sum of earnings for the three years following year (t). Since Sustainability definition and measurement of CSR includes three dimensions (E, S, and G), we use in our analysis CSR total scores (overall scores or TS) and individual scores (sub-scores: ES, SS and GS, respectively) of each dimension. The average (median) CSR total score is 54.492 (53.5). The S and E sub-scores are much lower suggesting that firm's total scores are pulled downward by these two subcategories. Finally, the mean (median) G score is 82.109 (83.72).

Table 2: Pearson Correlations

This table presents the correlations between variables. The sample period is from 2004 to 2009.

	R_t	R_{3t}	e_{t-1}	e_t	e_{3t}	TS	ES	SS	GS
R_t	1.0000	-0.0213	0.1925*	0.2946*	0.2135*	0.0618	0.0415	0.0826	-0.0099
R_{3t}	-0.0213	1.0000	-0.0043	0.1482*	0.5311*	-0.0055	0.0577	-0.0147	-0.0404
e_{t-1}	0.1925*	-0.0043	1.0000	0.3400*	0.1311	0.0632	-0.0214	0.0809	0.0641
e_t	0.2946*	0.1482*	0.3400*	1.0000	0.3995*	0.0737	-0.0456	0.1128	0.0748
e_{3t}	0.2135*	0.5311*	0.1311	0.3995*	1.0000	0.0934	0.0842	0.0728	0.0013
TS	0.0618	-0.0055	0.0632	0.0737	0.0934	1.0000	0.7731*	0.8567*	0.5794*
ES	0.0415	0.0577	-0.0214	-0.0456	0.0842	0.7731*	1.0000	0.5097*	0.1543
SS	0.0826	-0.0147	0.0809	0.1128	0.0728	0.8567*	0.5097*	1.0000	0.4332*
GS	-0.0099	-0.0404	0.0641	0.0748	0.0013	0.5794*	0.1543	0.4332*	1.0000

* Significant at 1 % level

Table 2 shows the correlations between our main variables. As expected, the CSR total score is highly and significantly correlated with all three sub-scores (e.g. Pearson coefficient is 0.8567 between TS and SS). On the other hand, correlations between S, E, and G sub-scores are much lower (e.g., Pearson coefficient is 0.1543 between ES and GS). As suggested earlier, our empirical goal is to investigate whether CSR engagement (high CSR scores) allows stock prices to reflect more information about future earnings. If this hypothesis is correct, CSR scores should correlate positively with firm's future earnings. The positive and non-significant correlations between our CSR scores and (e_{3t}) do not confirm this hypothesis. However, we argue that our tests are best performed using a multivariate regression analysis because the univariate findings do not account for a variety of factors known to affect the return-future earnings relation. Our correlation analysis also indicates that future returns (R_{3t}) are not significantly correlated with current returns (R_t) but are significantly correlated with (e_{3t}), consistent with Collins et al. (1994)

and Lundholm & Myers (2002). As suggested by Lundholm & Myers (2002, p. 822): “*future returns should not influence the regression results except through their role as a proxy for the measurement error in future earnings*”. Finally, the correlations between R_{3t} , e_t , e_{t-1} and e_{3t} are not excessive, suggesting that multicollinearity should not be an issue in our multivariate analysis.

Table 3 reports the primary empirical tests of equation (3). We present our findings without control variables (model 1-4) and with a variety of controls variables (model 5-8). In the literature, earnings timeliness (the speed with which earnings information is reflected in stock prices) and firm size have been shown to be significantly related to current and future earnings response coefficients. Hence, we suggest using the percentage growth in firm's assets and firm size as control variables in equation (3). The purpose is to control for observed variations in future earnings–current return relation that are likely due to causes other than CSR engagement. After controlling for these factors, our empirical measure should reflect firm's transparency (stock price informativeness). In fact, we argue that firms with high expected growth should exhibit a strong relation between current returns and future earnings in comparison to mature firms, all else equal. The intuition behind this idea is that future earnings will be considered as a better measure of value creation for firms' with high growth opportunities, but a less relevant measure for mature firms. We define growth as the percentage growth in firm's assets from year $t-2$ to year t . Size might also be an important omitted variable because Freeman (1987) and Collins & Kothari (1989) find that returns of larger firms impound earnings on a more timely basis than returns of smaller firms. To measure firm's size, we use the natural logarithm of market capitalization. We also include market-to-book (M/B) ratio, leverage and stock liquidity into equation (3) to control for differences in returns arising from these factors. Note that the results of estimations with control variables are similar to those without control variables, suggesting that the inclusion of such variables does not alter our main conclusions.

Table 3

Corporate Social Responsibility and Firm's Transparency: primary results

This table presents coefficients and test statistics from estimations of the following regression:

$$R_{i,t} = \beta_0 + \beta_1 e_{i,t-1} + \beta_2 e_{i,t} + \beta_3 e_{i,3t} + \beta_4 R_{i,3t} + \theta_1 CSR_{i,t} + \theta_2 CSR_{i,t} * e_{i,3t} \\ + \theta_3 CSR_{i,t} * R_{i,3t} + \theta_4 \text{ controls} + \varepsilon_{i,t}$$

We estimate all models using Ordinary Least Square (OLS) regressions with year and industry fixed effects. Year and industry dummies coefficients are not reported for parsimony. We test the association between CSR and firm's transparency using CSR total score (TS) and scores for each of

the three areas covered by Sustainalytics (social (SS), environmental (ES), and governance (GS) area). Model 1,2,3 and 4 present coefficients from regressions without control variables. Model 5,6, 7 and 8 include additional control variables (firm's size, leverage, market-to-book ratio, asset growth and stock liquidity). Standard errors are adjusted for both heteroskedasticity and clustering at the firm level. One, two or three asterisks denote significance at the 10%, 5% and 1% levels, respectively.

Independent Variables	OLS without control variables				OLS with control variables			
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
	(TS)	(ES)	(GS)	(SS)	(TS)	(ES)	(GS)	(SS)
Intercept	1.5036***	1.5388***	1.3575***	1.5614***	0.6364*	0.7511***	0.5995	0.7742**
Lagged earnings	0.3128*	0.2929	0.3239*	0.2916	0.1390	0.1408	0.1662	0.1506
Current earnings	0.8345***	0.7822***	0.8737***	0.9165***	0.5289***	0.5316**	0.6119**	0.6052***
Future earnings	-0.0348	0.5882*	-0.4684	-0.6813	0.7698	0.6843**	0.2803	-0.2076
Future return	0.0470	-0.0927	-0.0072	0.0257	-0.0116	-0.1084**	-0.0356	-0.0101
CSR	-0.0024	-0.0024	-0.0004	-0.0046	0.0008	-0.0009	0.0022	-0.0030
CSR *Future earnings	0.0089	-0.0034	0.0111	0.0244**	-0.0077	-0.0076	0.0009	0.0124
CSR*Future return	-0.0032	-0.0006	-0.0013	-0.0034	-0.0019	0.0000	-0.0010	-0.0024
Size					0.0407	0.0400	0.0301	0.0417

CORPORATE SOCIAL RESPONSIBILITY AND FIRM'S TRANSPARENCY: EVIDENCE FROM THE CANADIAN MARKET

Independent	OLS without control variables				OLS with control variables			
Variables	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
	(TS)	(ES)	(GS)	(SS)	(TS)	(ES)	(GS)	(SS)
Leverage					-0.2898*	-0.2827	-0.2991*	-0.2889*
Market-to-Book					0.0509**	0.0514**	0.0566***	0.0470**
Asset Growth					0.0268*	0.0276*	0.0269*	0.0192
Liquidity					0.0028***	0.0028***	0.0028***	0.0029***
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.683	0.682	0.677	0.688	0.738	0.739	0.735	0.740
N	306	306	306	306	306	306	306	306

For all models, we run OLS estimations with year and industry fixed effects. Standard errors are adjusted for both heteroskedasticity and clustering at the firm level. We focus on the coefficients of the interaction variable ($CSR_{i,t} * \text{future earnings}$) because we intend to examine whether high CSR scores impact the return-future earnings association. If CSR engagement is associated with stock returns reflecting more information about future earnings, we should have a positive and significant θ_2 . Model 1 and 5 of Table 3 present coefficients and test statistics from estimations using CSR total scores. The remaining models examine the association between CSR and firm's transparency using scores of each of the three dimensions covered by Sustainalytics (SS, ES, and GS). Our estimations reveal two important findings. First, strong CSR engagement exerts an insignificant effect on current return-future earnings association (firm's transparency). In fact, θ_2 is not significant in seven of the eight estimations presented in Table 3. Second, only model 4 findings indicate a positive association between firm's social scores and firm's transparency (our coefficient of interest is positive (0.0244) and significant at 5% level). Model 4 social scores are based on indicators linked to firm's employees (e.g., formal policies on elimination of discrimination, freedom of association, health and safety, and diversity in the workplace), contractors & supply chain, customers (e.g., product safety), society & community (e.g., controversies over local communities and activities in sensitive countries), and philanthropy. It appears that an increase of involvement in the social category (higher SS) is followed by an increase in firm's transparency. On the other hand, an improvement in other categories (E and G) has no impact on firm's transparency.

We also check the robustness of our primary results in several ways. First, we re-estimate equation (3) using firm-fixed effects instead of OLS estimation (see Table 4 for more details). The purpose is to control for unobserved time-invariant firm characteristics. When we capture time-invariant heterogeneity (firm-fixed effects), our coefficient of interest (θ_2) becomes insignificant in the case of social scores. The remaining results are similar to those reported in Table 3. Again, an increase in CSR involvement does not make firm's information environment more transparent.

Second, we use the two-stage Heckman procedure to mitigate self-selection concerns. The findings (see Table 5 for more details) suggest that firms with high CSR total scores are more transparent in comparison to firms with low scores. In addition, high scores in the S dimension improve firm's transparency while an increase of involvement in G and E dimensions has no effect on firm's transparency. So far, there is weak evidence indicating that one CSR dimension (S dimension) plays an important role in improving firm's transparency. This implies that CSR engagement linked to firm's employees, customers, communities, contractors and philanthropy can be considered as an extension of firm's efforts that promote high transparency. On the other hand, CSR engagement in E and G dimensions does not necessarily result in high transparency or more informed stock pricing.

CORPORATE SOCIAL RESPONSIBILITY AND FIRM'S TRANSPARENCY: EVIDENCE FROM THE CANADIAN MARKET

Table 4

Corporate Social Responsibility and Firm's Transparency: robustness results

This table presents coefficients and test statistics from estimations of the following regression:

$$R_{i,t} = \beta_0 + \beta_1 e_{i,t-1} + \beta_2 e_{i,t} + \beta_3 e_{i,3t} + \beta_4 R_{i,3t} + \theta_1 CSR_{i,t} + \theta_2 CSR_{i,t} * e_{i,3t} + \theta_3 CSR_{i,t} * R_{i,3t} + \theta_4 \text{ controls} + \varepsilon_{i,t}$$

We estimate all models using firm fixed and year fixed effects analysis. Year dummies coefficients are not reported for parsimony. We test the association between CSR and firm's transparency using CSR total score (TS) and scores for each of the three areas covered by Sustainalytics (Social (SS), environmental (ES), and governance (GS) area). Model 1,2,3 and 4 present coefficients from regressions without control variables. Model 5,6, 7 and 8 include additional control variables (firm's size, leverage, market-to-book ratio, asset growth and stock liquidity) . Standard errors are adjusted for both heteroskedasticity and clustering at the firm level. One, two or three asterisks denote significance at the 10%, 5% and 1% levels, respectively.

Independent Variables	Fixed effects analysis without control variables				Fixed effects analysis with control variables			
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
	(TS)	(ES)	(GS)	(SS)	(TS)	(ES)	(GS)	(SS)
Intercept	1.7826***	1.8407***	1.4104***	1.8197***	0.6998	0.7580	0.2516	0.5344
Lagged earnings	0.5307*	0.5936**	0.5711**	0.5121*	0.2379	0.3246	0.2548	0.2222
Current earnings	1.2736***	1.3323***	1.3544***	1.2985***	0.9458***	1.0024***	0.9497***	0.9377***
Future earnings	1.7303	1.5041**	-0.0591	0.2221	1.9805	1.5474**	-0.4894	0.3379
Future return	-0.1056	-0.2007**	-0.1198	-0.0898	-0.2548**	-0.2271***	-0.2927***	-0.1934*
CSR	-0.0003	-0.0024	0.0028	-0.0033	-0.0034	-0.0035	-0.0019	-0.0058
CSR *Future earnings	-0.0181	-0.0163	0.0108	0.0116	-0.0246	-0.0193**	0.0154	0.0075
CSR*Future return	-0.0010	0.0012	-0.0005	-0.0017	0.0022	0.0023*	0.0019	0.0009
Size					0.0627	0.0562	0.0847	0.0746
Leverage					0.2144	0.1738	0.2060	0.1293

Independent	Fixed effects analysis without control variables				Fixed effects analysis with control variables			
Variables	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
	(TS)	(ES)	(GS)	(SS)	(TS)	(ES)	(GS)	(SS)
Market-to-Book					0.0461	0.0472	0.0322	0.0370
Asset Growth					0.0171	0.0198	0.0080	0.0124
Liquidity					0.0106***	0.0107***	0.0112***	0.0106***
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.707	0.714	0.706	0.705	0.766	0.775	0.767	0.762
N	306	306	306	306	306	306	306	306

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Table 5

Corporate Social Responsibility and Firm's Transparency: self-selection bias estimation

This table reports the results of the Heckman (1979) two-stage procedure. In the first stage, we present the coefficient estimates from a probit model explaining the determinants of CSR engagement. We consider that firm's governance structure (e.g. Independent boards (INBOARDS) and analyst coverage) may lead to CSR engagement. NA, in the first stage equation, is the number of analysts following the firm. We also consider firm's characteristics (size, leverage, market-to-book, and ROA). The dependent variable is a dichotomous variable that takes the value of 1 if firm's social ratings are above the sample median and 0 otherwise. Model 1 reports results from regressions using CSR total score (TS). Model 2, 3 and 4 present results from estimations using social scores (SS), environmental scores (ES) and governance scores (GS), respectively. In the second stage, we estimate our main equation with control variables (firm's size, leverage, market-to-book ratio, asset growth and stock liquidity). Standard errors are adjusted for both heteroskedasticity and clustering at the firm level. One, two or three asterisks denote significance at the 10%, 5% and 1% levels, respectively.

First stage	Model 1	Model 2	Model 3	Model 4	Second Stage	Model 1	Model 2	Model 3	Model 4
Dependent variable	Probit	Probit	Probit	Probit	Dependent variable	(TS)	(SS)	(ES)	(GS)
(CSR dummy)	(TS)	(SS)	(ES)	(GS)	(Return)				
Intercept	0.2625	-12.79***	1.2777	-4.175*	Intercept	0.8872	1.0579	-0.1068	-2.7026
Log(1+NA)	0.0388	-0.7020	0.9625*	0.5961	Lagged earnings	0.1653	0.2659	0.0865	0.0040
INBOARDS	1.9125*	3.2670**	0.3186	0.7404	Current earnings	1.3236***	1.6669***	1.4026***	1.5715***
Size	0.3353**	0.8075**	0.1915	0.1822	Future earnings	-7.4218***	-3.6505**	0.2200	4.1248
Leverage	1.1931	0.7811	3.1500*	0.5018	Future return	0.1588	0.3426	-0.0169	0.7980
Market-to-Book	-0.248***	-	-0.429***	-0.2703*	CSR	-0.0233**	-0.0044	0.0022	0.0158
ROA	0.7851	0.1396*	2.0304	2.1222	CSR*future earnings	0.1330***	0.0737***	0.0026	-0.0405
		-1.5619			CSR*Future return	-0.0051	-0.0086	-0.0032	-0.0103
					Size	0.0801**	-0.0008	0.0556	0.1126*
					Leverage	0.0133	-0.3189	-0.6553*	-0.0086

First stage	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	Second Stage	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>
Dependent variable	Probit	Probit	Probit	Probit	Dependent variable	(TS)	(SS)	(ES)	(GS)
(CSR dummy)	(TS)	(SS)	(ES)	(GS)	(Return)				
					Market-to-Book		0.0799***	0.0595*	0.0289
						0.0216			
					Asset Growth		0.0261	0.0240	0.0139
						0.0147			
					Liquidity		0.0025**	0.00035** *	0.0026
						0.0028***			
					Mills		-0.1277		0.3919
						-0.0126		-0.0818	
					Industry dummies		Yes		Yes
								Yes	
					Year dummies	Yes	Yes		Yes
						Yes		Yes	
					Wald chi2		556.8		178.6
					p-value Wald chi2	489.6	0	489.6	0
					N	0	246	0	247
						247		247	

Third, we use the IV method to address other sources of endogeneity. We report the findings of such analysis in Table 6. Again, the impact of CSR activities on the return-future earnings association remains insignificant, suggesting a neutral relation between CSR and firm's transparency.

CORPORATE SOCIAL RESPONSIBILITY AND FIRM'S TRANSPARENCY: EVIDENCE FROM THE CANADIAN MARKET

Table 6

Corporate Social Responsibility and Firm's Transparency: Instrumental Variable approach

This Table presents the results of the Instrumental variable methodology that addresses endogeneity concerns on the impact of CSR engagement on firm's transparency. One, two or three asterisks denote significance at the 10%, 5% and 1% levels, respectively.

Independent Variables	Instrumental variable approach estimation			
	Model1	Model2	Model3	Model4
	(TS)	(ES)	(GS)	(SS)
Intercept	-2.226	0.4607	-2.263	21.78
Lagged earnings	0.347	0.2061	0.246	-2.722
Current earnings	0.495	0.640**	0.640**	2.752
Future earnings	3.146	0.540	2.890	-19.87
Future return	0.982	-0.267	0.631	-9.366
CSR	0.055	-0.011	0.031	-0.542
CSR*Future earnings	-0.047	-0.003	-0.030	0.409
CSR*Future return	-0.021	0.004	-0.009	0.195
Size	-0.015	0.027	0.006	0.322
Leverage	-0.128	0.004	-0.065	-0.435
Market-to-Book	0.070**	0.052***	0.074*	0.078
Asset Growth	0.041	0.027*	0.038	-0.220
Liquidity	0.000	0.001	0.000	0.016

Independent	Instrumental variable approach estimation			
Variables	Model1	Model2	Model3	Model4
	(TS)	(ES)	(GS)	(SS)
Year dummies	Yes	Yes	Yes	Yes
N	296	296	296	296
P value of Hansen statistic	0.544	0.458	0.347	0.993

Conclusion

In this paper, we propose to apply a new empirical methodology for the first time in the CSR literature, which we hope will contribute to a better understanding of the association between CSR engagement and firm's transparency. We analyse a sample of Canadian firms covered by Sustainalytics database during the 2004-2009 period along the three CSR issues: environment (E), social (S), and governance (G).

We show that CSR involvement can improve firm's transparency in certain circumstances, while it has no impact on firm's information environment in most cases. In fact, there is some weak evidence suggesting that the social (S) dimension (e.g., community, employees, customers, and contractors) plays a significant positive role in improving firm's transparency. Overall, our results suggest that firm's CSR engagement, in particular for E and G issues, has no impact on firm's transparency. The neutral association between CSR and firm's transparency is not an indicator that Canadian firms' disclosure policies are inadequate or unethical. For instance, a firm's commitment to increase disclosure can alter the incentives for other market participants (e.g., financial analysts) to collect and trade on private information. Therefore, we argue that any additional disclosure linked to CSR engagement could drive out private information acquisition, resulting in an ambiguous impact on total information in the market. It is also plausible that Canadian firms already benefit from a richer information environment and that CSR engagement is more oriented to benefit from advantages linked to higher exposure, stock liquidity, and prestige. Further, many papers (e.g., Dhaliwal et al. 2011; Cormier et al. 2013, 2014) show that CSR engagement expands the set of market participants (e.g., institutional investors and financial analysts) who collect private information about firm's future prospects. If the presence of analysts and institutional investors may attract more noise trading to the stock instead of private information, this will reduce the content of relevant information in stock prices even when firms increase their disclosure, which may result in an ambiguous impact on total information in the market. Overall, the neutral and the absence of a negative relationship between CSR and firm's transparency indicates that Canadian firms' managers do not use CSR opportunistically to extract private benefits.

Our work suggests several avenues for future research. First, it seems important to explore the different channels available for dissemination of CSR activities. We argue that it is relevant to

examine the impact of each dimension separately. Results based on combined scores could be different from those based on individual scores. Second, some of our results show that firms having high S scores are considered more credible and transparent, while those having high E and G scores do not enjoy such benefits. It might be fruitful to explore in future research the mechanisms underlying such differences in the market participants' perceptions of the S dimension relative to the E and G dimensions. Finally, the present analysis can be extended internationally because it is possible to witness cross-country variations in the relationship between CSR and firm's transparency based on differences in institutional and cultural factors.

REFERENCES

- Akerlof, G. (1970). The market for 'lemons': qualitative uncertainty and the market mechanism. *Quarterly Journal of Economics* 85, 488-500
- Barnea, A., & Rubin, A. (2010). Corporate social responsibility as a conflict between shareholders. *Journal of Business Ethics* 97, 71-86.
- Baron, D. P. (2001). Private politics, corporate social responsibility, and integrated strategy. *Journal of Economics & Management Strategy* 10, 7-45.
- Beaver, W., Lambert, R., & Mosse, D. (1980). The information content of security prices. *Journal of Accounting and Economics* 2, 3-28.
- Bhattacharya, S. (1979). Imperfect information, dividend policy and 'bird in the hand' fallacy. *Bell Journal of Economics* 10, 259-270.
- Carroll, A.B. (1998). The four faces of corporate citizenship. *Business and Society Review* 100, 1-7.
- Cespa, G., & Cestone, G. (2007). Corporate social responsibility and managerial entrenchment. *Journal of Economics and Management Strategy* 16, 741-771.
- Collins, D.W., Khotari, S.P. (1989). An analysis of intertemporal and cross-sectional determinants of earnings response coefficients. *Journal of Accounting and Economics* 11, 143-181.
- Collins, D. W., Khotari, S.P., Shanken, J., & Sloan, R.G. (1994). The lack of timeliness and noise as explanations for the low contemporaneous returns-earnings association. *Journal of Accounting and Economics* 18, 289-324.
- Cormier, D., & Magnan, M. (2013). The economic relevance of environmental disclosure and its impact on corporate legitimacy: an empirical investigation. *Business Strategy and the Environment*
- Cormier, D., & Magnan, M. (2014). The impact of social responsibility disclosure and governance on financial analysts' information environment. *Corporate Governance: The International Journal of Effective Board Performance* 14, 467-484
- Cui, J., Jo, H., & Na, H. (2012). Does corporate social responsibility reduce information asymmetry? Working paper. Korea University.
- Dhaliwal, D., Li, O., Zhang, A., & Yang, Y. (2011). Voluntary nonfinancial disclosure and the cost of equity capital: the initiations of corporate social responsibility reporting. *The Accounting Review* 86, 59-10.
- Deng, X., Kang, J., & Low, B. S. (2013). Corporate social responsibility and stakeholder value maximization: Evidence from mergers *Journal of Financial Economics* 110, 87-109.
- Durnev, A., Morck, R., Yeung, B., & Zarowin, P. (2003). Does greater firm-specific return variation mean more or less informed stock pricing? *Journal of Accounting Research* 41, 797-836.
- Eccles, R., Ioannou, I., & Serafeim, G. (2011). The impact of a culture of sustainability on corporate behavior and performance, Harvard Business School and NBER Working Paper Series.
- Fisman, R., Heal, G., & Nair, V.B. (2006). A model of corporate philanthropy. Working paper, Columbia University, New York.
- Freeman, R. (1984). Strategic management: a stakeholder approach. Massachusetts: Pitman Publishing Inc.
- Freeman, R. (1987). The association between accounting earnings and security returns for large and small firms. *Journal of Accounting and Economics* 9, 195-228.
- Freeman, T., & Hasnaoui, A. (2011). The meaning of corporate social responsibility: the vision of four nations. *Journal of Business Ethics* 100, 419-443
- Friedman, M. (1970). The social responsibility of business is to increase its profits. New York Times, 122-126.
- Fuller, J., & Jensen, M. (2002). Just say no to Wall Street: Courageous CEOs are putting a stop to the earnings game and we will all be better off for it. *Journal of Applied Corporate Finance*, 14, 41-46.

- Gelb, D., & Strawser, J.A. (2001). Corporate social responsibility and financial disclosures: an alternative explanation for increased disclosure. *Journal of Business Ethics* 33, 1-13
- Gelb, D., & Zarowin, P. (2002). Corporate disclosure policy and the informativeness of stock prices. *Review of Accounting Studies* 7, 33-52.
- Harjoto, M., & Jo, H. (2011). Corporate governance and CSR nexus. *Journal of Business Ethics* 100, 45-67.
- Healy, P.M., & Palepu, K.G. (2001). Information asymmetry, corporate disclosure, and the capital markets: a review of the empirical disclosure literature. *Journal of Accounting and Economics* 31, 405-440.
- Hemingway, C., & MacLagan, P. (2004). Managers' personal values as drivers of corporate social responsibility. *Journal of Business Ethics* 50, 33-44.
- Jensen, M., & Meckling, W. (1976). Theory of the firm, managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3, 305-360.
- Jo, H., & Harjoto, M. (2012). The causal effect of corporate governance on corporate social responsibility. *Journal of Business Ethics* 106, 53-72.
- Jo, H., & Kim, Y. (2007). Ethics and disclosure: a study of the financial performance of firms in the seasoned equity offerings market. *Journal of Business Ethics* 80, 855-878.
- John, K., & Williams, J. (1985). Dividends, dilution and taxes: a signalling equilibrium. *Journal of Finance* 40, 1053-1070.
- Hart, S. L. (1995). A natural resource based view of the firm. *Academy of Management Review*, 20, 986-1014.
- Hess, D. (2008). The three pillars of corporate social reporting as new governance regulation: disclosure, dialogue, and development. *Business Ethics Quarterly* 18, 447-482.
- Hong, H., & Kacperzyk, M. (2009). The price of sin: the effects of social norms on markets. *Journal of Financial Economics* 93, 15-36.
- Ioannou, I. & Serafeim, G. (2012). What drives corporate social performance? The role of nation-level institutions. *Journal of International Business Studies*, 1-31.
- Jensen, M. (2002). Value maximization, stakeholder theory, and the corporate objective function. *Business Ethics Quarterly*, 12, 235-256.
- Knyazeva, D., (2007). Corporate governance, analyst following, and firm behavior. *Working paper*, New York University.
- Lundholm, R., & Myers, L.A. (2002). Bringing the future forward: The effect of disclosure on the returns-earnings relation. *Journal of Accounting Research* 40, 809-839.
- McWilliams, A. & Siegel, D. (2001). Corporate Social Responsibility: A Theory of the Firm Perspective. *Academy of Management Review*, 26, 117-127.
- Petrovits, C. (2006). Corporate-sponsored foundations and earnings management. *Journal of Accounting and Economics* 41, 335-361.
- Prior, D., Surroca, J., & Tribo, J. (2008). Are socially responsible managers really ethical? Exploring the relationship between earnings management and corporate social responsibility. *Corporate Governance* 16, 160-177.
- Qiu, Y., Shaukat, A. & Tharyan, R. (2014). Environmental and Social Disclosures: Link with Corporate Financial Performance. *British Accounting Review*, DOI:10.1016/j.bar.2014.10.007
- Russo, M. V., & Fouts, P. A. (1997). A resource-based perspective on corporate environmental performance and profitability. *Academy of Management Journal*, 40, 534-559.
- Servaes, H., & Tamayo, A. (2013). The impact of corporate social responsibility on firm value: the role of customer awareness. *Management Science* 59, 1045-1061.
- Ullmann, A. (1985). Data in search of a theory: A critical examination of the relationships among social performance, social disclosure, and economic performance. *Academy of Management Review*, 10, 540-577.
- Van Marrewijk, M. (2003). Concepts and definitions of CSR and corporate sustainability: Between agency and communion. *Journal of Business Ethics* 44, 95-105.
- Verrecchia, R. (2001). Essays on disclosure. *Journal of Accounting and Economics* 32, 97-180.
- Warfield, T.D., & Wild, J.J. (1992). Accounting recognition and the relevance of earnings as an explanatory variable for returns. *The Accounting Review* 67, 821-842.
- Whitehouse, L. (2006). Corporate social responsibility: Views from the frontline. *Journal of Business Ethics* 63, 279-296.
- Wood, D. J. (1991). Corporate social performance revisited. *Academy of Management Review* 16, 691-718.
- Yu, F. (2008). Analyst coverage and earnings management. *Journal of Financial Economics* 88, 245-271.

Corporate investment, debt and liquidity choices in the light of financial constraints and hedging needs

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Abstract: We examine Anns' simultaneous choice of investment, debt financing and liquidity in a large sample of US corporates between 1980 and 2014. We partition the sample according to the Anns' financial constraints and their needs to hedge against future shortfalls in operating income. In contrast to earlier work, our joint estimation approach shows that cash flows affect the corporate decisions of unconstrained Anns more strongly than those of constrained Anns. Investment-cash flow sensitivities are particularly intense for unconstrained Anns with high hedging needs. Investment opportunities (as proxied by Q), however, play a larger role for constrained Anns with the effects being strongest in case of low hedging needs. Interestingly, constrained Anns with low hedging needs are found to employ more debt to finance their investment opportunities and build up significant cash holdings at the same time. Our results hence indicate overinvestment behavior for unconstrained Anns but no underinvestment for constrained Anns if they have low hedging needs.

JEL Classification: G31, G32

Keywords: Cash flow sensitivity, investment, debt issuance, cash holdings

THE ROLE OF ESG ISSUES IN THE INVESTMENT DECISIONS OF SUPERANNUATION FUNDS IN AUSTRALIA

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Abstract: *Superannuation funds in Australia, with around \$1.84 trillion invested in 2014, are major stakeholders in company investments. It is likely then that the level of importance they place on environmental, social and governance (ESG) matters would have a significant impact on the role of ESG in company policy. We undertook interviews with investment managers of superannuation funds in Australia to learn what role ESG issues play in their investment decisions. There was a large range of inclusion from playing a major role in all investments to being used as a first pass indicator of good management of the company to be invested in. All indicated a significant increase in the importance of ESG in the last five years. The issues which dominated the discussions were to divest or not, their level of engagement with the companies, stranded assets and overall investment philosophy. Our research finds they are becoming more active investors with increased engagement directly with the companies, through voting at the annual general meetings and direct discussions with management and the boards. The superannuation fund managers have also found an increasing level of engagement from members to invest responsibly despite the level of investment in core responsible investment portfolios at just 2.34% in 2013.*

Keywords: *Investments, ESG, Superannuation funds*

LOAN DEFAULT RATES DERIVED FROM NON-PERFORMING LOAN RATES

Dobromił Serwa

Warsaw School of Economics default rate, non-performing loans, housing loans, banking sector

***Abstract:** This research is the first attempt to calibrate default rates of loan portfolios with the use of raw data on nonperforming loans and some additional information on the maturity structure of the loan portfolios. We apply a simple model of loan quality, controlling for loan maturities and dynamics of loan supply. Results for nine national aggregate indices of nonperforming housing loans in the Czech Republic, Greece, Ireland, Hungary, Latvia, Poland, Portugal, Romania, and Spain reveal strong differences in the dynamics of calibrated default probabilities between countries. Calibrated default rates are correlated with macroeconomic factors, but the linkages depend on the markets investigated.*

MEASURING NOMINAL YIELD RISK: THEORY AND AN APPLICATION TO THE LOAN BOOKS OF US BANKS

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Abstract: *I present a model for describing the dependence of financial intermediary net worth and net cashflow on the term to maturity structure of nominal interest rates. I show how the model nests the approaches in three strands of the literature. Such a model can be used to predict the change in net worth caused by a change in nominal interest rates. I show how to quantify the uncertainty in this change in net worth that arises from term structure parameter estimation and measurement error in accounting data. I apply the methods to measure the losses due to revaluations of the loan book at each of \$10,759\$ US banks, and of the aggregate loan book of the banking system, between 2005 and 2010 in response to increases in the short term nominal interest rate. Point estimates of the sensitivity of the value of the loan book to changes in the term structure of nominal interest rates display some cyclicalities, peaking just before the onset of the financial crisis and reaching their lowest levels at the end of the sample. Standard errors due to parameter estimation uncertainty can be wide and therefore should not be ignored.*

Keywords: *interest rate risk, term structure, systemic risk, net worth*

RISK MITIGATION IN THE CASE OF SHADOW BANKING

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Abstract. *Issue of shadow banking system became a global phenomenon originating from the U.S.A due to financial crisis. It is believed by many researchers that interest rates were kept too low for too long by the Federal Reserve Bank in the early year 2000. This, of course, has caused credit boom in the economy. Thereby, this situation led to the post-2007 financial and economic crisis. However, low interest rates during boom period of early 2000s were not the only reason for the financial crisis. In fact, many academicians and policy-makers raised an argument that the crisis was the end result of the interaction of micro and macro factors. It is true that shadow banking system bears the same risk as banks. As stated by Financial Stability Board (2011a), shadow banking system raises concern about systemic risk and concerns about regulatory arbitrage. After FSB 2010, 2011, and 2012 reports, (FSB) published final policy documents on Strengthening Oversight and Regulation of Shadow Banking in August 2013 in order to mitigate potential systemic risks associated with shadow banking. Based on the FSB recommendations, aim of this research is to search for alternative approach to risk mitigation in order to address potential systemic risk associated with shadow banking.*

Keywords: *Financial Crises, Banks, Investment Banking, Risk, Regulation*

CORPORATE GOVERNANCE AND BANK PROFITABILITY: LESSONS FROM NIGERIA

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Abstract: *Corporate governance is the framework by which the various stakeholder interests are balanced or the relationships among the management, board of directors, and others are monitored. It is argued that lack of good corporate governance in banks is responsible for excessive risk taking and irresponsible lending that often result in huge non-performing loans and the erosion of shareholders funds. Studies show that almost 60 percent of failed banks had board members who either lacked banking knowledge or were uninformed and passive regarding supervision of their banks affairs. It is suggested that a strong bank managing director and a weak board of directors are a recipe for weak corporate governance. Weak corporate governance became a major global concern of banks before and after the global financial crisis between 2007 and 2009 for bank management. Despite the difficult times banks that embraced the basic principles of good corporate governance continued to make profit and growing stronger today. Nigeria that was not isolated from the global financial tsunami boasts of its oldest bank that prides itself in banking excellence based on strong corporate governance ethics. The survey research design was used for the study. Data generated were organized before they were analyzed. Based on the analysis of data, it was found that corporate governance has strong positive relationship with bank profitability.*

Keywords: *Non-performing loans, Global financial crisis, Banking knowledge, Shareholders' funds, Stakeholders, Cadbury report, Board of directors, Good corporate governance, First Bank, Liquidity, Bonus, Tsunami.*

Introduction

Corporate governance is a term now used in more frequency to describe the way business organizations are managed. The corporate governance code of ethics embraces all aspects of a given organization from the top to bottom. Corporate governance is crucial for judicious and prudent management of resources. This is imperative because a bank generates a profit from the differential between the level of interest it pays for deposits and other sources of funds, and the level of interest it charges in its lending activities. In any business, including the business of banking, profitability is the term used to express the amount of money a business earns above and beyond what it spends for the provision of goods or services. The management of a bank's loan portfolio remains a challenge in today's banking environment. Loans are a bank's primary source of profitability, and banks require a high dose of corporate governance influence to avoid the creation of non-performing loans that lead to bank losses. In the context of banking, non-performing loans are those loan assets not-generating income or profit. Loans are often categorized to be non-performing when principal or interest on them is due and left unpaid for 90 days or more. This however, varies from place to place, and from time to time. According

to Greuning and Bratanovic (2003) corporate governance relates to the manner in which the business of the bank is governed, including setting corporate objectives and a bank's risk profile, aligning corporate activities and behaviours with the expectation that the management will operate in a safe and sound manner, running day-to-day operations within an established risk profile, while protecting the interests of depositors and other stakeholders. Corporate governance is defined by a set of relationships between the bank's management, its board of directors, its shareholders, and other stakeholders. In formulating policies the board of the bank must ensure that such policies, will enable the bank earn maximum profit for the benefit of its shareholders and other stakeholders. Three economic goals guide the strategic direction of almost every business organization. According to Pearce 11, and Robinson, Jr (2003) whether or not the mission statement explicitly states these goals, it reflects the firm's intention to secure survival through growth and profitability. Profitability is the mainstay of a business organization. No matter how profit is measured or defined, profit over the long-term is the clearest indication of a firm's ability to satisfy the principal claims and desires of employees and shareholders. The growth of a business is tied inextricably to its survival and profitability. Pearce 11, and Robinson Jr. (2003) emphasize the importance of "corporate regard for growth", and state that studies show a positive correlation of corporate regard for growth and profitability. Corporate governance is fundamental for new opportunities with an acceptable rate of long-term growth and profitability, and acceptable degree of risk, and compatibility with the dreams of shareholders and other stakeholders of a bank. Generally, governance is the sum of the many ways and manners individuals and institutions, whether private or public manage their common affairs, it is a process through which conflicting or diverse interests of people may be accommodated and collective measures taken. Governance is a broad, dynamic, complex process of interactive decision making that is constantly evolving and responding to changing circumstances. Interest in the area of corporate governance is placed at the heart of global agenda since the beginning of big business failures within Big Multinational Corporations such as Enron, Parmalat, Bank of Credit and Commerce International, which showed that the functioning of certain elements of 20th century corporate governance models were not able to ensure maximization of shareholders interests, corporate growth and profitability. Carrillo, (2007) believes that corporate governance is an alternative way of efficiently conducting corporate activities to protect shareholders and other stakeholders interests in business. According to him, corporate governance is related to expansion of democratic ideas. He also states that 16th Century manufacturers developed codes of conduct, which underlined their corporate goal to serve public interest. Carrillo (2007) emphasizes that recent corporate governance theories revolve around the maximization of shareholders interest and revenue, and sometimes include corporate social responsibility, corporate citizenship, corporate accountability, or social and financial reporting. Corporate governance, therefore, deals with the business organization and its decision making structures. One of its major objectives is to ensure the efficient confluence of otherwise diverse and competing interests and compliance with relevant regulatory framework to ensure the growth and profitability of the business organization such as a bank. According to Cadbury (1992) corporate governance is "the system by which companies are directed and controlled". It is the framework by which the various stakeholders interests are balanced or the relationship among the management, board of directors, controlling shareholders, minority shareholders and other stakeholders. Corporate governance involves a set of relationships between a company's management, its board, its shareholders and other stakeholders. The concept of corporate governance is integrity perceived which underlines its importance as the tool by which corporate integrity can be encouraged, measured and protected. The global financial quagmire which started to manifest in the late 1980s brought into sharp global attention the need for good corporate governance for the growth, survival and profitability of financial institutions. It is argued that lack of good corporate governance was a major reason for the global financial crisis. The lack of good

corporate governance culture, especially, in banks encouraged excessive risk taking, and irresponsible lending that resulted into huge non-performing loans (NPLs), erosion of shareholders funds, huge operating expenses, and losses. Otherwise, good corporate governance should provide proper incentives for the board and management of a bank to pursue the objectives that are in the best interest of shareholders and other stakeholders, and equally facilitate effective monitoring. It is envisaged that it is not in the best interest of a bank to go out of business or to be bailed out by government. The bank failure syndrome that accompanied the global financial crisis was a manifestation of the lack of good corporate governance by the failed banks. Stating the importance of corporate governance is another way of saying that good corporate governance is actually just good management, and that a failure of corporate governance is a failure of management. According to Cornett, et al (2011) liquidity at banks dried up during the financial crisis of 2007-2009, because interbank markets froze, and illiquidity peaked in the fourth quarter of 2008, and banks that had no credible corporate governance structure and embarked on irresponsible lending became loss centres and collapsed. In Nigeria, for example, many banks collapsed during the period mainly due to corporate governance breaches. There were several instances where board members and management failed to uphold and promote the basic pillars of sound corporate governance because they were preoccupied with the attainment of narrowly defined personal interests (Soludo – 2006). The case of corporate governance breaches in the Nigerian banking system was endemic that the Central Bank of Nigeria had to order a special audit of all the banks in 2009. The report showed that most of the banks in Nigeria were exhibiting signs of collapse, as a result of major failures in corporate governance. The situation deteriorated through 2011, and it took the Asset Management Company of Nigeria (AMCON) about N5.67trillion to protect depositor's interests when all the mismanaged and unprofitable banks failed between 2009 and 2011. (Okorie & Uwaleke, 2010, Sanusi, 2010, Anumihe, 2015). While many banks failed in Nigeria like a pack of cards, some corporate governance compliant banks survived till today. One of such surviving and profitable banks is First Bank which incidentally is the oldest bank in Nigeria. The bank boasts of a robust corporate governance structure which it advertised in 2007. The bank has remained profitable over the years, including the period of global financial crisis when big financial empires failed. A study of First Bank corporate governance structure and bank profitability is a good lesson on corporate governance and bank profitability from Nigeria. As Nigeria's largest and most enduring financial services institution, First Bank has continued to score many firsts. In 2011, First Bank was recognized by African Bankers Magazine as the Most Innovative Bank in Africa and in 2012 First Bank was named Nigeria's number one banking brand by Brand Finance. First Bank is also the first institution in Nigeria to achieve globally acclaimed certifications in ISO27001 Information Security Management Systems, ISO38500, IT governance and BS25999 Business Continuity Management Systems. The bank has continued to win awards for excellence based on sound corporate governance. The fact that achieving banking excellence requires insightful leadership, skilled, focused and active management, underscores the imperatives of sound corporate governance. By embracing corporate governance culture, First Bank has chosen the path to business prosperity (Onasanya, 2012).

Responsibility of the Board of Directors

The primary responsibility of the Board of Directors of any company is to ensure that the company is managed by efficient and competent individuals. Since management can make a big difference between less profitable and more profitable businesses, directors are expected to institutionalize a culture of sound corporate governance. Banks through the Board of Directors formulate policies that are implemented by management for the growth, stability and profitability of their banks, which policies should conform with the principles of good corporate

governance. In furtherance of this, the roles of the chairman and managing director/chief executive officer in the bank should be separated. While the chairman leads and manages the board, the managing director and chief executive officer leads the management team for the ever important day-to-day management of the bank. This makes room for necessary checks and balances that would minimize the incentives for mismanagement and collapse of banks as witnessed in the late 1980s and throughout the 1990s. According to McNaughton (1997) corporate governance, characterized by proper conduct, control, and professional management should mean that banks are prudently run and meet regulatory standards and laws. External auditors and bank regulators may verify that a bank comes up to regulatory stretch but owners and directors are responsible for running the bank. The composition, role, responsibility and accountability of the board influence bank behavior. She opines that of all bank failures in the United States of America, 60 percent had weaknesses in the their boards, including lack of banking knowledge as well as passive bank supervision. In addition to good corporate governance, banking excellence requires good management. Although an exact definition of good management is difficult to formulate, observable aspects exist and proficiency in their execution can be evaluated. Success in banking business requires leadership and competency in strategic analysis, planning, policy making and in the management function, intrinsic to the business of banking. While the bank failure rate in the USA is not good, in the case of Nigeria, almost all the failed banks had weaknesses in corporate governance and displayed poor management. Financial globalization requires standardized assessment, analysis, and management of financial risks in the field of banking, in an attempt to provide a high-level framework relevant to the current realities of changing economies and global financial markets. This approach emphasizes the accountability of key players in the corporate governance process in relation to the management of different dimensions of banking business. In recent decades, liberalization and the volatility of financial markets increased competition and diversification that expose banks to new risks and challenges requiring the continuous innovation of ways to manage banking business and its associated risks so as to remain competitive. However, the ultimate responsibility for the way in which a bank's business is conducted lies with the board of directors. The board has to set the strategic direction, appoint management, establish operational policies, and most importantly, take responsibility for ensuring the soundness of the bank. Executive management of a bank has to be "fit and proper," meaning not only that managers subscribe to standards of ethical behavior but also that they have the competence and experience necessary to run the bank. Because the management is responsible for the implementation of the board's policies through its running of the bank on a day-to-day basis, it is vital that it has intimate knowledge of the financial risks that are being managed. To be effective, the board often sets up various committees as an extension of its management policy function. Corporate governance provides a disciplined structure through which a bank sets its objectives and the means of attaining them, as well as monitoring the performance of those objectives. Good corporate governance encourages a bank to use its resources more efficiently. Generally, corporate governance relates to the manner in which the business of the bank is governed, including aligning corporate activities and behaviours with the expectation that the management will operate in a safe and sound manner in the interests of depositors and stakeholders. It is defined by a set of relationships between the bank's management, its board, its shareholders, and other stakeholders. Bank management is the responsibility of major key players in the corporate governance structure. Each major player is accountable for a dimension of bank management. Key elements of sound corporate governance in a bank involves a well articulated corporate strategy against which the overall success and contribution of individuals can be measured, setting objectives and enforcing clear assignments and responsibilities, maintaining a strong and coherent management team, corporate values and culture, providing managerial incentives to act in an appropriate manner by the board, management and employees, enforcing transparency and disclosure of relevant information internally and to the

general public (Greuning & Bratanovic, 2003). The broad idea of corporate governance is never to produce legislation but to encourage self-regulation with the ultimate aim that in applying the principles, the bank will become more efficient, gain shareholder value, and hopefully increase market value as a result. But during the global financial crisis of 2007 – 2009, when liquidity dried up some global banks jettisoned corporate governance principles and resorted to rather unethical banking methods as survival strategy. The cases of banks in the Abacha transactions in 1998 and beyond cannot be completely said to have been transparent in view of the time and circumstances, surrounding the transactions (Kaufmann, 2002, Levi, et al, 2007). Corporate governance through the protection of a wider set of interests can be regarded as an alternative way of efficiently conducting good management. Taking into consideration other stakeholders' interests is often regarded as fairly recent in development in view of the recent commitments of global companies like General Motors and Ford toward the promotion of corporate excellence. Balance between the different groups of stakeholders is essential to the long-term viability of the business enterprise. Fair and balanced stakeholder's perspective results in long-term premium value. Good corporate governance to a high degree serves to reconcile otherwise opposing interests (Carrillo, 2007). In the case of Nigeria the case for good corporate governance is further strengthened by the desire to attract investments to support rapid economic growth, because the spate of high profile corporate frauds and bank failures witnessed across the globe since the 1990s helped to focus attention to the dangers of weak corporate governance systems. Among the heavy cases include those of the Bank of Credit and Commerce International, Barings Bank, Enron and WorldCom. These cases demonstrate that there is a strong link between the quality of corporate governance practices and corporate performance in the banking industry. (Ayininuola, 2007, Ajekigbe 2004, 2007).

Statement of the problem

Distress in the Nigerian banking sector remained a malignant cancer throughout the 1990s until 2011. Previous studies indicate that the Nigerian banking system distress was a function of several variables such as lack of good corporate governance and poor management of banking institutions. Frauds and malpractices, bad asset composition, deterioration of credit risk portfolio, adverse macroeconomic policies and economic recession and political instability among other factors contributed to the instability in the sector. Because of profound poor bank management resulting from lack of good corporate governance regime, the regulatory authorities of the Central Bank of Nigeria (CBN) and the Nigeria Deposit Insurance Corporation (NDIC) placed most sick banks under various Interim Management Boards (IMBs) to work out modalities for their survival, restructuring or complete liquidation. However, the Federal Ministry of Finance raised the paid-up capital base of banks, because the imagination was that more banks could be liquidated if mergers and acquisitions fail to provide the required life line. The Nigerian Banking sector consolidation programme was aimed at strengthening the financial system against wide spread distress (Soludo, 2004, 2006). The business of banking is financial intermediation through the mobilization of funds for on-lending at a price both within and outside the economy of any country. Within the Nigerian public and business perspectives, banks are seen as special economic entities that together assume a unique position in the financial market. The other competing nonbank financial institutions like the insurance companies do not receive this type of special attention by both the private and public sectors. Because of the importance attached to the role of banks, any nation often expects much from the banking sector. This precisely caused the panic with which the Nigerian public reacted to the multiple problems that faced and upset the business of banking during the banking crisis, mostly as the result of poor corporate governance culture and poor management system. Yahaya (1998) opines that there is no more controversy about the impact of an unstable political environment on business activities and also financial intermediation, but laments that the post-

independence socio-political terrain in Nigeria had not been conducive to banking business as the banking legislation moved back and forth between regulation and deregulation that equally contributed largely in the fragility of the banking system. Topically, the obvious absence of good corporate governance culture and poor management rather than weak democratic governance were responsible for the banking system upheaval in Nigeria, especially in the last quarter of the 20th Century. With the spread of good democratic governance, and as the world becomes more of a global village, good corporate governance manifested in good bank management holds the olive for a sound banking arrangement in Nigeria. This is true because the business of banking has not been the best one during the 20th Century. Today, the terrain is getting more difficult and dangerous as the years go by. Again with the challenges of financial globalization, economic integration of different regions, information and communication-technology, consumer rights and choices, regulatory demands and options, it appears that the business of banking needs a heavy dose of good corporate governance and good management to meet the high expectations of its multiple stakeholders. Customers still endure the inefficient product packaging and poor service delivery systems of the banking sector despite interbank competition, but the essence of good corporate governance and good management would mean a significant new paradigm shift towards a sound banking system. As a way forward, a new National Code of Corporate Governance has been proposed for Nigeria, a development that may see far reaching changes in the composition of board and management and operations of companies in the country. The new code will make provision that one third of members of a board of directors should be independent non-executive directors, noted for responsible business conduct, which will ensure that companies/banks go beyond technicalities to prove that their operation have no negative impact on the environment. The new approach is to address several short comings and loopholes in the existing codes and regulatory frameworks with a view to generally enhancing the corporate governance standards in Nigeria in consonance with the provisions of the Organization for Economic Co-operation and Development (OECD). To strengthen the banking system the Financial Reporting Council (FRC) faults the Central Bank of Nigeria's Board composition, saying it breaches International corporate governance principles. The FRC believes that for good corporate governance regime to be in place, the governor of the CBN cannot be the chairman of the CBN Governing Board and at the same time the Chief Executive Officer (CEO) of the apex bank. The FRC is a unified independent accounting, auditing, valuation and corporate governance practitioner in public and private sectors of the Nigerian economy with robust arrangements for monitoring and enforcing compliance with financial reporting standards in Nigeria, with a view to increasing board, management and operational credibility, more long-term investments, lower cost of capital, improved access to new capital and higher share values (Salako, 2013, Nweze, 2013). Although Nigeria has a sad history of bank failures dating back to 1960s, the bank failure syndrome of the 1990s until 2011 was progressively influenced by bad bank management and inept corporate governance culture. The financial crisis of 2007-2009 which was the biggest shock to the global financial system since the 1930s brought about the worst liquidity dry-up and offers a unique challenge to both bank management and regulators in terms of corporate governance and liquidity risk management (Cornett, et al, 2007). These symptoms were ignored by some banks in Nigeria that engaged in reckless operations without regard to laid down banking principles that would help in safeguarding the interests of stakeholders. In terms of reckless lending, bank promoters and top executives of failed banks were involved in excess of about N125bn (Ugoani, 2013). The poor governance practices in the Nigerian banking industry was compounded by the fact that some promoters and operators resorted to unethical and unprofessional practices in a bid to survive the stiff competition in the financial market. To appreciate the failure of corporate governance in the Nigerian banking system, prior to 2004, for example, the banking sector comprised 89 banks, many of which were characterized by low or eroded capital base, bad bank management and weak corporate governance, insolvency as evidenced by negative

capital adequacy ratios and capital that had been significantly eroded by losses, over dependence on public sector funds, and income from foreign exchange trading, and huge non-performing credits. A major outcome of the 2004 banking sector reform in Nigeria was the emergence of 25 well capitalized banks. However, due to bad management and poor corporate governance practices, the challenges in the banking sector did not abate even after consolidation. In furtherance of the Central Bank of Nigeria's statutory duty to ensure a sound banking system all the banks were examined following site reports of signs of imminent collapse. To save some of them from collapse, the Central Bank of Nigeria had to inject N420bn into them, while simultaneously replacing their management with interim ones. As the problems of illiquidity and bad management persisted, the CBN injected another N200bn, to support the sick banks making a total rescue package of N620bn, and this led to the sacking of the boards of all the sick banks by the CBN in a bid to strengthen corporate governance in Nigerian banks (Ayininuola, 2007, Sanusi, 2010, Okorie & Uwaleke, 2010). A move toward good corporate governance practice would mean that the regulatory authority should have the ability to screen access to ownership and management to prevent individuals lacking professional qualifications, experience, financial backing, and sound ethical standards from obtaining a banking license (Barltrop & McNaughton, 1997, Nwaze, 2006, Obieri, 2014). Corporate governance problems were pervasive in the whole financial system that led to the near collapse of the capital market between 2008 and 2009. According to Oteh (2012) corporate governance breaches contributed to the problems of the capital market in Nigeria. She states that "There were incidences of financial skimming, misappropriation, false accounting, misrepresentation, and questionable transactions". According to her, in 2009, N1.7bn of the 2008 operational surplus was distributed to council members, in violation of the Companies and Allied Matters Decree (1990) and Security and Exchange Commission's rules which preclude the Nigerian Stock Exchange (NSE) from such because NSE is a company limited by guarantee. Also, Report of an inspection of the NSE was shocking and included weak corporate governance, risk management, and internal controls, insufficient oversight of brokerage firms and listed companies, and inability to enforce its rules.

Objective of the Study

The study was designed to explore the relationship between corporate governance and bank profitability.

Scope of the Study

The study was delimited to Abia State. Abia State is one of the 36 states in Nigeria. It was therefore assumed that any result obtained from a study of this nature in Abia State would be a true representation of a result from Nigeria.

Limitations of the Study

The study was constrained by lack of research grant. Again, because of the vast area of Nigeria, it was not easy to extend the study to other areas. However, these constraints did not impair the academic quality of the study.

Significance of the Study.

Time like this when business organizations are mismanaged due to the absence of corporate governance, students, researchers, policy makers, and the general public stand to benefit through gaining insight into the imperatives of corporate governance and bank profitability.

Hypotheses

To achieve the objective of the study, two hypotheses were formulated and tested at 0.05 level of significance.

Ho: There is no relationship between corporate governance and bank profitability.

Hi: There is a relationship between corporate governance and bank profitability.

Literature Review

Since the beginning of business failures and the recent global financial crisis the matter of corporate governance has continued to attract the attention of investors and the general public. In the banking system for example, it is argued that financial risk management is the responsibility of several key players in the corporate governance structure. Each key player is accountable for a dimension of risk management. According to Greunning and Bratanovic (2003) the key players are regulators and lawmakers, managers, shareholders, directors, internal auditors, external auditors and the banking public. They opine that to the extent that any key player does not, or is not expected to fulfill its function in the risk management chain, other key players have to compensate for the gap created by enhancing their own role. Often, it is the regulators who step into the vacuum created by the failure of certain players. This is because banks are susceptible to many forms of risks which have triggered occasional systemic crises. Risks include liquidity risk, credit risk, and interest rate risk, which is a risk that a bank will become unprofitable if rising interest rates force it to pay relatively more on its deposits than it receives on its loans. The potential for this is often exacerbated by weak corporate governance and regulatory oversight of banks and in some cases inept management. This was the case in Nigeria in 2009 when the Central Bank of Nigeria discovered critical gaps in regulatory frameworks and regulations, weak supervision and enforcement, unstructured governance and management processes at the Central Bank of Nigerian and weakness in the business environment in the country. According to Okorie and Uwaleke (2010), 2009 special audit revealed that five banks were in grave danger. To save the five banks from imminent collapse, the CBN had to inject N420billion into them as tier – 2 capital, while simultaneously replacing their management with interim ones. As more banks became technically distressed, the CBN injected another N200billion to support those banks, making a total of N620billion rescue package for the ailing banks in the Nigerian banking system. The CBN also guaranteed foreign loans to Nigerian banks as well as provided guarantee for interbank placement from July 2009 to March 2010 in the first instance with an extension to December, 2010. The report state that while replacing the Chief Executive Officers (CEOs) of troubled banks, the CBN in a bid to strengthen corporate governance in banks limited the tenure of managing directors to a maximum of ten years (Sanusi, 2010).

Important Developments in corporate governance during the global financial crisis.

The period of the global financial crisis between 2007-2009 was very critical for the banking industry particularly in the United States of America and Europe. And in every case, many important questions were raised about the quality of corporate governance in banks. Until this time, there have been no official conclusions about what actually went wrong in the banks, but some of the developments provide interesting lessons in corporate governance and bank management. The first major event in the banking industry during the crisis in the United Kingdom was probably the fall in 2007 – 2008 of Northern Rock, a bank specializing in mortgage loans. The bank had expanded its business aggressively, making extensive use of short term funding in the wholesale money markets. When the wholesale markets virtually collapsed, the bank was unable to refinance its operations. In 2008, the bank was taken over by

the government to prevent is insolvency. Other banks reported huge losses from their operations in 2008. Again, in the United States of America, a number of investment and deposit banks crashed, notably among them was Lehman Brothers, in the United Kingdom, the government took over large equity stakes in two major banks, including taking a controlling interest in the Royal Bank of Scotland. These catastrophic events raised serious questions about the quality of corporate governance, board of directors and management of the banks. The lesson here would appear to be that the banks had incompetent boards and management that made it easy for the death of their banks. In the United Kingdom, Barclays Bank avoided the need for government capital from Middle Eastern investors. Some shareholders and other stakeholders of the bank became worried about the effect of such a measure on their own investment in the bank. This concern led to the decision by the bank for the re-election of the entire board at an Annual General Meeting (AGM) in 2009. This suggests that the board of directors were aware of their accountability to the shareholders and other stakeholders. This lesson in corporate governance with regard to accountability and transparency is important for bank survival and profitability. For banks to survive, questions were asked about why the directors of banks continued to receive huge amounts of bonuses and pay, even when their banks were performing so poorly, and in some cases needed government bailout. This equally led to leading bankers in the UK and USA agreeing to forgo their entitlements as a survival strategy for their banks during the crisis. Even though the principle of good corporate governance suggests that directors should be adequately remunerated it also states that the board of directors should exercise leadership and integrity so as to achieve continuous prosperity for the corporation. Banks that survived the financial quagmire did exactly that. During this period evidence of unethical or illegal practices in banks and other financial institutions also emerged. In 2009, the USA government announced that it was investigating nine European Banks. The nine banks were suspected of assisting customers from other countries such as Iran and the Sudan to transfer huge amounts of money through the US banking system, in violation of US laws. Lloyds TSB admitted to helping clients in this way and agreed to pay a fine of US\$350million. The banking and investment industry were also rocked in late 2008 by news of a US\$5 billion fraud by the investment firm of Mr. Bernie Madoff. These were among the classic breaches of the corporate governance code that helped in driving many hitherto healthy banks and other financial institutions into early involuntary collapse (ICSA, 2009)

Contemporary corporate governance breaches in Nigerian banks

The banking industry in Nigeria is at present in a state of transition because of the gradual movement toward full market liberalization as the world becomes more of a global village. There are still weaknesses in terms of customer service delivery resulting from lack of requisite competencies and a strategy to remain competitive. In the present century and beyond, a positive move toward good corporate governance arrangement holds the olive branch for corporate performance. Good corporate governance provides the framework through which corporate objectives are set and performance monitored and determined. It enhances efficient corporate culture and balances the interests of the various stakeholders. The ultimate objective of good corporate governance is building public confidence. In essence, it is believed that good corporate governance consists of a system of structures for controlling and operating the company so as to achieve a culture based on a foundation of sound business ethics, fulfilling the long-term strategic goals of the owners, while taking into account the expectations of all the key stakeholders such as employees, past, present and future, excellent relations with customers and suppliers as well as the needs of the environment and the whole local community. With globalization vastly increasing the scale of trade and the size and complexity of businesses, and the bureaucracies constructed in attempt to control it, the importance of corporate governance and internal regulation is being amplified as it becomes increasingly difficult to regulate

externally. The recent global financial crisis of 2007-2009 has refocused attention on some burning issues in the banking system mostly related to the integrity of the board and management of banks, the bonus culture and the external regulatory framework. Worries have been expressed whether the board and management of banks carry out their duties in tandem with the principles of corporate governance and whether the bonus culture in most banks complies with better corporate governance requirements in financial institutions and their remuneration policies in the face of dwindling profitability. Also at the apex level, it would appear that the introduction of more regulations have not achieved a fine result, probably due to lack of capacity and competence on both sides of the regulator and the regulated. This lack of competence and capacity presupposes that rapid reduction in non-performing loans and rapid growth in profitability are associated with corporate governance best practices. But this was absent in the Nigerian banking sector in the 1990s and over. For example, in 1993 25 banks collapsed as a result of poor management, low profitability, productivity, liquidity, asset quality, and frauds. In 2009, 10 of the 24 banks in the country became technically distressed, leading to the sacking of the CEO and executive directors (EDs) of the banks. Some of them were jailed for corporate governance breaches and fraud (Caprio & Klingebiel, 2002). In fact, the problem in the banking sector was a spillover of the corporate governance breaches in the larger financial system. According to Ote (2010), the Nigerian capital market has been characterized by governance weaknesses that led to improper behaviours and sharp practices such as insider trading and share price manipulation.

The integrity of the board and management

Corporate governance means different things to different people. Some regard it as honesty, decency and fairness, otherwise it is a technical term used by accountants, lawyers, managers, and other professionals to denote compliance with both statutory and internal regulatory requirements. The topical issue today is whether the board and management of banks is possessed of integrity in the eyes of the general public. This is the spirit of corporate governance in setting down relevant rules to prevent innocent managers from being misled by greedy promoters and directors. It is the lack of integrity on the part of the board and management of banks that led to massive bank failures in Nigeria in the 1990s and in to the 2000s. Some of the promoters, directors, and top managers of the failed banks are still entertaining the courts on issues bordering on bad management, lack of integrity and corporate governance (Ugoani, 2013, Unachukwu, 2011, Omonode, 2013). And it is this integrity – perceived and actual that underlies the very importance of corporate governance, as it is the tool by which integrity in banking business can be encouraged, measured, projected and sustained. For example, it was reported that the chairman of Ecobank agreed to step down on December 31, 2013 after board members had decided his departure was necessary to restore confidence among depositors and shareholders after a drawn-out controversy and board room battle, over governance issues (Ebhodaghe, 2013, Jibueze, 2011, Alli, 2011, Ogidan, 2013). This began when Nigeria's central bank wrote to Ecobank in April drawing attention to the chairman's alleged failure to repay debts to the bank set up in Nigeria in the wake of 2009 banking crash to absorb nonperforming loans. At the heat of the financial crisis, Nedbank provided Ecobank the \$285 million loan to buy Oceanic International Bank in 2011. The deal is valued at more than \$500m. The episode does not fully capture the rudiments and vision of sound bank management which involves not only contending with the daily issues relating to keeping the bank ahead of competition, but also with more general matters of the banking industry and the economy of the country, thus gaining the equilibrium for profitability.

The bonus culture

The recent global financial crisis brought into sharp focus the system of bonuses and remuneration operated by financial institutions. It is argued that the expectation of very high business leads to excessive risk-taking and irresponsible lending by bank executives. Combined with the complex financial instruments that are constructed to move the risk off their books, contribute to liquidity squeeze in the system. Even though the principles of good corporate governance acknowledge that incentives should be provided for the board and management to pursue objectives that are in the best interests of the corporate body and its stakeholders, such must be done in a very transparent manner so as to gain public confidence. Instances where the directors and top managers of sick banks receive high bonuses and pay in form of a “parachute” is inconsistent with the principles of good corporate governance. For example, in 2013 the Chief Executive Officer of Ecobank following allegations of breaches in corporate governance agreed to forgo US\$1.14m bonus he was to earn for the 2012 financial year as part of multiple efforts to rebuild public confidence in the bank against the back drop of accusations of maladministration, fraud and technical incompetence (Udunze, 2013).

Regulatory Framework

The importance of good corporate governance could be restated as the importance of good management. Put in such a simple perspective, it would mean that good corporate governance and good management combine to produce good result, through proper regulatory framework. While banking reforms are part of regulatory framework, the regulators often openly admit that they do not in some cases understand the complex financial instruments that ultimately folded in on themselves and lead to the collapse of the banking system. Constructing new regulations to try to control circumstances that are yet to emerge may be a futile task. Today, the systemic headwind blowing within the Nigerian financial sector is far from abating despite recent reforms in the industry as latest report by the Central Bank of Nigeria show that corporate governance and risk management breaches continue to threaten the safety of funds in the sector (Udunze, 2014, Moghalu, 2011). While the banks in the country are expected to operate a monocline banking or holding company model, many of them are in a state of flux and are yet to get their act together. Multiple regulations may not lead to sanity in the banking sector, but adherence to corporate governance guidelines and the Basel 111 proposals would help sick banks out of the woods. Yusuf (2012) reports that First Bank is ready for the new banking model, and has “attained a status which presupposes that it leads by example all the time”. Regulators need to bear in mind that soundness indicators for deposit taking institutions like commercial banks include the measure of capital adequacy, asset quality, earnings and profitability, liquidity and sensitivity to market risk. This will help in hedging the risk of bank failure (Boughton & Bradford, 2007, Kose, et al 2007, Soludo, 2004).

Lessons in Bank Corporate Governance in Nigeria

The necessity for the establishment of a sound banking system became very urgent in view of corporate governance breaches that lay at the heart of the recent global financial crisis. It is now hotly argued that good corporate governance is required for banks to protect the interests of stakeholders. According to Greuning and Bratanovic (2003) corporate governance provides a disciplined structure through which a bank sets its objectives and the means of achieving them, as well as monitoring performance of these objectives. They posit that good corporate governance encourages a bank to use its resources more effectively and efficiently. It is envisaged that efficient application of resources results in bank profitability. Profitability is an indicator of a bank’s capacity to carry risk and to increase its capital base. Greuning and

Bratanovic (2003) insist that profitability is a revealing indicator of a bank's competitive position in banking markets and the quality of its management. It allows a bank to maintain a certain risk profile and provides a cushion against short-term problems. Given the traditional narrow margins of interest rates spread within which banks operate and which ultimately affects profitability, while many banks failed in Nigeria in recent times others that embrace the culture of sound corporate governance remain profitable. One of such banks is First Bank. The oldest bank in Nigeria, First bank has a robust corporate governance structure which it advertised in 2007. Despite financial turbulence over the years, the bank has remained profitable, including making profits during the heat of the global financial crisis between 2007 – 2009. For example, the bank's profit after tax (PAT) rose from N16.053m in 2006 to N18,355m in 2007 (Ajekigbe, 2007). The bank remained profitable through the financial system quagmire in Nigeria until 2013 when it made a profit after tax of N29,280m. (Borodo, 2014). In introducing its corporate governance structure to the public in 2007, the bank states. "Since companies governance issues moved to the centre of popular discourse in the wake of the governance failures, which ushered in the new millennium, the nature of the ensuing debate has changed significantly. In part, a large measure of the worries that have been expressed around post corporate governance issues in the country have arisen in the light of the fundamental restructuring of the country's economy. Reforms to the economy may have tilted the balance of operating risks to the upside, but at the same time, these changes to the structure and management of the economy have increased local business vulnerabilities to regulatory and legislative risks. Organizations reputations and the integrity of their board promises are the two biggest corporate values at risk going forward. At First Bank, our internal discussions around these themes have focused on the changes to the bank's governance structure necessary to align it with the increasingly dynamic character of the country's financial markets and the growing integration with global financial capital. This challenge is as much about how we can best protect minority shareholders as part of a larger process of legislative and regulatory reform, as it is about newer and higher disclosure levels that increase the Bank's local responsiveness across its large domestic footprint. It is equally about reconciling our reporting frameworks with the ongoing attempts to implement International Financial Reporting Standards around much of the world. We have no doubt that the emergent governance dynamics will place renewed stress on increasing the scope of audit and other internal control and risk management activities within the Bank, while increasing both the depth and scale of public scrutiny of business practices. In anticipation of these changes, First Bank has consistently focused on shareholders rights, their role(s) in the management of the Bank, appropriate disclosure and transparency levels, as well as how to strengthen the board of directors in the exercise of its oversight responsibility. In tandem with the highlight of its governance structure, the Board is responsible to shareholders for creating and delivering sustainable shareholder value through its oversight of the Bank's business. In this respect, the roles of the chairman and the managing director and chief executive officer (CEO) are different and separate. The main responsibility of the chairman is to lead and manage the Board to ensure that it operates effectively and fully discharges its legal and regulatory responsibilities. Nonexecutive directors based on the breadth and depth of their knowledge and experience, are able to consider, challenge, monitor and approve strategies and policies recommended by the managing director/chief executive officer. The Bank asserts that in line with best practices, ongoing reforms to the Bank's corporate governance framework reach beyond the board's obligation to provide strategic guidance to the bank, and to effectively monitor management, to stress the need for local responsiveness by the board. According to the bank, the key challenge in this regard is ensuring the board's accountability to shareholders. And as representative of shareholders the board delegated the responsibility, for the day-to-day management of the bank to the managing director and chief executive officer, who is supported in this task by the executive committee which he chairs. According to the bank's corporate governance structure, the board of directors is specifically responsible for determining the

bank's objectives and strategies as well as plans to achieve them, determines the terms of reference and procedures of the board committees, maximizing shareholder values, considering and approving annual budgets, ensuring that an adequate budgetary and planning process exists, approving, among others, acquisitions, mergers, etc, ensuring effective risk management, sound reporting processes, and having ultimate responsibility for systems of financial, operational and internal control and regulatory compliance. It also ensures that statutory reporting of these is adequate. The board carries out these responsibilities through various committees such as: executive committee (general) executive committee (credit), board tenders committee, board nominations & remuneration committee. With a very wide pool of shareholders and highly diversified stakeholders, through sound corporate governance, the bank is able to leverage on the vast experiences of members of the board and management in driving the bank in the paths of growth, stability and profitability. With a formidable corporate governance culture the equity of the bank grew steadily over the years. For example, it grew from N351M in 2013 to N385M in 2014 respectively. This provides credible evidence that corporate governance is an important element of bank soundness. Even under full government regulation or ownership, a professional management team can turn around a damaged bank and make it commercially attractive. It all requires an exercise in building a sound risk management infrastructure – a functional organization, proper segregation of duties, consolidated credit functions, and a management that provides balance sheets and profit and loss statements on a timely basis (Kang, 2004). Among the most important measures of bank profitability is return on equity. Thus, with rising shareholders' equity First Bank is almost assured of continuous profitability. According to Onasanya (2012) First Bank is the largest banking institution in Nigeria, and easily one of Africa's largest financial services institutions. He states that the bank has evolved a new structure that will enhance the bank's competitiveness, and result in the "creation of a corporate centre with responsibility for setting strategic direction, providing group wide oversight and ensuring the leveraging of synergies across the group through the constitution of a governing board and committees at the group level to optimally align corporate governance and management roles". He asserts that the new structure would further enliven the performance of the bank, which has doubled profit in recent years. For example, the financial result as at the period ended June 30, 2012 showed that net profit doubled by 124.6 percent to N46.01billion as against N20.48billion posted in the comparable period of 2011. Gross earnings grew by 25.6 percent to N182.30billion compared with N145.09billion in the corresponding period of 2011. Operating income increased to N74.2bn in 2012 compared with N49.4bn in 2011. Profit before tax (PBT) stood at N28.9bn in 2012 as against N14.3bn in 2011, an increase of about 101.6 percent. Customer's deposits also rose by about 31.1 percent from N1.6 trillion in 2011 to N2.1trillion in 2012. At the heart of the improved performance lies good corporate governance initiatives that were implemented to enhance operating efficiencies, organizational productivity and bank profitability. Bank performance ratios such as shareholders equity and profitability are affected by the market conditions in which a bank operates, including macrofinancial policies, prudential regulations and accounting standards, competition and business practices. First bank demonstrates the capacity for superior bank earnings. Bank earnings provide internal capital formation and they are needed to attract new investor capital which is essential if the bank is to grow. They serve both as a demonstration of management's effectiveness and as a barometer of the effects of macrofinancial policies on banking institutions. Healthy profits are needed to absorb loan losses and to build adequate provisions. A consistent earnings performance builds public confidence in the bank. Many bankers believe that public confidence in their bank is their most valuable banking asset, since it allows them to minimize funding costs and provides access to the best borrowers. Thus consistent healthy earnings are essential to the sustainability and viability of banking institutions. In effect, sound bank earnings are the lubricant that allows the bank to continue functioning. (Barltrop and McNaughton, 1997).

Accordingly to Ibrahim (2012) as a sign of recovery from the 2009 crisis that shook the sector to its foundation, the banking industry in Nigeria has been recording impressive performances, with the shareholders' funds rising to N2.3tn in 2012. The total shareholders' fund of the 20 Deposit Money Banks that survived the banking sector crisis of 2009 rose by N434.24bn from N1.934tn in 2011 to N2.369tn in 2012. The shareholders' fund is the balance sheet value of its ownership structure and it shows the amount by which a company is financed through equity and retained earnings. The balance sheet, apart from giving an indication of the health of a bank, also serves as a financial snap shot of all the assets and liabilities of the financial institution. The 22.44 percent rise in shareholders' funds is attributed to the activities of AMCON, especially the purchase of the nonperforming loans of the banks. Good corporate governance structure ensures that procedures, policies, and practices of a bank are aligned with regulatory requirements, business strategy, operations and risk appetite, in quest of profitability. According to Anuforo (2015) the Group Managing Director/Chief Executive Officer of First Bank, Onasanya states: "First Bank begins the year on a positive note in spite of the uncertainties in the operating environment with a 12.3 percent year-on-year increase in profit before tax at N21.9 billion, reinforcing the resilience of our business. We are committed to further driving operational efficiencies".

Methodology

Research Design

The survey research design was used for the study. The study design was chosen to illustrate the complexity associated with the study. According to Stapenhurst and Kpundeh (1999) surveys provide insights in society's ethical standards, and focus on improving performance by defining it in terms of the public's experiences. It is useful in describing the characteristics of a large population or a particular subset of the population, such as the business community. Surveys are oriented towards ascertaining and establishing the status quo, facts or pieces of information at the time of the research and presenting such facts as they are or going further to analyze. Surveys, therefore, could either be descriptive or analytical. The instruments are mostly observation, measurements, counting, administration of questionnaire copies, and interviews (Obodoeze, 1996).

Population and sample

The population comprised of all the banks in Nigeria. The sampling was purposive to obtain the balance needed to achieve the objective of the study. The sample size was based on the 1/10th principle.

Data collection tools and methods

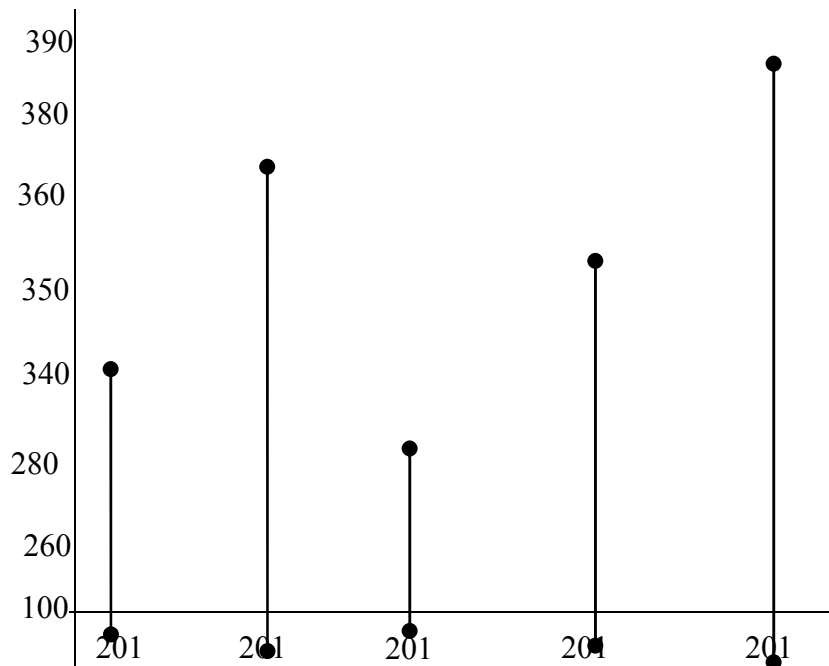
The study chose a mixed method approach. Qualitative and quantitative data collection methods and tools helped to provide comprehensive information for the study. Systematic field work preparation and secondary data collection bolstered primary data collection. Primary data were collected based on the Background Questionnaire to Facilitate Analysis of Banks developed by Greunning and Bratanovic (2003), redesigned along a 5-point Likert-type scale, with 20 questions. The Likert scale is used for item analysis and has been previously validated and found to be internally consistent.

Data analysis

Data were analyzed through descriptive and correlation statistical methods. Specifically, quantitative data were processed and analyzed with Statistical Package for the Social Sciences (SPSS). The results were presented in tables:

Presentation of Data and Results

Table 1: First Bank's 5 Year's shareholders' Equity Profile (N' M)



Source: Author Field work, 2015

Correlations

(DataSet0)

Table 2: Descriptive Statistics

Measures	Mean	Std. Deviation	N
Corpt Gov.	.04	1.251	5
Bank PR	6.48	2.253	5

Table 3: Correlations

Measures		Corp. Gov.	Bank profit
Corp. Gov.	Pearson's Correlation	1	.901*
	Sig. (1-tailed)		.018
	N	5	5
Bank Prof	Pearson's Correlation	.901*	1
	Sig. (1-tailed)	.018	
	N	5	5

*Correlation is significant at the 0.05 level (1-tailed).

Interpretation of correlation result

Correlation coefficient in table 3 was $r = .901^*$. This proved that there is significant positive relationship between corporate governance and bank profitability at 0.05 level of significance. Therefore, H_0 which stated that corporate governance has no relationship with bank profitability was rejected. The result supports the findings of Pearce, II, and Ribinson, Jr. (2003) that corporate regard is correlated with organizational profitability.

Discussion

This study provides evidence in support of existing literature to suggest that excellence in banking could be achieved through good corporate governance. In contrast the banana banking regime in Nigeria in the 1990s and beyond was exacerbated by bad management and indifference to the principles of corporate governance. Bad bank management could be avoided through regular on-site and off-site surveillance by the regulatory authorities. However, supervisory authorities cannot guarantee that banks will not fail, because the potential for bank failure is an integral part of risk-taking. Regulators have a role to play, but there is a difference between their role in the day-to-day supervision of solvent banks and their handling of sick banks in order to prevent contagion and / or systems crisis. The option should be when approaching systemic issues, the key concern of regulators will be to address threats to public confidence in the financial system and contagion to otherwise sound banks. The regulators major responsibility is to make adequate arrangements that could facilitate the exit of problem banks with minimum disruption to the system at the same time the methods applied should minimize distortions to market signals and discipline. Individual bank failure on the other hand is an issue for bank management and shareholders. In some cases bank failure and bailout exercise may become a political issue, especially in the case of public banks, and involve decisions whether, to what extent, and in what form public funds should be committed to turning the situation around. But bailout exercises like the primitive injection of about N700bn public funds into sick banks, in Nigeria, which did not enjoy full public support, and tend to jeopardize the integrity of the regulatory authorities should be avoided. Despite the independence of regulators they must perform their duties in such a way that will protect them from personal and institutional liability for actions taken in good faith. Regulators should be obliged to co-operate and share relevant information with both bank management, stakeholders and other relevant bodies both at home and abroad so as to strengthen arrangements for improving the quality of their action and protecting the confidentiality of information available. Corporate governance is the system by which corporations are directed and controlled to enhance performance and long-term shareholder value. Therefore, like the First Bank

experience, the board's mix, size and composition must be in line with the guidelines required by credible regulatory code. The number of non-executive directors should exceed that of the executive directors. The board members should possess the requisite business experience and knowledgeable about financial matters. The roles of the chairman of the board and the managing director must be clearly defined and separated and the board chairman should not be a member of any board committee, so as to ensure credibility and transparency of decisions. Good corporate governance is the process by which the board of directors working through management guides a bank in fulfilling its corporate mission and safe guarding the bank's assets. Fundamental to good corporate governance is the ability of individual directors to work in partnership so that they can balance long-term strategic and short-term operational responsibilities. Good corporate governance occurs when a board provides proper guidance to management's efforts to move in that direction. The interplay between board and management centres on this relationship between strategy and operation both of which are essential for the performance of the bank. (Akpala, 2011). Board of Director is composed of a group of people who formulates a company's policies and decisions and selects its management team. The duty of the Board of directors is very significant for good corporate governance practice. For example, shareholders are expected to elect the Board of Directors, delegate their authority to the directors so elected, and appoint external auditors with the responsibility of auditing the bank annually. On the other hand, the role of the board of directors encompasses spelling out the policies that would guide management in running the affairs of the bank. When considering periodic reports by management the board must also ensure that laid-down policies have been complied with. Not all the banks comply with these basic requirements. This is one reason why some banks fail while others survive. The banks that stood the heat of the times are the ones that comply with good corporate governance structures. In the face of the 2007-2009 global financial crisis when many banks rumbled and died, First Bank stood even stronger. After over 120 years in the business of banking in Nigeria, First Bank believes that it has attained a status which presupposes that it leads by example all the time. First Bank good corporate governance model emphasizes that the Bank consistently focuses on shareholders rights, their role(s) in the management of the bank, appropriate disclosure and transparency levels, as well as how to strengthen the board of directors in the exercise of its oversight responsibility. The importance and relevance of sound corporate governance cannot be overemphasized because according to Greuning and Bratanovic (2003), almost 60 percent of failed banks had board members who either lacked banking knowledge or were uninformed and passive regarding supervision of their banks' affairs. A strong managing director and weak board are a recipe for disaster. A Board with a strong nonexecutive chairman is more likely to be able to provide objective inputs than a board whose chairman is also the chief executive officer. A bank requires a board of directors that is both strong and knowledgeable. It is important that the board encourages open discussion and even more important, that it tolerates conflict well, since conflict indicates that both sides of the coin are being considered. Failed banks almost always certainly suffer from deficiencies in their board and senior management. The leadership provided by the board of directors of many failed banks had frequently been found to be ineffective both in scope and depth. To ensure the growth and profitability of a bank, the board must be strong, independent, and actively involved in its bank's affairs. The executive management must adhere to high ethical standards. This is crucial because the most important duty of the board of directors is to ensure that the management team has the necessary skills, knowledge, experience and sense of judgment to manage the affairs of the bank in a sound and responsible manner that results ultimately to profitability. Corporate governance breaches continue to unsettle the global financial system despite the harsh lessons of the last global financial crisis. Gabriel (2015) reports that five major banks, including Barclays, Citigroup and Royal Bank of Scotland, have been fined a record \$5.7billion (£ 3.7bn) for rigging foreign exchange markets in the latest

scandal to engulf the banking industry. According to the US the banks had exhibited “breathtaking flagrancy” setting up a group they called “the cartel” to manipulate a market valued at \$5trillion a day. The manipulation of foreign exchange by these banks affects countries like Nigeria which is highly import dependent. Nigeria may have lost billions of dollars through this process as banks in Nigeria have correspondence banking affiliation with most of the banks involved. The new fines are a second wave of punishments for fixing foreign exchange markets. Six major banks were fined £2.6bn in November, 2014. This takes the total penalties to £6.3bn. Barclays which was hit by the UK regulators biggest ever fine, will fire eight employees. Citicorp, JP Morgan, Chase & Co, Barclays Plc, and the Royal Bank of Scotland Plc, have agreed to plead guilty to conspiring to manipulate the price of US dollars and euros exchanged in the foreign currency exchange spot market and that the banks have agreed to pay criminal fines totaling more than \$2.5billion. Also, another bank, UBS, AG, has agreed to pay a \$203m criminal penalty for manipulating the London Interbank Offered Rate (LIBOR). These historic frauds are the latest in corporate governance breaches and show the extent to which such actions and inactions can have negative effects on the global economy and bank profitability, because these huge fines represent absolute losses to the individuals’ banks.

Recommendations

- i) For effective corporate governance regime, there should always be a distinction between bank regulators and the regulated. This is important to allow the regulatory agencies like the CBN exercise control without fear or favour.
- ii) Bank Boards should be comprised of people with sound knowledge of banking. It is important to avoid over loading bank boards on the basis of political patronage because it often results in inefficient boards.
- iii) Government should check executive remuneration or package in the banking system. Research has shown that the executive directors in many banks enjoy heavy bonuses while the majority of the employees get paltry sums. Harmonizing the packages may help to reduce the level of insider frauds in the banking system.
- iv) Credit risk management practice in Nigerian banks is poor. A situation where the government through AMCON is spending N5.67trillion to protect depositors interest is alarming. Banks should embrace sound credit risk management culture for the growth and profitability of banks in Nigeria because high NPLs lead to bank failure.
- v) Integrity of the board is critical for bank profitability. The CBN should institute a policy of thorough examination of the profiles of those aspiring to top bank management and board positions to ensure that they are not ex-fraudsters. The bank failure experience in Nigeria showed that some board members only came to liquidate their banks for personal gains.

Scope for further study

Further study could examine the relationship between corporate governance and weak regulation. This may reveal the reasons why regulators often fail to exercise effective oversight functions.

Conclusion

The wide spread banking sector crisis in the 1990s and beyond was largely due to management and corporate governance failures. Issues of integrity of the board coupled with weak regulatory mechanism were common place and therefore provided the incentives for irresponsible management and leadership. While regulation sets the framework for banking operations it has no magic wand to stop bank failure as the question of sound and unsound banking practice rests

with the board and management of individual banks. Good corporate governance consists of a system of structures for achieving excellence in banking as demonstrated by banks such as First Bank that has remained stable and profitable over the years despite financial crises. This study provides additional theoretical imperatives to existing literature in support of the importance of good corporate governance in bank management excellence. The study found strong positive relationship between corporate governance and bank profitability. The result of this study supports the views of Ayinimuola (2007) that there is a strong link between the quality of corporate governance practices and corporate performance in the banking industry. This is the crux of the study.

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References

- Ajekigbe, J.M. (2004) My Vision for First Bank. The First Banker Special Edition, Lagos, First Bank pp: 1-23.
- Ajekigbe, J. M (2007) Corporate Governance: First Bank of Nigeria Plc Annual Report & Account: Experience & Enterprise, Lagos, pp: 46-53.
- Akpala, P.E, (2011) Management and Governance in Microfinance Bank. Microfinance Certification Programme, The CIBN Press Limited, Lagos. Pp: 58.
- Alarape, A. (2012) Where is Cecilia Ibru's Loot? Daily Sun, Vol. 7, No. 2382, pp: 1&3.
- Alli, Y, (2011) Ex-Bank PHB Boss Atuche Surrenders to EFCC. The Nation Tuesday May 17, pp: 53
- Anuforo, C, (2015) FBN grosses N126.8bn in earnings. Daily Sun, Vol. 10, No. 3131, pp. 58.
- Anumihe, I, (2013) Only 10 Banks are sound says NDIC. Daily Sun, Vol. 10, No. 2614, pp: 57.
- Anumihe, I (2015) You Bungled Banking Consolidation Left N5.67trn Liability CME Accuses Soludo. Daily Sun, Vol. 10, No. 3067, pp: 58-59.
- Ayhan Kose, M, Prasad, E, Rogoff, K, and Wei, S, (2007) Financial Globalization: Beyond the Blame Game. Finance and Development, Vol. 44, No. 1, pp: 9-19, IMF, Washington, D.C.
- Ayininuola, S.I (2007) Leadership, in Corporate Governance. Union Digest Vol. 11. Nos. 1 & 2, pp:10-16.
- Bartrop, C.J. and McNaughton, D. (1997) Banking Institutions in Developing Markets Interpreting Financial Statements. Vol. 2, The World Bank, Washington, D. C.
- Borodo, (2014) First Bank Unaudited Financial Results for the Half Year Ended June, 30, 2014 The Guardian Vol. 31, No. 13003, pp: 7
- Boughton, J. M and Bradford, C.I Jr. (2007) Global Governance: New Players, New Rules. Finance and Development Vol. 44, No. 4, pp: 10-14, IMF, Washington, D.C.
- Cadbury, A. (1992) Corporate Governance Report, U.K.
- Caprio, G and Klingebiel, D. (2002) Episodes of Systemic and Borderline Banking Crises In D. Klingebiel and L, Laeven (eds) Managing the Real and Fiscal Effects of Banking Crises. The World Bank, Washington, D.C, pp:31-48.
- Carrillo, E. F. P. (2007) Corporate Governance: Shareholders' Interests' and other Stakeholders' Interests'. Vol. 4, Issue 4, pp: 96-102
- Cornett, M. M. McNutt, J. J, Strahan, P.E and Tehranian, H. (2011) Liquidity Risk Management and Credit Supply in the Financial Crisis: Journal of Financial Economics 101, pp:297-312.
- Ebhodaghe, S (2013) Nedbank to acquire one-fifth of Ecobank in December. National Daily. Edition 407, pp: 19.
- Gabriel, O (2015) US Fines 5 Big Banks \$5.7bn. The Vanguard, Vol. 25, No. 62409, pp: 14.
- Greuning, H, and Bratanovic S. B (2003) Analyzing and Managing Banking Risk. A Framework for Assessing Corporate Governance and Financial Risk. 2nd edition. Washington, D. C. The World Bank.
- Ibrahim, U, (2012) Bank Shareholders' funds hit N2.37tr in 2012 NDIC Annual Report and Statement of Accounts, Abuja.
- Institute of Chartered Secretaries and Administrators (2009) An International History of Corporate Governance, Oxford, UK.
- Ikhilae, E (2011) Hearing begins in bank Ex-ED Legal Tussle. The Nation Tuesday, May 17, pp 34.

- Jibueze, J (2011) Akingbola Urges Court to Halt Trial. Accuses EFCC of Intimidation: The Nation Tuesday May, 17, pp: 5.
- Kang, C, (2004) The Korean CEO who managed Seoul Bank's restructuring and successful Privatization in 2000-02 recounts his experience Finance and Development, Vol. 41, No. 2, pp: 44-46.
- Kaufmann, D. (2002) Governance in the Financial Sector: The Broader Context of Money Laundering and Terrorist Financing. Washington, D. C. The World Bank.
- Levi, M, Dakolias, M and Greenberg, T, (2007) Money Laundering and Corruption/ In: J.E Campos and S, Pradhan (eds) Many Faces of Corruption. Tracking Vulnerabilities at the sector level. The World Bank, Washington, D.C, pp:389 – 426.
- McNaughton, D. (1997) Banking Institutions in Developing Markets. Building Strong Management and Responding to Change Vol. 1, The World Bank Washington, D. C.
- Moghalu, K. C (2011) Central Banking in Emerging Economies: Challenges, Successes, and Prospects. The Guardian Vol. 29, No. 11922, pp: 69.
- Nwaze, C, (2006) Bank Fraud Exposed with Cases and Preventive Measures, 1st edition. Control and Surveillance Associates Ltd. Lagos.
- Nweze C, (2013) Council Faults CBN Board Composition. It's Improper for Governor to be Chairman. The Nation, Vol. 8, No. 2701, pp: 34.
- Obieri, R. (2014) Inside Story of our Battle with Sanusi – Raymond Obieri, Ex-Chairman of International Bank. Daily Sun, Vol. 10, No. 2830, pp: 61&64.
- Obodoeze, F.O (1996) Modern Text Book of Research Methodology. Academic Publishing Company, Enugu.
- OECD (1999) Principles of Corporate Governance. Paris.
- Ogidan, A, (2013) Ecobank Group appoints Essien as New CEO. The Guardian Vol. 30, No. 12858, pp: 16.
- Okorie, G. and Uwaleke, U.J (2010) An Overview of Financial Sector Reforms and Intermediation in Nigeria. Central Bank of Nigeria Bullion, Vol. 34, No. 2, pp:19-29.
- Omonode, D. (2013) NDIC Indicts EFCC over collapsed Gulf Bank – Goes after Babajide Rogers, Prince Adekunle Adeyegba Johnson, Others. National Daily, Edition 407, pp: 1 and 11.
- Onasanya, B. (2012) Nigeria: The Path to Prosperity. First Bank, Bi-Annual Journal of Business and the Economy Vol. 2, Issue 1, pp: 1
- Onasanya, B. (2012) First Bank: New Structure, Greater Values. The Nation, Vol. 7, No. 2246, pp. 33.
- Oteh, A. (2010) A Roadmap for Transforming the Nigerian Capital Market Press, briefing. SEC Media Center Lagos, Friday, 05 February 2010, pp:3.
- Oteh, A (2012) How Capital Market Collapsed, by Oteh. The Guardian, Vol. 29, No. 12185. Pp: 1-3.
- Pearce II, J.A, and Ribinson, Jr. R.B (2003) Strategic Management. Formulation, Implementation and Control. 8th edition, USA, McGraw Hill, Irwin.
- Salako, T. (2013) New Governance: One-third of Directors Must be Non-Executive. New Code Takes Off Q1 2014. The Nation Vol. 8, No. 2701, pp: 36.
- Sanusi, L.S (2010) The Nigerian Banking Industry: What went wrong and the way forward. Being the full text of a convocation lecture delivered at the Annual Convocation Ceremony of Bayero University Kano, Nigeria.
- Sheng, A. (1996) Bank Structuring: Lessons from the 1980s. Washington, D. C, The World Bank.
- Soludo, C.C (2004) Consolidating The Nigerian Banking Industry to meet Development Challenges of the 21st Century. Address delivered at the Special Meeting of The Bankers Committee, Abuja, July.
- Soludo, C. C (2006) The Outcome of The Way Forward For The Under-Capitalized Banks, Press Conference, Abuja.
- Staphenhurst, R, and Kpundeh, S. J (1999) Curbing Corruption: Toward a Model for Building National Integrity. The World Bank, Washington, D.C.
- Sundarajan, V, and Balino, T.J.T (1992) Banking Crisis: Structural Weaknesses, Support Operations and Economic Consequences. Washington, D.C. IMF.
- The Guardian (2011) Editorial: Nationalization of Banks Vol. 29, No. 11922, pp:14.
- Udunze, B. (2013) Ecobank's CEO Foregoes \$1.14m Bonus. Daily Sun, Vol. 10, pp:55.
- Udunze, B. (2014) Banks Survive Regulatory Stress Test Amidst Tense Corporate Governance Challenge. Daily Sun, Vol. 10, No. 2964, pp: 25-28.
- Ugoani, J.N.N (2013) Poor Credit Risk Management and Bank Failure in Nigeria. SSRN <http://ssrn.com/abstract=2185013>
- Unachukwu, J.A (2011) Shareholders Lose Bid to Stop Sale of Sick Banks. The Nation, Tuesday, May 17, pp: 32.
- Yahaya, M, (1998) The Shape of Banking in the 21st Century. Daily Champion, Wednesday, February 4, 1998.
- Vittas, D, (1992) Financial Regulation: Changing the Rules of the Game. EDI Development Studies. Washington, D.C The World Bank Economic Development Institute.
- Yusuf, I, A (2012) Will Banks Meet May Deadline to exit Universal Banking? The Nation, Vol. 06, No. 2068, pp: 57.

THE USE AND DESIGN OF INCENTIVE SYSTEMS IN NONPROFIT ORGANIZATIONS AND THEIR RELATION TO NONPROFIT MANAGEMENT CONTROL SYSTEMS – EVIDENCE FROM AUSTRIA

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***Abstract:** In the context of NPO, the use of incentive systems is controversially discussed; especially the question whether pay-for-performance-routines can be transferred from the for-profit-context is much disputed. Whilst proponents claim that potential benefits similar to those in the for-profit-context might arise, opponents argue that deterring effects such as the crowding-out of intrinsic motivation might seriously harm the entire organization. Nevertheless, consensus exists that the use of incentive systems requires their careful adaption to the specifics of the nonprofit-context and has to consider including elements such as implicit incentives; and that these questions also gain importance considering the advancement of management control systems in NPO.*

583 Austrian NPO were extracted from the data base of the Austrian Controller Institute and contacted. Employing a standardized questionnaire which was distributed online, 58 NPO answered to all of the questions and thus could be included in the results of this study. Most of these organizations were large social service providers organized as associations or private limited company and primarily financed by public authorities or private beneficiaries.

The findings show that 28 % of the NPO being included in the sample already have established incentive systems for their top management. In most of these organizations, these incentive systems employ financial incentives such as bonuses. Besides that, a variety of non-financial incentives is employed. These NPO were characterized by the following factors: low dependency on public funds; little reliance on the intrinsic motivation of employees; competitive and expansive organizational culture; further developed management control systems.

Introduction and problem statement

Applying the principal-agency-framework to the context of NPO is considered to offer viable solutions to governance-issues for these organizations as well (e.g. Speckbacher, 2008; Jegers 2011: 51 ff.; already refer to Jensen & Meckling 1976). One way of addressing the agency-problems in the center of this framework is by aligning the diverging interests of management and owners/stakeholders by means of monitoring and remuneration systems that include e.g. pay-for-performance elements. This directly affects various elements of management control systems employed within these organizations.

In the context of NPO, the use of incentive systems is controversially discussed; especially the question whether pay-for-performance-routines can be transferred from the for-profit-context is much disputed. Whilst proponents claim that potential benefits similar to those in the for-profit-context might arise, opponents argue that deterring effects such as the crowding-out

of intrinsic motivation might seriously harm the entire organization (Krönes 2008; Helmig & Boenigk 2012: 127; Schober et al. 2013: 254 f.). Nevertheless, consensus exists that the use of incentive systems requires their careful adaption to the specifics of the nonprofit-context and has to consider including elements such as implicit incentives (Theuvsen 2004; Speckbacher 2013); and that these questions also gain more and more importance considering the advancement of management control systems in NPO (Horak & Baumüller 2013).

Empirical findings on the use of incentive systems in NPO are scarce for German-speaking countries (as well as beyond these) – notable exceptions are the studies by Brandl & Güttel (2007) and Jacobi (2013). Both focus on the employment of pay-for-performance schemes and show that such incentive systems are employed in the nonprofit-sector; however, they seem to be more the exception than widespread practice. Several determinants seem to impact the application of such schemes: perceived degree of competitiveness regarding funding and service provision; degree of strategic freedom; clarity of strategic objectives; existence of management instruments; and organizational culture (Brandl & Güttel 2007).

However: Whilst the first study by Brandl & Güttel (2007) focusses on a qualitative study of a few large Austrian NPO, the second study by Jacobi (2013) covers only limited insights on the prevalence of variable remuneration elements in Swiss NPO. A larger-scale quantitative study covering the determinants and potential impact of the use of incentive systems in NPO is missing. Furthermore, the perspective of management control systems and the impact of these incentive systems on goal setting as well as resource allocation have not been included so far.

Research questions, study sample and methodology

Given the lack of quantitative studies on the use of incentive systems in NPO, this study aims at finding answers to the following questions:

Q1: What is the practical relevance of incentive systems in NPOs and what forms do they take? Esp.:

- What types of financial incentives are employed?
- What alternatives to financial incentives are employed?
- What role do implicit mechanisms play?

Q2: To what extent do incentive systems differ for certain levels of hierarchy within NPOs – e.g. top-level management and workforce?

Q3: To what extent are the views developed by literature on the chances and risks of incentive systems shared by managers within NPOs?

Q4: To what extent do the overall organizational aims match the aims set forth on the level of employees e.g. by means of incentive systems? This question deserves special attention given the problems in respect to the finding of key performance measures for NPOs.

This study aims at being the most comprehensive study on incentive systems in NPOs so far and aligning the results to the appropriate design of management control systems within these organizations. Thus, it contributes to the effective and efficient use of resources endowed to them.

In total, 583 Austrian NPO were extracted from the data base of the Austrian Controlling Institute and contacted. Employing a standardized questionnaire (30–40 minutes) which was distributed online, 58 NPO answered to all of the questions and thus could be included in the

results of this study (response rate: ~10 %). Most of these organizations were organized as associations (53 %) or private limited companies (29 %). Main fields of activities included social services (60 %), education (34 %) and healthcare (26 %). The NPO included in the sample were primarily financed by public authorities or private beneficiaries. Given these characteristics, it did not surprise to find that the majority of NPO did consider themselves as service providers, whilst the other typical functions of lobbying and community building played a far less important role. Consequently, these specifics of the organizations included have to be considered carefully when interpreting the following results of the studies.

Analysis has been conducted both in MS Excel and SPSS. In the case of most questions, answers were given from 1 (lowest level of agreement) to 5 (highest level of agreement), thus following likert scale logic. Due to non-sufficiently significant findings based on regression analysis, further analysis was performed based on the Wilcoxon-Mann-Whitney U-Test. This causal analysis focused on the question in what respects do the answers by NPO that already employ incentive systems differ from those that do not (yet)? For that purpose, the 58 NPO that are part of the sample were categorized as follows:

- NPO that do not employ any type of institutionalized incentive system (“KA”): N = 42.
- NPO that do employ institutionalized incentive systems (“AA”): N = 16.
- Subgroup of “AA”: NPO that employ institutionalized incentive systems based on a pay-for-performance basis (“AG”): N = 13.

The defined levels of significance were set so that weak significance: $p = 0.10$ (*); significance: $p = 0.05$ (**); high significance: $p = 0.02$ (***). Concerning the presentation of the results achieved, the mean values for each of the three subgroups as well as the corresponding levels of significance are stated in the course of the analysis (order: KA / AA / AG).

The following chapters of this paper just briefly illustrate selected findings from this study. The results of the entire study are documented by Horak et al. (2014).

General findings on performance management and the inferred design of incentive systems in NPO (descriptive analysis)

As one important starting point, the following question was asked: Of what relevance are the following types of aims in order to measure the performance of your organization? Previous studies already revealed a high importance of financial aims for NPOs (e.g. Greiling 2009); this was also illustrated by the findings of this study. The most probable explanation for this is that cost coverage serves as a prerequisite for reaching more relevant aims in a NPO’s organizational target system and is thus of dominating importance. Impact/Outcome-related aims that seem to be more in line with the specific requirements of nonprofit management and management control systems closely follow, but considering their relevance, this also might illustrate a certain degree of ambiguity and possibly tension in the typical target system of NPO.

THE USE AND DESIGN OF INCENTIVE SYSTEMS IN NONPROFIT ORGANIZATIONS AND THEIR RELATION TO NONPROFIT MANAGEMENT CONTROL SYSTEMS – EVIDENCE FROM AUSTRIA

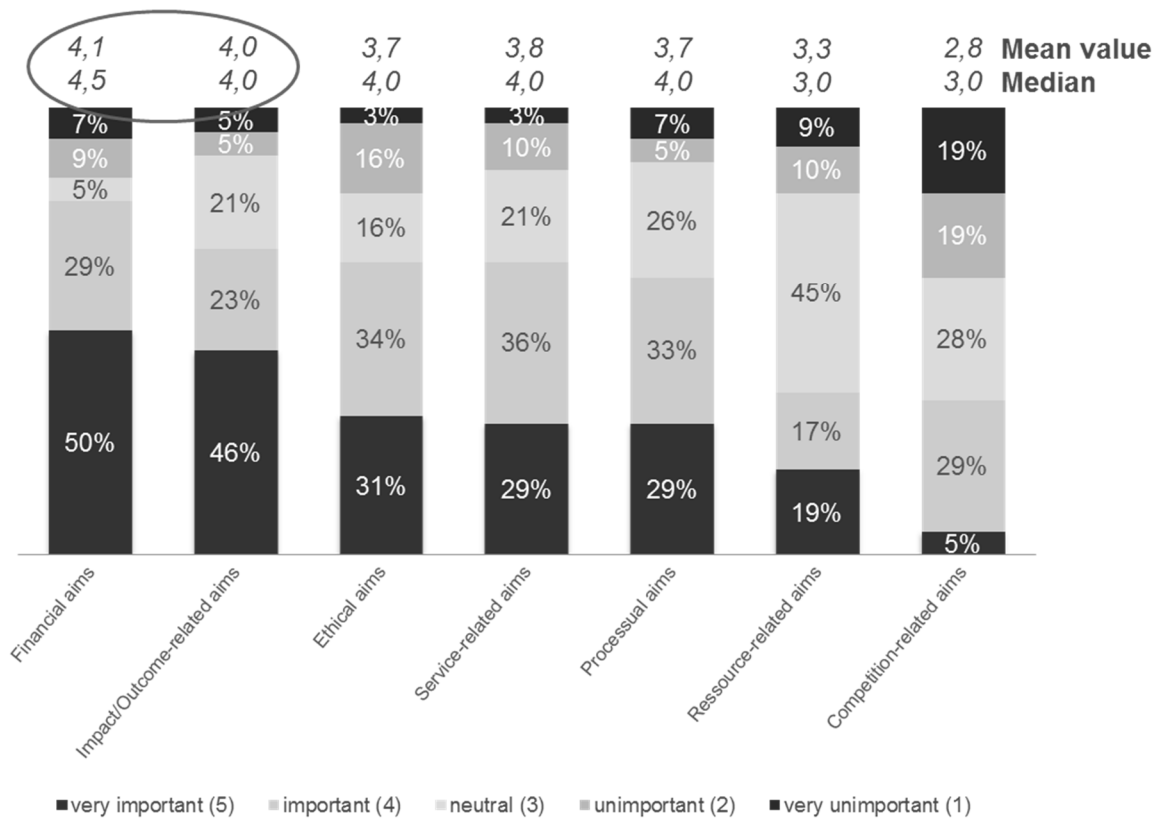


Figure 1: Aims followed by NPO

In line with these findings, the relevant stakeholder groups for determine a NPO's success comprise also two major groups: public funders on the one hand, clients and the general public on the other hand. They represent both those who receive the goods and services of NPO and in most cases are (traditionally) the major funders. Thus, the findings can be seen as a further illustration that this dependence on these especially influential stakeholder groups is also reflected in a NPO's target system. However, tensions might arise given the fact that in many cases, these stakeholder groups may have different interests and thus demand different actions by their NPO.

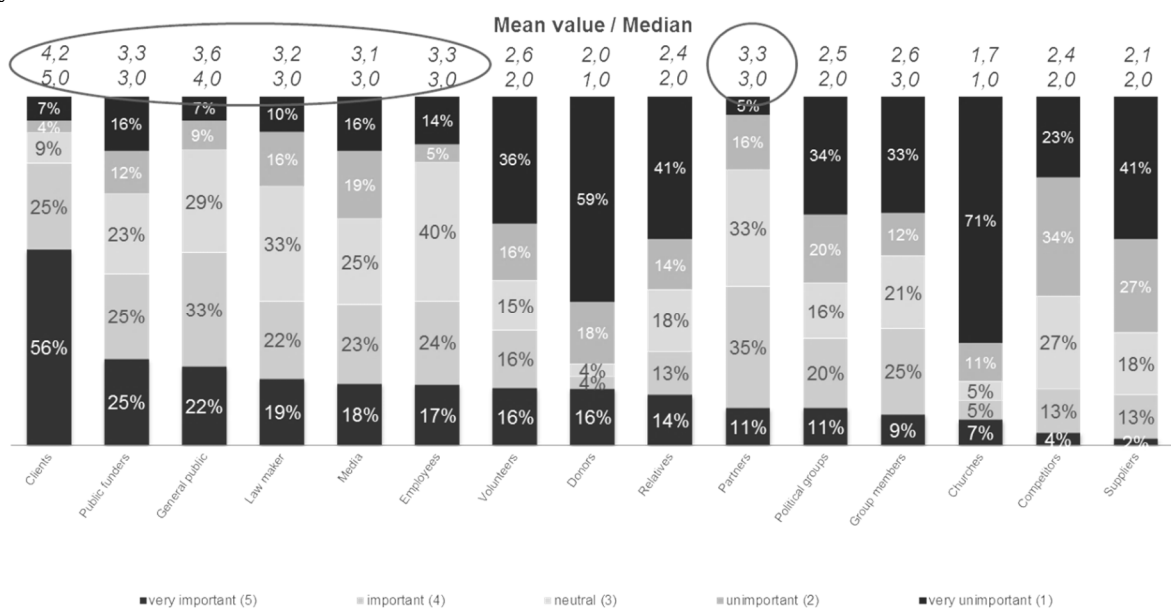


Figure 2: Stakeholder groups that determine an NPO's overall success

Of special relevance for the question of incentive systems was the question on which measurement base is considered relevant for assessing success of employees on an individual level? The findings suggest a dominance of conventional measures such as work output, conduct at work or budgetary aims. The specific dimensions of a NPO's target system are hardly included, which raises questions of considerable importance. Unless the measurement of success is (as far as possible) in line at the organizational as well as the individual level, wrong incentives might be in place for employees to act not in the best interest of the entire NPO.

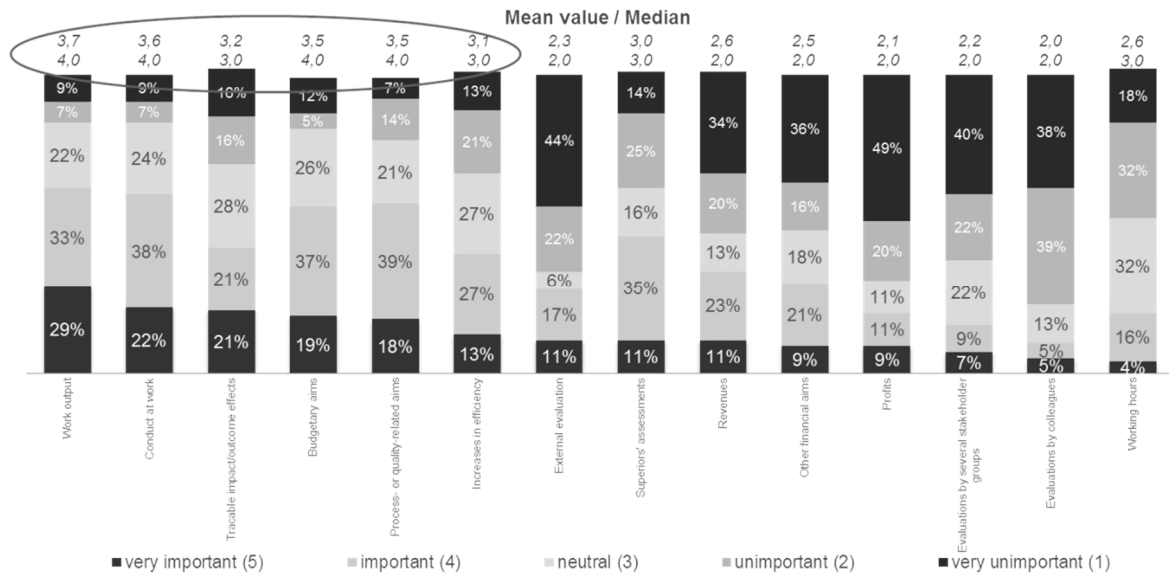


Figure 3: Measurement bases for assessing the success of employees on an individual level

Finally, the use and design of employed incentive systems within the NPO was analyzed. 28 % of organizations included in the sample stated that they employed such an incentive system. Given the general skepticism with regard to them in literature, this seemingly high figure surprises – especially considering the fact that most of these NPO also included monetary rewards as incentives. Non-financial incentives are widespread – but also very heterogeneous; most importantly, praises e.g. by superiors or measures such as promotions are of practical relevance. So, they seem more likely to accompany financial incentives instead of working as substitutes for them.

THE USE AND DESIGN OF INCENTIVE SYSTEMS IN NONPROFIT ORGANIZATIONS AND THEIR RELATION TO NONPROFIT MANAGEMENT CONTROL SYSTEMS – EVIDENCE FROM AUSTRIA

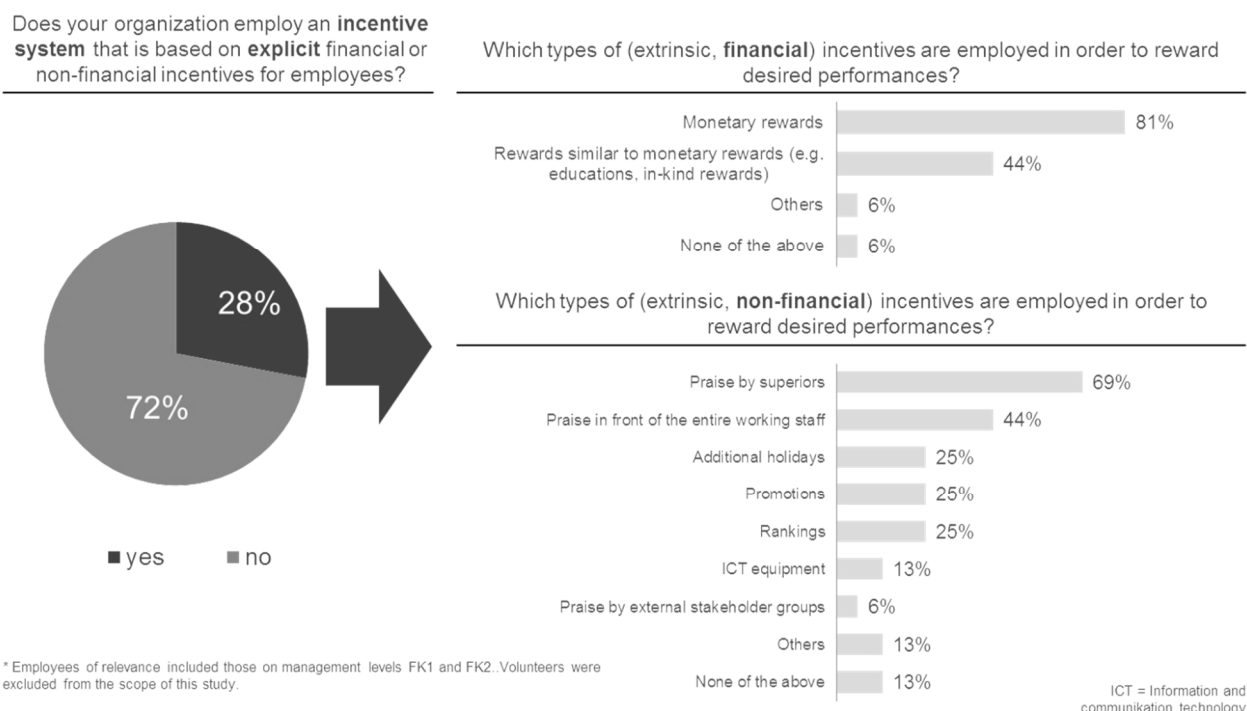


Figure 4: Use of explicit (financial or non-financial) incentive systems in NPOs

Determinants and implications of the use of incentive systems (causal analysis)

As described, causal analysis was undertaken in order to find out further specifics on those organizations that already employ incentive systems and to derive possible implications. Based on the descriptive findings, both determinants and consequences of the use of the various types of incentive systems were analyzed.

Public funds are of less importance for those NPO that employ incentive systems. As this seems to be the environmental factor impacting incentive systems by far the most, the fear that public authorities might not accept the use of such systems and furthermore maybe (financially) penalize NPO seems to be a major concern in the nonprofit-sector: The high relevance of funding for the use and design of incentive systems by NPO has already been stressed by previous literature (Brandl & Güttel 2007).

- Share of income from public funds (subsidies, fees) in relation to total income: 54.5 % / 29.4 % ** / 25.5 % **
- Relevance of the stakeholder group public funders in order to determine an NPO's overall success: 3.43 / 2.93 / 2.50 **
- Relevance of the stakeholder group law makers in order to determine an NPO's overall success: 3.40 / 2.81 / 2.62 **

Those NPOs put less trust into the degree of intrinsic motivation of their employees: 2.90 / 2.50 / 2.31 *. Furthermore, they tend to show organizational cultures that are more expansive and competitive; this is illustrated by the following findings:

- Relevance of strategies aiming at growth: 2.93 / 3.31 / 3.54 *
- Relevance of competition for the organizations' cultures: 2.79 / 3.31 / 3.46 *
- Relevance of community/solidarity for the organizations' cultures: 3.83 / 3.19 * / 3.38

Those NPOs employ more developed management control systems within their organizations: 3.40 / 3.75 / 4.08 *. This might directly be linked to the practical implications derived from the following finding: The choice of the relevant measurement bases for assessing success of employees on an individual level is more sophisticated and considers process- and quality-related aims as well as impact/outcome-related aims (in accordance with the dominating aims on an organizational level):

- Process- and quality-related aims: 3.29 / 3.93 ** / 4.08 **
- Impact/Outcome-related aims: 2.86 / 3.94 *** / 4.08 ***

This, of course, required further developed management control systems that generate and consequently use this information. However: also revenues seem to be of far more importance as a measurement base in those organizations that employ incentive systems: 2.37 / 3.13 / 3.33 *. This is somehow in conflict with the findings given before and comes rather unexpected in a nonprofit-context; however, it might be explained e.g. by the specifics of a fundraising environment as revenues in the sense of raised funds for the NPO are both traceable and relevant information in the context of such organizations. Still, this study's findings remain ambiguous in that respect.

The main chances are seen in respect to the use of resources within the organization; the following findings also underline the relevance of incentive systems for management control systems, as those in general tend to follow very similar goals:

- Increased effectiveness of resources used: 3.10 / 4.00 *** / 4.18 ***
- Increased efficiency for managing the organization: 3.05 / 4.13 *** / 4.25 ***
- Concrete statement of the organization's aims and alignment of all actions with these aims: 3.05 / 3.93 *** / 4.00 **

Obstacles to the employment of financial incentives that are typically discussed in literature are considered less relevant:

- Threat of crowding-out effects: 3.43 / 2.56 ** / 2.62 *
- Threat of conveying an adverse image towards stakeholder groups : 3.27 / 2.31 ** / 2.00 ***
- Threat of lack of acceptance by (esp. public) funders: 3.34 / 2.13 *** / 1.62 ***
- Threat of causing turmoil amongst the working staff: 3.45 / 2.63 ** / 2.54 **

The use of financial incentives as part of incentive systems is considered (highly) more appropriate and useful by those NPO that do employ them: 2.79 / 3.79 *** / 3.91 ***. This might be interpreted either as some type of self-confirmation bias or – more positively – as a possible hint at the fact that NPO that have already gained practical experiences with the use of such incentive systems are satisfied with the achieved results. In the latter case, this might be a

very important information for NPO still being unsure about employing or reluctant to employ financial incentives as part of their incentive systems. Furthermore, with regard to the employment of non-financial incentives, there are no distinctions between the three groups (exception: threat of conveying an adverse image towards stakeholder groups: 2.26 / 1.63 * / 1.54 *).

Finally – although less distinct – the signaling-effect with regard to professionalization of the organization's structures seems relevant: 2.70 / 3.27 / 3.42 *. However, this seems to play only a very limited role for the NPO included in the sample and thus comes as a surprise given the high relevance that is attributed to this effect in literature (Theuvsen 2004).

Final findings and conclusion

Managers in NPOs show a high degree of ambivalence with regard to incentive systems for their organizations. Non-financial incentives are considered most appropriate; implicit as well as intrinsic incentives seem preferable, however are difficult to implement within organizations. These findings are in line with prior studies that stress these specifics of incentive systems in the context of NPO. For managers aiming at implementing such systems, this poses specific challenges for which only very little help can be obtained from literature so far.

Main obstacles for implementing incentive systems are seen in the context of financial incentives. They include: crowding-out-effect or possible conflicts within organizations. This seems also in line with the perceptions stated so far in literature. However: In the context of non-financial incentives, these obstacles are considered less relevant. Chances with regard to incentive systems include increased motivation by employees and a more effective as well as efficient use of resources endowed to organizations. Again, it has to be stressed that chances receive more favorable ratings than corresponding obstacles. Also, the threat of the crowding-out effect seems somewhat less feared from a practical perspective than its discussion in literature would suggest. This is an aspect that clearly deserves further attention and research.

Incentive systems are a relevant instrument not only with regard to top management, but might also prove helpful in the context of non-managers. However, in that case specific adaptations seem to be necessary. Distinct features of these incentive systems are arguably the desire to express appreciation for the organization's working staff or increasing low minimum wages in certain fields of activities.

NPO obviously tend to develop individual incentive systems within their organizations. Hardly ever incentive systems from other organizations seem to be taken as templates in that process (either forprofit or nonprofit).

Practical experience seems to support the benefits of incentive systems in an NPO-context. Incentive Systems might play a role in the context of management control systems by posing specific requirements, but also promoting an alignment between the organization's aims and its employees' acting. Especially in the context of impact/outcome-related aims, this might be of considerable importance.

Public funders seem to play the most important role as obstacles to the further promotion of incentive systems in NPO. However, their importance is expected to (further) decrease over the next years. This might imply further relevance of the use of incentive systems in NPO. Furthermore, this also implies relevance of research on that field in the future to gain deeper understanding on the mechanisms and results of such incentive systems and to gain an understanding for the way these are changing over time.

References

- Brandl, Julia / Güttel, Wolfgang (2007): Organizational Antecedents of Pay-for-Performance Systems in Nonprofit Organizations. In: *Voluntas*, 18 (2), 176–199.
- Greiling, Dorothea (2009): Erfolgsmaßstäbe für Nonprofit-Organisationen. In: *Betriebswirtschaftliche Forschung und Praxis*, 61 (1), 56–78.
- Helmig, Bernd / Boenigk, Silke (2012): *Nonprofit Management*. München.
- Horak, Christian / Baumüller, Josef (2013): Controlling und Rechnungswesen in NPOs. In: Simsa, Ruth / Meyer, Michael / Badelt, Christoph (eds.): *Handbuch der Nonprofit-Organisation*, 313–334. 5th edition, Stuttgart.
- Horak, Christian / Baumüller, Josef / Bodenstorfer, Martin (2014): Anreizsysteme für Leitungsorgane in Nonprofit Organisationen. Einsatz, Ausgestaltung und Perspektiven, http://www.controller-institut.at/uploads/content/tx_downloads/file/NPO-Studie_2014.pdf. 20.11.2015.
- Jacobi, Jens (2013): Erfolgsbasierte Vergütung in Schweizer Verbänden und anderen NPO. In: Gmür, Markus / Schauer, Reinbert / Theuvsen, Ludwig (eds.): *Performance Management in Nonprofit-Organisationen*. Bern, 160–169.
- Krönes, Gerhard V. (2008): Arbeitsentgelt in NPO aus motivationaler Sicht. In: *Verbands-Management*, 34 (2), 6–21.
- Schober, Doris / Schmidt, Andrea / Simsa, Ruth (2013): Personalmanagement. In: Simsa, Ruth / Meyer, Michael / Badelt, Christoph (eds.): *Handbuch der Nonprofit-Organisation*, 247–265. 5th edition, Stuttgart.
- Speckbacher, Gerhard (2008): Nonprofit versus corporate governance: An economic approach. In: *Nonprofit Management and Leadership*, 18 (3), 295–320.
- Speckbacher, Gerhard (2013): The Use of Incentives in Nonprofit Organizations. In: *Nonprofit and Voluntary Sector Quarterly*, 42 (5), 1006–1025.
- Theuvsen, Ludwig (2004): Doing Better While Doing Good: Motivational Aspects of Pay-for-Performance Effectiveness in Nonprofit Organizations. In: *Voluntas*, 15 (2), 117–136.

CAPITAL STRUCTURE AND FIRM PERFORMANCE: DOES CREDIT RISK MAKE A DIFFERENCE?

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Abstract: *This study investigates the relationship between capital structure and firm performance, using a cross-sectional sample of the European firms from Austria, Belgium, Netherlands, Portugal, Spain, the UK, Finland, Sweden, France, Italy and Germany in 2012. We test empirically whether a firm's credit risk will affect the relationship between capital structure and firm performance. This study extends the findings of previous studies, which concentrate only on the unitary relationship between capital structure and firm performance, by introducing a third factor, credit risk, into this relationship. Our results show that in low credit risk firms, financial leverage is negatively related to firm performance; while, in high credit risk firms, financial leverage is positively associated with firm performance. These results imply that credit risk is a very important factor that influences the positive or negative relationship between capital structure and firm performance. Therefore, understanding of a firm's credit risk can assist its financial manager making suitable financial decisions to maximize firm performance.*

JEL classification: G32, G33, M41, N24

Keywords: *Credit risk, bankruptcy, financial leverage, agency cost, firm performance*

Introduction

Capital structure refers to the mixture of different types of funding sources, which a firm maintains resulting from its capital structure decisions (Niu 2008). Capital structure has been one of the most widely researched areas in the corporate finance literature since the late 1950s. However, there is an ongoing debate in the literature on whether higher leverage will enhance firm performance (or firm value) or reduce firm performance. So far, results remain mixed.

The idea stating that capital structure is irrelevant to firm value in perfect market situation was proposed by Modigliani and Miller (Modigliani and Miller 1958), which is often referred to MM theory nowadays. This research was considered as the starting point of modern theory of capital structure (Myers, 1984). However MM theory is based on certain

assumptions that does not hold in reality, consequently, a number of financial economists were encouraged to further investigate the relationship between capital structure and firm value outside the context of a perfect market. Two important capital structure theories are the trade-off theory and the pecking order theory. By relaxing tax assumptions, Kraus and Litzenberger first proposed the trade-off theory, which suggests that the firm determines its capital structure via its balance between the tax shield benefits and bankruptcy costs related to debt financing (Kraus and Litzenberger 1973). Trade-off theory suggested more levered firms would generate more profitability, due to the more tax savings they make. The pecking order theory is an alternative theory to capital structure. According to this theory, the firm prefers to use internal financing via retained earnings at first; the firm's second preference is debt, followed by equity, the last choice among options for financing sources (Myers and Majluf 1984). In some extent, the pecking order theory is opposite to the trade-off theory. Because of the ability to generate more adequate internal funding to finance themselves, firms with lower target debt ratio are usually the more profitable ones rather than less profitable firms.

The debate between the trade-off theory and the pecking order theory leads to opposing views on the association between capital structure and firm performance. Results in the empirical literature remain equally mixed. Some researchers have indicated that there is a positive relationship between financial leverage and firm performance (Ang et al. 2000; Berger and Bonaccorsi di Patti 2006; Ghosh et al. 2000; Grossman and Hart 1982; Hadlock and James 2002; Holz 2002; Jensen 1986; Margaritis and Psillaki 2010; Dessí and Robertson 2003; Wipperfurth 1966; Williams 1987), while others find that financial leverage is negatively related to firm performance (Abor 2005; Gleason et al. 2000; Ghosh 2007; Jensen and Meckling 1979; Krishnan and Moyer 1997; King and Santor 2008; Majumdar and Chhibber 1999; Soumadi and Hayajneh 2012; Onalapo and Kajola 2010; Rao et al. 2007; Simerly and Li 2000).

According to previous studies, the relationship between capital structure and firm performance is considered to be contradictory and inconsistent. Based on this it is possible to conclude, that there may exist some additional factor which induces the contradictory findings. However, few studies have concentrated on investigating the relationship between capital structure and performance by introducing a third factor. This study attempts to fill this void by introducing firm credit risk as a possible factor behind the contradictory relationship between capital structure and firm performance.

We test this relationship empirically by using a cross-sectional sample of European firms in Austria, Belgium, Netherlands, Portugal, Spain, the UK, Finland, Sweden, France, Italy and Germany in 2012.

Our results indicate that the relationship between financial leverage and performance is not consistent. Instead, it is driven by the firm's credit-risk status. Generally speaking, the main conclusion of the results is that in low credit risk firms, financial leverage is negatively related to performance and that in high credit risk firms, financial leverage is positively associated with performance.

The remainder of this paper is structured as follows. Section two of the study discusses the relevant literature and the general hypothesis. Section three describes the use of variables

and the empirical model applied in this analysis. Section four presents the data and descriptive statistics on the variables. Section five presents the main empirical results. Section six concludes the study.

Literature Review and Hypotheses Development

Capital structure first attracted the attention of academic researchers in corporate finance when Modigliani and Miller (Modigliani and Miller 1958) proposed their pioneer “MM” theory stating that capital structure is irrelevant to a firm’s value. The MM theory proposes that there is no relationship between a firm’s financing mix and its value in a perfect market situation. Because perfect markets do not exist in reality, the MM theory does not hold, and capital structure influences firm value in a non-perfect market. Two important capital structure theories that have since emerged are the trade-off theory and the pecking order theory.

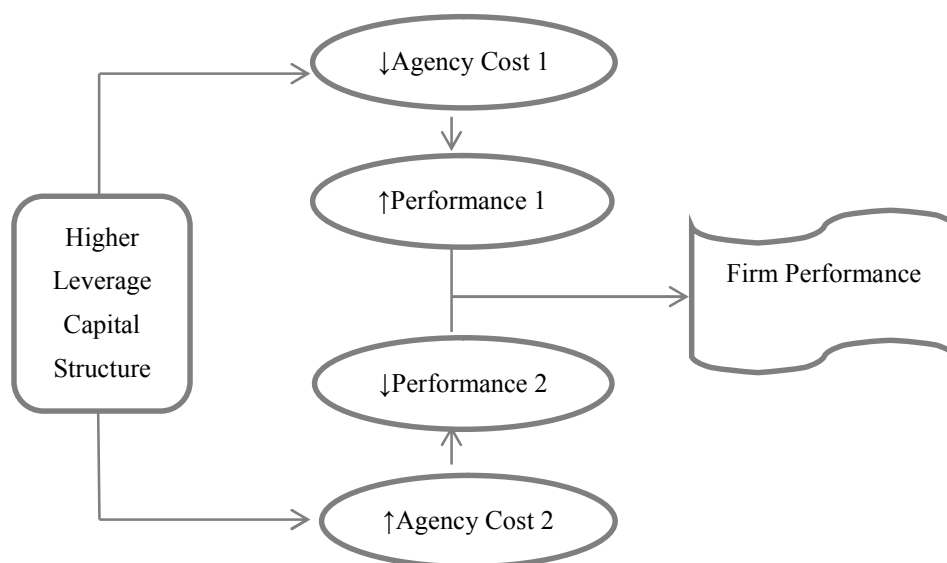
Kraus and Litzenberger (Kraus and Litzenberger 1973) first proposed the trade-off theory, which suggests that the firm determines its capital structure via its balance between the benefits and costs related to debt financing, e.g., by balancing the trade-off between tax sheltering and bankruptcy costs (Myers and Majluf 1984). According to the trade-off theory, the more levered the firm is, the more tax savings it should make and the higher performance it will attain. This implies that higher leverage promotes firm performance. However, unlike the trade-off theory, the pecking order theory argues that a firm should assign an order to their financing sources: According to this theory, the firm prefers to use internal financing via retained earnings at first; the firm’s second preference is debt, followed by equity, the last choice among options for financing sources (Myers and Majluf 1984). Thereby, a more profitable firm would maintain lower financial leverage due to its choice of retained earnings as the first financing source, because a higher leverage could bring more financial risk and payment burden to obstruct potential performance and development capability. Therefore, from the pecking order theory view, higher leverage has a negative effect on firm performance.

If the theories on the effect that financial leverage has on capital structure are mixed, so are the empirical results. Many studies suggest that there is a positive relationship between capital structure measured by leverage and firm performance. Wipperfurth investigated the possible association between financial leverages and firm values in some industries (Wipperfurth 1966). The results suggest that a firm’s financial leverage is positively associated with its value, which is to say that outside debt financing could increase the firm’s performance and, consequently, its wealth. In the following years, Grossman and Hart showed that a firm’s managerial cash-flow waste could be decreased by using a higher level of financial leverage as a disciplinary tool (Grossman and Hart 1982); therefore, more efficient performance could result. Consistent with Grossman and Hart’s findings, Jensen (Jensen 1986) suggest that inefficiency can be avoided by having a higher level of leverage, because the higher leverage transfers the greater pressure to the firms, so they must then enhance their performance in

order to generate more cash flow to service debt. In recent years, Margaritis and Psillaki suggest that banks do not want to offer loans to firms until they can accurately monitor the firms' projects and, with certainty, predict that the firms can achieve profits sufficient to meet their obligations (Margaritis and Psillaki 2010). The more loans the firms want to receive from a bank, the higher performance they should demonstrate so that the bank can be sure that the firm's earning capability will be enough to meet its loan obligations. The positive relation between financial leverage and firm performance can also be found in, e.g., (Ang et al. 2000; Berger and Udell 2006; Williams 1987; Ghosh et al. 2000; Hadlock and James 2002; Holz 2002; Dessi and Robertson 2003).

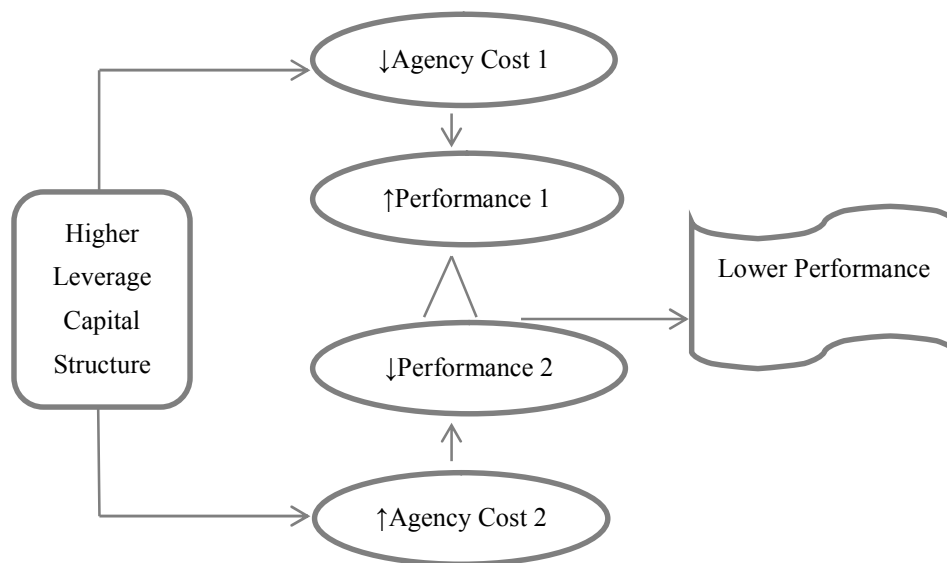
In contrast, other empirical studies find that capital structure measured by financial leverage is negatively related to firm performance (see, e.g., Krishnan and Moyer 1997). The more debt the firm receives, the more interest it is likely to pay, resulting in less cash available; therefore, the greater the possibility that the high-growth project will be unprofitable. By using different types of capital structure measures in his study, Abor (2005) demonstrates that capital structure may have a significantly negative effect on firm performance. Moreover, It is found that higher leverage usually results in higher interest rates and a need for more collateral, which may reduce the firm's performance by the mitigation of cash flow and the lack of sufficient assets/resources (Soumadi and Hayajneh 2012). The negative relationship between leverage and firm performance has also been observed in, e.g., (Majumdar and Chhibber 1999; Gleason et al. 2000; Simerly and Li 2000; Abor 2005; Ghosh 2007; Rao et al. 2007; King and Santor 2008; Onaolapo and Kajola 2010).

It seems that the relationship between capital structure and firm performance is contradictory and inconsistent in both theoretical and empirical studies. It is however possible that there is some other factor that induces the contradictory relations. However, few studies have concentrated on investigating the relation between capital structure and performance by introducing a third factor which could induce the mixed results. In previous studies, agency theory suggests that firm level credit-risk could be a factor which can be used to explain why the results vary.



Graph 2.1

According to agency theory, agency costs would rise because of the different conflicts of interest between the firm's owners and managers when there is a separation between ownership and management. Jensen and Meckling (Jensen and Meckling 1979) propose two types of agency conflicts. One is the agency conflict between managers and the shareholders due to the separation of ownership and control (Agency Cost 1). The other is the agency conflict between the debt holders and the equity holders, which can be raised by increasing outside debt financing (Agency Cost 2). Although Ang et al. (Ang et al. 2000) point out that higher leverage may mitigate agency conflict between shareholders and managers (Agency Cost 1) because debt holders will be monitoring the firm more closely, Niu suggests that one way to minimize the agency cost between debt holders and equity holders (Agency Cost 2) is to make a capital-structure decision to decrease the leverage level (Niu 2008). Therefore, it can be argued that higher leverage can reduce Agency Cost 1 and increase Agency Cost 2 at the same time (see Graph 2.1). Considering this, whether higher leverage will enhance firm performance or reduce it will depend both on to what extent performance increases through a decrease in Agency Cost 1 and to what extent performance decreases through an increases in Agency Cost 2.

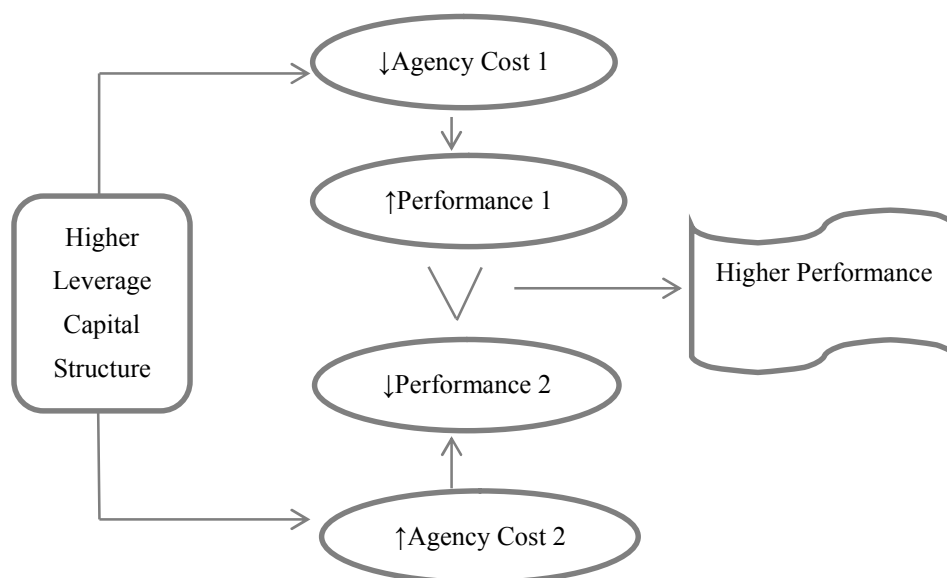


Graph 2.2

Because low credit risk firms usually have higher transparency, more mature operating and controlling mechanisms, and a higher capability for generating more earnings, the influence of monitoring these firms' with higher leverage is not strong. In contrast, the influence of a reduction in the available cash flow and fewer available assets/resources due to the firm's higher leverage is crucial. Therefore, when low risk firms highly levered, the increasing extent of Performance 1 influenced by monitoring, guiding, and restricting is lower than the decreasing extent of Performance 2 influenced by a reduction in available cash flow and fewer available assets/resources. That is, the strength of Performance 1, increased due to a reduction in Agency Cost 1, is weaker than the strength of Performance 2, which is decreased due to Agency Cost 2 being induced. (see Graph 2.2). In this manner, higher leverage has the

blocking effect on firm performance in low risk firms. Based on this discussion, we hypothesize that:

H1: Financial leverage is negatively related to firm performance in low credit risk firms.



Graph 2.3

High risk firms on the other hand, are commonly facing more managerial fraud problems, worse operating and controlling systems, and a weaker capability to generate earnings. As a result, the influence of monitoring, guiding, and restricting due to the firm's higher leverage may be important. Conversely, the influence of a reduction in available cash flow and fewer available assets/resources due to the firm's higher leverage may be of less importance. Therefore, when high risk firms have higher leverage, the increase in performance 1, influenced by monitoring, guiding, and restricting, is stronger than the decrease in performance 2, influenced by a reduction in available cash flow and fewer available assets/resources. That is, the strength of Performance 1, increased due to a reduction in Agency Cost 1, is greater than the strength of Performance 2, which is decreased due to Agency Cost 2 being induced (see Graph 2.3). From this point of view, higher leverage promotes firm performance in high risk firms. Based on this, we hypothesize that:

H2: Financial leverage is positively related to firm performance in high credit risk firms.

Methodology

Dependent Variables

Table 1 presents the variables which were used in the analysis. We measure firm performance by the return on assets (ROA), the ratio of the firm's net income to its total assets. Many researchers have measured firm performance by using ROA as a proxy (Braam and Nijssen

2004; Ittner and Larcker 1997; Crabtree and DeBusk 2008; Cheng et al. 2012). In order to avoid the potential measurement error of ROA and results' sensitivity to OLS parametric assumption, for additional regression analysis, we created a firm performance indicator, which is equal to 1 if ROA is more and equal to the mean of ROA (2.460) (0 otherwise). We also use an alternative firm performance variable in our study: ROCE, which indicates the percentage of the sum of net income and interest paid to the sum of the firm's equity and long-term liability. Nirajini and Priya (2013) studied the capital structure and corporate performance with ROCE as the performance variable. Uadiale (2010) also measured corporate performance by using ROCE in his research.

We measure capital structure by financial leverage. There are two financial leverage expressions: LEV_ASST is the ratio of total liability to total assets (Michaelas et al. 1999; Ghosh 2007; Stankevičienė and Norvaišienė 2007; King and Santor 2008; Weill 2008; Westgaard et al. 2008; Morri and Cristanziani 2009; Margaritis and Psillaki 2010; Rovolis and Feidakis 2014). The alternative financial leverage expression is LEV_EQIT, which is the ratio of total liability to equity instead (Majumdar and Chhibber 1999).

Credit Variables and Control Variables

The proxy for the firm's credit risk variable is CREDIT_RISK, which is an indicator variable equal to 1 in case of the firm is in a high credit risk status (0 otherwise). In this study, we considered the firm to have high credit risk if the firm is in any of the following statuses: payment default, insolvency proceedings, bankruptcy, and/or dissolution due to bankruptcy. Absent any of these, the firm is considered to be a low credit risk firm.

In the analysis, we also include a set of control variables that can affect firm performance. The TANGIBLE variable is the ratio of fixed assets to total assets (Rajan and Zingales 1995; Michaelas et al. 1999; Filbeck and Gorman 2000; Bontempi 2002; Bevan and Danbolt 2004; Feidakis and Rovolis 2007; Weill 2008; Margaritis and Psillaki 2010). Margaritis and Psillaki point out that a firm's tangibility might help improve its performance (Margaritis and Psillaki 2010). However, Konijn et al. argue that the influence of tangibility on firm performance is ambiguous (Konijn et al. 2011). Dunne et al. find that firm age plays an important role on its growth and performance (Dunne et al. 1989). For purposes of our study, AGE is defined as the natural logarithm of 1 plus years since a firm's start. Firm age and size are the two most commonly investigated independent variables suggested to affect firm growth and performance (Lappalainen and Niskanen 2012). Therefore, we also use SIZE as an additional control variable: the natural logarithm of a firm's total assets (Qureshi and Azid 2006; Stankevičienė and Norvaišienė 2007; King and Santor 2008; Morri and Cristanziani 2009; Onalapo and Kajola 2010; Dang 2011). Previous studies also suggest that legal form may have an effect on a firm performance and that private firms operate more profitably than public firms (Degeorge and Zeckhauser 1993; Jain and Kini 1994; Mikkelsen et al. 1997; Pagano and Panetta 1998). In our study, we defined a firm's legal form as PUBLIC, which is an indicator variable equal to 1 in the case of a public firm and equal to 0 in the case of a private firm. We included two innovation variables: PATENTS and TRADEMARKS.

PATENTS is an indicator variable equal to 1 in the case of a firm having patents (0 otherwise). TRADEMARKS is an indicator variable equal to 1 in the case of a firm having trademarks (0 otherwise). It is suggested that innovation may have an effect on firm performance (Lööf and Heshmati 2006). Aside from the above control variables, we included GROUP in our study, which is an indicator equal to 1 in the case of a firm belonging to a group (0 otherwise). CURRENT is the percentage of current assets to current liabilities. COUNTRY_TYPE is a country indicator variable, which defines 11 countries using the numbers 1 to 11 (see Table 1).

Referencing Burgstahler et al. (2006), we included three country-specific variables in our study. SYSTEM (capital market structure indicator) is an indicator variable equal to 1 in the case of a market-based financial system and 0 in the case of a bank-based financial system. LEGFOR (the quality of the legal system and enforcement indicator) is an indicator variable equal to 1 in the case of a strong legal system and enforcement (0 otherwise). TAX (tax-book conformity indicator) is an indicator variable equal to 1 in the case of financial accounts for external reporting and tax purposes being highly aligned (0 otherwise).

Empirical Model

To test the hypothesis, the following two regression models were estimated from the full cross-section samples and subsamples.

MODEL 1:

$$ROA_i \text{ (} ROA_01i \text{)} = \mu_0 + \mu_1 LEV_ASST_i + \mu_2 CREDIT_RISK_i + \mu_3 TANGIBLE_i + \mu_4 AGE_i + \mu_5 SIZE_i + \mu_6 PUBLIC_i + \mu_7 PATENTS_i + \mu_8 TRADEMARKS_i + \mu_9 GROUP_i + \mu_{10} CURRENT_i + \mu_{11} SYSTEM_i + \mu_{12} LEGFOR_i + \mu_{13} TAX_i + \mu_{14} COUNTRY_TYPE_i + \varepsilon_i$$

MODEL 2:

$$ROA_i \text{ (} ROA_01i \text{)} = \mu_0 + \mu_1 LEV_ASST_i + \mu_2 CREDIT_RISK_i + \mu_3 CREDIT_RISK_i * LEV_ASST_i + \mu_4 TANGIBLE_i + \mu_5 AGE_i + \mu_6 SIZE_i + \mu_7 PUBLIC_i + \mu_8 PATENTS_i + \mu_9 TRADEMARKS_i + \mu_{10} GROUP_i + \mu_{11} CURRENT_i + \mu_{12} SYSTEM_i + \mu_{13} LEGFOR_i + \mu_{14} TAX_i + \mu_{15} COUNTRY_TYPE_i + \varepsilon_i$$

Data and Descriptive Statistics

Sample Selection

The data selected in this study are a cross-section, from 11 EU countries (Austria, Belgium, Netherland, Portugal, Spain, the UK, Finland, Sweden, France, Italy, and Germany) in the fiscal year 2012. The credit-related data and financial data were collected randomly from the Amadeus Database of Bureau van Dijk, which covers firms' financial and business information throughout Europe. The total sample contains 2,573 firms in Austria, 7,218 firms in Belgium, 2,264 firms in Netherland, 6,937 firms in Portugal, 8,028 firms in Spain, 5,107 firms in the UK, 5,960 firms in Finland, 5,218 firms in Sweden, 3,582 firms in France, 6,543 firms in Italy and 5,396 firms in Germany. All financial firms are excluded from the analysis. The total number of observations is 58,826, among which there are 50,669 low credit risk firms and 8,157 high credit risk firms.

Descriptive Analysis

Table 2 presents descriptive statistics for the variables. The reported statistics show that 13.87 percent of the sample firms are credit risk firms according to the definition. The description statistic results of PATENTS and BOOKMARKS indicate that 14.32 percent of the sample firms had more than 1 patent in the fiscal year 2012, and 17.63% of them received more than 1 bookmark in the year 2012. Among the samples, 65.13 percent of the firms are private firms, and 34.87 percent were public firms. The results imply that 75.18 percent of the total firms belonged to a member of a group. In our study, we included three country-level variables: SYSTEM, LEFOR, and TAX. The results show that, among the samples, 32.39% of them were from bank-based systems and 67.61% were from market-based systems. It was found that 48.18 percent of the samples were in strong legal systems, while the rest (51.82 percent) were in weak legal systems. The financial reports in 87.47% of the samples, for external reporting and tax purposes, were highly aligned. The mean value of ROA is 2.460. LEV_ASST is, on average, 28.074 with a median of 23.986. Descriptive statistics also showed that the mean of TANGIABLE is 0.349, and its median is 0.297. The Maximum of AGE is 6.865; its minimum is 0 with an average 2.988. SIZE is, on average, 9.832 with a maximum of 20.300. Moreover, the mean of CURRENT is 1.942, ranging from 0 to 98.773.

Univariate Tests

Table 3 presents univariate comparisons by credit risk. The results show that the firms experiencing credit risk have lower performance (ROA), and higher leverage. When it comes to control variables, the results indicate that high credit risk firms have higher tangible ratios. In addition, low credit risk firms are consistently older and larger than high credit risk ones. In addition, low credit risk firms are more likely to have a higher current ratio than high credit risk ones.

Univariate Pearson Correlations

Table 4 presents Univariate Pearson correlations. Generally speaking, through the Pearson correlation test, the result shows that the correlation between variables does not indicate problems with multicollinearity in the regression analysis. We observe that the maximum correlations are the correlations between SIZE and CREDIT_RISK (-0.602), and the correlations between SIZE and GROUP (0.497). The other correlations are all below 0.430.

Table 2 presents the average of VIF value in the last column. All of the VIF is under 2.2192. Therefore, overall, serious correlations and multicollinearity do not exist.

Empirical Results

Main Regression Results

Table 5 presents the main regression results in our study. Table 5-A shows the results of OLS regression of model 1 and model 2 with industry controls; Table 5-B shows the results of OLS regression in subsamples divided by CREDITRISK with industry controls; Table 5-C contains the results of logistic regressions of model 1 and model 2 with industry controls.

As expected, the results of Table 5-A indicate that LEV_ASST and CREDIT_RISK take a consistent significant negative sign in both model 1 and model 2, but the interaction term CREDIT_RISK* LEV_ASST takes a significant positive coefficient in model 2. These results suggest that firms with higher financial leverage experience lower firm performance in the full; high risk firms exhibit lower firm performance, but the relationship between financial leverage and firm performance is positive for high credit risk firms. These results confirm the hypothesis 1 and hypothesis 2.

The results of Table 5-B show that although LEV_ASST is significantly negative for the full sample, the relationship is not consistent in the subsamples. Column 2 and column 3 show the regression results for the high risk sample and the low risk sample separately. We find that LEV_ASST takes a significant positive sign in column 2 and a significant negative sign in column 3, which indicates that higher leverage increases firm performance in high risk firms, while higher leverage reduce firm performance in low risk firms.

In order to check whether the above results are sensitive to the parameter assumptions of linear regression, we created an indicator variable for firm performance measurement, which is ROA_01 equal to 1 if ROA is more and equal to the mean of ROA (2.460) (0 otherwise). Column 1 of Table 5-C presents the logistic regression results of model 1 and column 2 the logistic regression of model 2. The results are consistent with the results observed in Table 5-A. LEV_ASST and CREDIT_RISK take a statistically significant negative sign in both model 1 and model 2, but the interaction term CREDIT_RISK* LEV_ASST take a significant positive coefficient in model 2.

For control variables, TANGIBLE takes a negative sign and CURRENT takes a positive sign in all regressions of Table 5, which suggests that maintaining a lower fixed assets ratio and a higher current ratio can lead to higher firm performance. The results suggests current assets are more important for firms to increase firm performance. Managers should consider to allocate enough proportion of current assets in assets structure when increasing performance. The results also shows firms with more capability to meet short-term obligation have higher firm performance, In addition, LEGFOR is found to have a significant positive result in all the main regressions, which indicates that firms operating in stronger and more powerful legal systems are more likely to have higher performance. The explanation of the results is that firms in weaker legal enforcement countries have lower firm performance due to more possibility to abuse discretion afforded by accounting rules. SYSTEM is significantly positive in the low risk subsample regressions, but it is significantly negative in most of the remaining regressions in Table 5. The results suggest that normally firms in bank-based systems are more likely to experience better performances than those in market-based systems; however, if all firms are low risk firms, market-based systems are more likely to promote firm performance. It indicates that governance provided by investors or takeovers from market-based systems plays a better role in promoting firm performance for the firms who have a good credit, Moreover, TAX is significantly negative with firm performance in

Table 5-A and Table 5-C, which can be interpreted to mean that firms in highly tax aligned financial environments are more likely to have lower performance.

We also ran all the regressions again with both industry dummies and country dummies after deleting country-specific variables: SYSTEM, LEGFOR and TAX; the unreported results are quite similar to the ones above. We also ran all the regressions with the alternative firm performance variable (ROCE) and the alternative capital structure variable (LEV_EQIT), the results of which are strongly consistent with the ones reported above.

Sensitivity Analysis

Table 6 presents the results for additional sensitivity analysis. Columns 1 to 4 are the results of sensitivity analysis to age; columns 5 to 8 are the results of sensitivity analysis to size; columns 1 to 4 are the results of sensitivity analysis to the firms' legal form. Generally speaking, the sensitivity analysis result determined that it does not make a difference whether the firms are larger or smaller, older or younger, public or private: The interaction terms all take significantly positive signs, while LEV_ASST and CREDIT_RISK all took consistently significantly negative signs. This suggests that all results are robust for firm age, size and legal form.

Conclusions

Previous studies on capital structure and firm performance indicate that the relationship between capital structure and firm performance remains a puzzle. Some researchers have indicated that there is a positive relationship between capital structure measured by financial leverage and firm performance, while others find that financial leverage is negatively related to firm performance. Our study introduced a third factor, i.e., credit risk, which could drive the relationship between capital structure and firm performance.

The purpose of this study is to analyze the association between capital structure and firm performance with respect to credit risk in 11 European countries (Austria, Belgium, Netherland, Portugal, Spain, the UK, Finland, Sweden, France, Italy, and Germany). The aim is to empirically test whether a firm's credit risk will affect the relationship between capital structure and firm performance. Our results show that the relationship between financial leverage and performance is not consistent. Instead, it is driven by the firm's credit-risk status. Our main finding is that in low credit risk firms, financial leverage is negatively related to performance; while, in high credit risk firms, financial leverage is positively associated with performance.

This study extends the findings of previous studies, which concentrated only on the unitary relationship between capital structure and firm performance, by introducing a third factor (credit risk) into this relationship. The policy implication that emerges from the results is that, firm managers should realize that credit risk could be an important factor when formulating and executing a good capital structure strategy. For example, for low credit risk firms, lower financial leverage is connected with an increase in firm performance. In order to improve performance, managers in low credit risk firms should consider keeping less financial leverage. For high credit risk firms, however, the results imply that too little financial leverage will impede the firm's performance so that it may discourage the firm's development. In addition, the results have practical implications, such as for banks or other financial institutions, for which knowing that credit risk could affect the relationship between capital structure and firm performance can help make better lending decisions and forecast clients' future performance. Due to the data limitation, this study performed analyses on only 11 European countries. Future study is needed to enlarge the data samples by selecting samples

from other EU countries or even from outside EU countries. In addition, our results are based on the analysis of cross-sectional data collected in 2012. Possible cross-sectional data from other years or panel data could be used in future studies.

Reference:

- Abor, J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. *The Journal of Risk Finance*, 6 (5), 438-445.
- Ang, J. S., R. A. Cole, & J. W. Lin. (2000). Agency costs and ownership structure. *The Journal of Finance*, 55 (1), 81-106.
- Berger, A. N., & E. Bonaccorsi di Patti. (2006). Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking & Finance*, 30 (4), 1065-1102.
- Bevan, A. A., & J. Danbolt. (2004). Testing for inconsistencies in the estimation of UK capital structure determinants. *Applied Financial Economics*, 14 (1), 55-66.
- Bontempi, M. E. (2002). The dynamic specification of the modified pecking order theory: its relevance to Italy. *Empirical Economics*, 27 (1), 1-22.
- Braam, G. J., & E. J. Nijssen. (2004). Performance effects of using the balanced scorecard: a note on the Dutch experience. *Long range planning*, 37 (4), 335-349.
- Burgstahler, D. C., L. Hail, & C. Leuz. (2006). The importance of reporting incentives: earnings management in European private and public firms. *The accounting review*, 81 (5), 983-1016.
- Cheng, P., L. N. Su, & X. K. Zhu. (2012). Managerial ownership, board monitoring and firm performance in a family - concentrated corporate environment. *Accounting & Finance*, 52 (4), 1061-1081.
- Crabtree, A. D., & G. K. DeBusk. (2008). The effects of adopting the balanced scorecard on shareholder returns. *Advances in Accounting*, 24 (1), 8-15.
- Dang, V. A. (2011). Leverage, debt maturity and firm investment: An empirical analysis. *Journal of Business Finance & Accounting*, 38 (1 - 2), 225-258.
- Degeorge, F., & R. Zeckhauser. (1993). The reverse LBO decision and firm performance: Theory and evidence. *The Journal of Finance*, 48 (4), 1323-1348.
- Dessi, R., & D. Robertson. (2003). Debt, Incentives and Performance: Evidence from UK Panel Data*. *The Economic Journal*, 113 (490), 903-919.
- Dunne, T., M. J. Roberts, & L. Samuelson. (1989). The growth and failure of US manufacturing plants. *The Quarterly Journal of Economics*, 671-698.
- Feidakis, A., & A. Rovolis. (2007). Capital structure choice in European Union: evidence from the construction industry 1. *Applied Financial Economics*, 17 (12), 989-1002.
- Filbeck, G., & R. F. Gorman. (2000). Capital structure and asset utilization: the case of resource intensive industries. *Resources Policy*, 26 (4), 211-218.
- Ghosh, C., R. Nag, & C. Sirmans. (2000). The pricing of seasoned equity offerings: evidence from REITs. *Real Estate Economics*, 28 (3), 363-384.
- Ghosh, S. (2007). Leverage, managerial monitoring and firm valuation: a simultaneous equation approach. *Research in Economics*, 61 (2), 84-98.
- Gleason, K. C., L. K. Mathur, & I. Mathur. (2000). The interrelationship between culture, capital structure, and performance: evidence from European retailers. *Journal of Business Research*, 50 (2), 185-191.
- Grossman, S. J., & O. D. Hart. (1982). Corporate financial structure and managerial incentives. In *The economics of information and uncertainty*: University of Chicago Press, 107-140.
- Hadlock, C. J., & C. M. James. (2002). Do banks provide financial slack? *The Journal of Finance*, 57 (3), 1383-1419.
- Holz, C. A. (2002). The impact of the liability–asset ratio on profitability in China's industrial state-owned enterprises. *China Economic Review*, 13 (1), 1-26.
- Ittner, C. D., & D. F. Larcker. (1997). Quality strategy, strategic control systems, and organizational performance. *Accounting, Organizations and Society*, 22 (3), 293-314.
- Jain, B. A., & O. Kini. (1994). The post - issue operating performance of IPO firms. *The Journal of Finance*, 49 (5), 1699-1726.
- Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American economic review*, 323-329.
- Jensen, M. C., & W. H. Meckling. (1979). *Theory of the firm: Managerial behavior, agency costs, and ownership structure*: Springer.
- King, M. R., & E. Santor. (2008). Family values: Ownership structure, performance and capital structure of Canadian firms. *Journal of Banking & Finance*, 32 (11), 2423-2432.

- Konijn, S. J., R. Kräussl, & A. Lucas. (2011). Blockholder dispersion and firm value. *Journal of Corporate Finance*, 17 (5), 1330-1339.
- Kraus, A., & R. H. Litzenberger. (1973). A STATE - PREFERENCE MODEL OF OPTIMAL FINANCIAL LEVERAGE. *The Journal of Finance*, 28 (4), 911-922.
- Krishnan, V. S., & R. C. Moyer. (1997). Performance, capital structure and home country: an analysis of Asian corporations. *Global Finance Journal*, 8 (1), 129-143.
- Lööf, H., & A. Heshmati. (2006). On the relationship between innovation and performance: A sensitivity analysis. *Economics of Innovation and New Technology*, 15 (4-5), 317-344.
- Lappalainen, J., & M. Niskanen. (2012). Financial performance of SMEs: impact of ownership structure and board composition. *Management Research Review*, 35 (11), 1088-1108.
- Majumdar, S. K., & P. Chhibber. (1999). Capital structure and performance: Evidence from a transition economy on an aspect of corporate governance. *Public Choice*, 98 (3-4), 287-305.
- Margaritis, D., & M. Psillaki. (2010). Capital structure, equity ownership and firm performance. *Journal of Banking & Finance*, 34 (3), 621-632.
- Michaelas, N., F. Chittenden, & P. Poutziouris. (1999). Financial policy and capital structure choice in UK SMEs: Empirical evidence from company panel data. *Small business economics*, 12 (2), 113-130.
- Mikkelsen, W. H., M. Megan Partch, & K. Shah. (1997). Ownership and operating performance of companies that go public. *Journal of financial economics*, 44 (3), 281-307.
- Modigliani, F., & M. H. Miller. (1958). The cost of capital, corporation finance and the theory of investment. *The American economic review*, 261-297.
- Morri, G., & F. Cristanziani. (2009). What determines the capital structure of real estate companies?: An analysis of the EPRA/NAREIT Europe Index. *Journal of Property Investment & Finance*, 27 (4), 318-372.
- Myers, S. C., & N. S. Majluf. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics*, 13 (2), 187-221.
- Myers, S. (1984). The capital structure puzzle. *Journal of Finance* 39, 575-592.
- Nirajini, A., & K. Priya. (2013). Impact of Capital Structure on Financial Performance of the Listed Trading Companies in Sri Lanka. *International Journal of Scientific and Research Publications*, 459.
- Niu, X. (2008). Theoretical and practical review of capital structure and its determinants. *International Journal of Business and Management*, 3 (3), P133.
- Onaolapo, A. A., & S. O. Kajola. (2010). Capital structure and firm performance: evidence from Nigeria. *European Journal of Economics, Finance and Administrative Sciences*, 25, 70-82.
- Pagano, M., & F. Panetta. (1998). Why do companies go public? An empirical analysis. *The Journal of Finance*, 53 (1), 27-64.
- Qureshi, M. A., & T. Azid. (2006). Did they do it differently? Capital structure choices of public and private sectors in Pakistan. *The Pakistan Development Review*, 701-709.
- Rajan, R. G., & L. Zingales. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, 50 (5), 1421-1460.
- Rao, N. V., K. H. M. Al-Yahyaee, & L. A. Syed. (2007). Capital structure and financial performance: evidence from Oman. *Indian Journal of Economics and Business*, 6 (1), 1.
- Rovolis, A., & A. Feidakis. (2014). Evaluating the impact of economic factors on REITs' capital structure around the world. *Journal of Property Investment & Finance*, 32 (1), 5-20.
- Simerly, R. L., & M. Li. (2000). Environmental dynamism, capital structure and performance: a theoretical integration and an empirical test. *Strategic Management Journal*, 21 (1), 31-49.
- Soumadi, M. M., & O. S. Hayajneh. (2012). Capital Structure and corporate performance empirical study on the public Jordanian Shareholdings firms listed in the Amman Stock Market. *European Scientific Journal*, 8 (22).
- Stankevičienė, J., & R. Norvaišienė. (2007). The interaction of internal determinants and decisions on capital structure at the Baltic listed companies. *Engineering economics*, (2 (52), 7-17.
- Uadiale, O. M. (2010). The impact of board structure on corporate financial performance in Nigeria. *International Journal of Business and Management*, 5 (10), 155.
- Weill, L. (2008). Leverage and corporate performance: does institutional environment matter? *Small business economics*, 30 (3), 251-265.
- Westgaard, S., A. Eidet, S. Frydenberg, & T. C. Grosås. (2008). Investigating the capital structure of UK real estate companies. *Journal of Property Research*, 25 (1), 61-87.
- Williams, J. (1987). Perquisites, risk, and capital structure. *The Journal of Finance*, 42 (1), 29-48.
- Wipperf, R. F. (1966) . Financial Structure and the Value of the Firm. *The Journal of Finance*, 21 (4), 615-633.

Table 1: Variables Definitions

Variables	Definitions
ROA	A percentage of net income before deduction of minority interests if any multiplying 100 to total assets.
ROA_01	An indicator, equal to 1 if ROA is more and equal to the mean of ROA, 0 otherwise.
ROCE	A ratio of the sum of Profit before tax plus Interest paid multiplying 100 divided by the sum of Shareholders funds and Noncurrent liabilities.
LEV_ASST	A percentage of total liabilities (noncurrent liabilities + loan) to total assets multiplying 100.
LEV_EQIT	A percentage of total liabilities (noncurrent liabilities + loan) to equity multiplying 100.
CREDIT_RISK	An indicator variable equals to 1 in case of the firm is in credit risk status (including the status of Active (default of payment), the status of Active (insolvency proceedings), the status of Bankruptcy, the status of Dissolved (bankruptcy)); 0 otherwise.
CREDIT_RISK* LEV_ASST	A variable equal to CREDIT_RISK multiplies LEV_ASST
TANGIBLE	A ratio of fixed assets to total assets.
AGE	The natural logarithm of 1 plus years since firm's start to incorporate.
SIZE	The natural logarithm of firms' total assets.
PUBLIC	An indicator variable equals to 1 in case of public firm; 0 otherwise.
PATENTS	An indicator variable equals to 1 in case of the firm has the patents; 0 otherwise.
TRADEMARKS	An indicator variable equals to 1 in case of the firm has the bookmarks; 0 otherwise.
GROUP	An indicator variable equals to 1 in case of the firm belongs to a member of the group; 0 otherwise.
CURRENT	A percentage of current assets to current liabilities.
SYSTEM	An indicator variable equals to 1 in case of market based financial system, 0 in case of bank based financial system (capital market structure indicator from Burgsthaler et al. 2006).
LEGFOR	An indicator variable equals to 1 in case of strong legal system and enforcement; 0 otherwise (the quality of the legal system and enforcement indicator from Burgsthaler et al. 2006).
TAX	An indicator variable equals to 1 in case of financial accounts for external reporting and tax purposes are highly aligned; 0 otherwise tax-book conformity indicator from Burgsthaler et al. 2006).

Table 1: Variables Definations

Variables	Definitions
COUNTRY_TYPE	A country indicator variable defined AUSTIA as 1; defined BLEGIUM as 2; defined NETHERLAND as 3; defined PROTUGAL as 4; defined SPAIN as 5; defined UK as 6; defined FRANCE as 7; defined ITALY as 8; defined FINLAND as 9; defined SWEDEN as 10; defined GERMANY as 11.

Table 2: Descriptive statistics

Variables							
Continuous:	N	Mean	std.dev.	Median	Min	Max	VIF
ROA	58826	2,460	7,826	2,113	-44,859	57,208	-
LEV_ASST	58826	28,074	26,010	23,986	-3,306	1179,249	1,3172
TANGIBLE	58826	0,349	0,272	0,297	-0,102	1,033	1,3600
AGE	58826	2,988	0,837	3,091	0,000	6,865	1,1744
SIZE	58826	9,832	2,202	9,950	-1,580	20,300	2,2192
CURRENT	58826	1,942	3,360	1,324	0,000	98,773	1,0414
Discrete:	N	%	VIF	Discrete:	N	%	VIF
CREDIT_RISK=0	50669	86,13	2,4370	GROUP=0	14598	24,82	1,3074
CREDIT_RISK=1	8157	13,87		GROUP=1	44228	75,18	
PUBLIC=0	38316	65,13	1,4570	SYSTEM=0	19052	32,39	1,3058
PUBLIC=1	20510	34,87		SYSTEM=1	39774	67,61	
PATENTS=0	50404	85,68	1,3374	LEGFOR=0	30486	51,82	1,4534
PATENTS=1	8422	14,32		LEGFOR=1	28340	48,18	
TRADEMARKS=0	48454	82,37	1,2510	TAX=0	7371	12,53	1,5028
TRADEMARKS=1	10372	17,63		TAX=1	51455	87,47	

This table presents the descriptive statistics for the overall samples. N denotes the number of the cross section observations. Data covers the year in 2012. ROA is a percentage of net income before deduction of Minority interests if any multiplying 100 to total assets. LEV_ASST is a percentage of total liabilities (noncurrent liabilities + loan) to total assets multiplying 100. CREDIT_RISK is an indicator variable equal to 1 in case of the firm is in credit risk status (including the status of Active (default of payment), the status of Active (insolvency proceedings), the status of Bankruptcy, the status of Dissolved (bankruptcy)); 0 otherwise. TANGIBLE is a ratio of fixed assets to total assets. AGE is the natural logarithm if 1 plus years since firm's start to incorporate. SIZE is the natural logarithm of firms' total assets. PUBLIC is an indicator variable equals to 1 in case of public firm; equal to 0 in case of private firm. PATENTS is an indicator variable equals to 1 in case of the firm has the patents, 0 otherwise. TRADEMARKS is an indicator variable equals to 1 in case of the firm has the bookmarks, 0 otherwise. GROUP is an indicator equals to 1 in case of the firm belongs to the group, 0 otherwise. CURRENT is a percentage of current assets to current liabilities. SYSTEM is an indicator variable equals to 1 in case of market based financial system, 0 in case of bank based financial

system (capital market structure indicator from Burgsthaler et. al 2006). LEGFOR is an indicator variable equals to 1 in case of strong legal system and enforcement; 0 otherwise (the quality of the legal system and enforcement indicator from Burgsthaler et al. 2006). TAX is an indicator variable equals to 1 in case of financial accounts for external reporting and tax purposes are highly aligned; 0 otherwise tax-book conformity indicator from Burgsthaler et al. 2006). COUNTRY_TYPE is a country indicator variable defined AUSTIA as 1; defined BLEGIUM as 2; defined NETHERLAND as 3; defined PROTUGAL as 4; defined SPAIN as 5; defined UK as 6; defined FRANCE as 7; defined ITALY as 8; defined FINLAND as 9; defined SWEDEN as 10; defined GERMANY as 11. VIF denotes variance average of inflation factors of regression variables in all regressions N denotes the number of cross-section observation. Data covers the year in 2012.

Table 3: Univariate tests

Comparisons by CREDIT_RISK								
Sample restriction Variables	Column 1			Column 2			Column 3	
	CREDIT_RISK=1(N=8157)			CREDIT_RISK=0(N=50669)			Comparisons	
Continuous:	Mean	(Median)	std.dev.	Mean	(Median)	std.dev.	Diff.	p-value
ROA	-5,784		10,156	3,787		6,465	-9,571	0,000
	-2,670			2,723			-5,393	0,000
LEV_ASST	38,286		41,871	26,430		21,994	11,856	0,000
	32,008			23,072			8,936	0,000
TANGIBLE	0,382		0,323	0,344		0,263	0,038	0,000
	0,304			0,296			0,008	0,000
AGE	2,498		0,819	3,067		0,813	-0,569	0,000
	2,565			3,135			-0,571	0,000
SIZE	6,527		1,829	10,364		1,747	-3,837	0,000
	6,360			10,265			-3,905	0,000
CURRENT	1,844		5,260	1,958		2,942	-0,114	0,004
	1,008			1,377			-0,369	0,000
Discrete:	%			%			Diff.	p-value
CREDIT_RISK=1	100,00			0,00			-	-
PUBLIC=1	1,90			33,00			-31,10	0,000
PATENTS=1	0,40			13,90			-13,50	0,000
TRADEMARKS=1	0,40			17,20			-16,80	0,000
GROUP=1	4,00			71,20			-67,20	0,000
SYSTEM=1	8,30			59,30			-51,00	0,000
LEGFOR=1	4,40			43,80			-39,40	0,000

TAX=1	13,40	74,10	-60,70 0,000
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This table presents the univariate comparisons by CREDIT_RISK. For continuous variables, the reported statistics are differences in means and the t-statistic is for independent samples mean comparison t test, and differences in medians and the z –statistic is for Wilcoxon Mann-Whitney test. For discrete variables, the reported statistics are differences in relative frequencies and the reported p-value is for Pearson’s chi-squared test. N denotes the number of the cross section observations. Data covers the year in 2012. Difference significant at the 5% lever or better are reported in bold. ROA is a percentage of net income before deduction of Minority interests if any multiplying 100 to total assets. LEV_ASST is a percentage of total liabilities (noncurrent liabilities + loan) to total assets multiplying 100. CREDIT_RISK is an indicator variable equal to 1 in case of the firm is in credit risk status (including the status of Active (default of payment), the status of Active (insolvency proceedings), the status of Bankruptcy, the status of Dissolved (bankruptcy)); 0 otherwise. TANGIBLE is a ratio of fixed assets to total assets. AGE is the natural logarithm if 1 plus years since firm's start to incorporate. SIZE is the natural logarithm of firms' total assets. PUBLIC is an indicator variable equals to 1 in case of public firm; equal to 0 in case of private firm. PATENTS is an indicator variable equals to 1 in case of the firm has the patents, 0 otherwise. TRADEMARKS is an indicator variable equals to 1 in case of the firm has the bookmarks, 0 otherwise. GROUP is an indicator equals to 1 in case of the firm belongs to the group, 0 otherwise. CURRENT is a percentage of current assets to current liabilities. SYSTEM is an indicator variable equals to 1 in case of market based financial system, 0 in case of bank based financial system (capital market structure indicator from Burgsthaler et. al 2006). LEGFOR is an indicator variable equals to 1 in case of strong legal system and enforcement; 0 otherwise (the quality of the legal system and enforcement indicator from Burgsthaler et al. 2006). TAX is an indicator variable equals to 1 in case of financial accounts for external reporting and tax purposes are highly aligned; 0 otherwise tax-book conformity indicator from Burgsthaler et al. 2006). COUNTRY_TYPE is a country indicator variable defined AUSTIA as 1; defined BLEGIUM as 2; defined NETHERLAND as 3; defined PROTUGAL as 4; defined SPAIN as 5; defined UK as 6; defined FRANCE as 7; defined ITALY as 8; defined FINLAND as 9; defined SWEDEN as 10; defined GERMANY as 11.

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Table 4: correlations

	ROA	LEV_ASST	CREDIT_RISK	TANGIBLE	AGE	SIZE	PUBLIC	PATENTS	TRADEMARKS	GROUP	CURRENT	SYSTEM	LEGFOR	TAX	Country_type
ROA	1	-,234**	-,423**	-,132**	,073**	,225**	-0,008	,071**	,065**	,165**	,089**	0,006	,128**	-,104**	,082**
LEV_ASST	-,234**	1	,158**	,329**	-,038**	,071**	-,025**	0,006	0,006	-,027**	0,007	-0,005	-,100**	,018**	,062**
CREDIT_RISK	-,423**	,158**	1	,048**	-,235**	-,602**	-,180**	-,132**	-,152**	-,430**	-,012**	-,066**	-,132**	,109**	-,067**
TANGIBLE	-,132**	,329**	,048**	1	0,008	,222**	,033**	,025**	,031**	,047**	-,134**	-0,008	-,046**	,024**	,066**
AGE	,073**	-,038**	-,235**	0,008	1	,276**	,199**	,194**	,172**	,177**	,037**	,084**	-,033**	-,027**	-0,002
SIZE	,225**	,071**	-,602**	,222**	,276**	1	,258**	,261**	,292**	,497**	,027**	,309**	-,019**	-,257**	,121**
PUBLIC	-0,008	-,025**	-,180**	,033**	,199**	,258**	1	,082**	,157**	,085**	-,036**	,114**	-,231**	,197**	-,270**
PATENTS	,071**	0,006	-,132**	,025**	,194**	,261**	,082**	1	,397**	,156**	,036**	,080**	-,038**	-,025**	,118**
TRADEMARKS	,065**	0,006	-,152**	,031**	,172**	,292**	,157**	,397**	1	,168**	,024**	,121**	-,069**	-,049**	,053**
GROUP	,165**	-,027**	-,430**	,047**	,177**	,497**	,085**	,156**	,168**	1	0,003	,175**	,041**	-,176**	,109**
CURRENT	,089**	0,007	-,012**	-,134**	,037**	,027**	-,036**	,036**	,024**	0,003	1	,028**	-,011**	0,008	,054**
SYSTEM	0,006	-0,005	-,066**	-0,008	,084**	,309**	,114**	,080**	,121**	,175**	,028**	1	,047**	-,262**	,110**
LEGFOR	,128**	-,100**	-,132**	-,046**	-,033**	-,019**	-,231**	-,038**	-,069**	,041**	-,011**	,047**	1	-,393**	-,175**
TAX	-,104**	,018**	,109**	,024**	-,027**	-,257**	,197**	-,025**	-,049**	-,176**	0,008	-,262**	-,393**	1	,141**
Country_type	,082**	,062**	-,067**	,066**	-0,002	,121**	-,270**	,118**	,053**	,109**	,054**	,110**	-,175**	,141**	1

This table presents Pearson correlations. **. Data cover the year 2012 and contains 61766 observations. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed). ROA is a percentage of net income before deduction of Minority interests if any multiplying 100 to total assets. LEV_ASST is a percentage of total liabilities (noncurrent liabilities + loan) to total assets multiplying 100. CREDIT_RISK is an indicator variable equal to 1 in case of the firm is in credit risk status (including the status of Active (default of payment), the status of Active (insolvency proceedings), the status of Bankruptcy, the status of Dissolved (bankruptcy)); 0 otherwise. TANGIBLE is a ratio of fixed assets

to total assets. AGE is the natural logarithm of 1 plus years since firm's start to incorporate. SIZE is the natural logarithm of firms' total assets. PUBLIC is an indicator variable equals to 1 in case of public firm; equal to 0 in case of private firm. PATENTS is an indicator variable equals to 1 in case of the firm has the patents, 0 otherwise. TRADEMARKS is an indicator variable equals to 1 in case of the firm has the trademarks, 0 otherwise. GROUP is an indicator equals to 1 in case of the firm belongs to the group, 0 otherwise. CURRENT is a percentage of current assets to current liabilities. SYSTEM is an indicator variable equals to 1 in case of market based financial system, 0 in case of bank based financial system (capital market structure indicator from Burgsthaler et. al 2006). LEGFOR is an indicator variable equals to 1 in case of strong legal system and enforcement; 0 otherwise (the quality of the legal system and enforcement indicator from Burgsthaler et al. 2006). TAX is an indicator variable equals to 1 in case of financial accounts for external reporting and tax purposes are highly aligned; 0 otherwise tax-book conformity indicator from Burgsthaler et al. 2006). COUNTRY_TYPE is a country indicator variable defined AUSTRIA as 1; defined BELGIUM as 2; defined NETHERLAND as 3; defined PORTUGAL as 4; defined SPAIN as 5; defined UK as 6; defined FRANCE as 7; defined ITALY as 8; defined FINLAND as 9; defined SWEDEN as 10; defined GERMANY as 11.

Table 5-A: Main results: OLS Regression Results

	Column 1		Column 2	
Dependent Variable	ROA(Model 1)		ROA(Model 2)	
Sample Restriction	Full Sample		Full sample	
Independet Variables	Coef.	P-value	Coef.	P-value
Intercept	6,073***	0,000	6,669***	0,000
LEV_ASST	-0,048***	0,000	-0,081***	0,000
CREDIT_RISK	-8,593***	0,000	-11,356***	0,000
CREDIT_RISK* LEV_ASST			0,083***	0,000
TANGIBLE	-1,882***	0,000	-1,435***	0,000
AGE	-0,192***	0,000	-0,231***	0,000
SIZE	0,104***	0,000	0,134***	0,000
PUBLIC	-0,536***	0,000	-0,565***	0,000
PATENTS	0,290***	0,002	0,304***	0,001
TRADEMARKS	0,206**	0,014	0,210**	0,011
GROUP	-0,457***	0,000	-0,574***	0,000
CURRENT	0,170***	0,000	0,154***	0,000
SYSTEM	-0,815***	0,000	-0,914***	0,000
LEGFOR	0,776***	0,000	0,757***	0,000
TAX	-1,209***	0,000	-1,179***	0,000
Country_type	0,191***	0,000	0,221***	0,000
Industry controls	YES		YES	
N	58826		58826	
Adjusted R ²	0,233		0,250	

This table presents the ordinary least square estimation of models in full sample. N denotes the number of the cross section observations per model. Data covers the year in 2012. Coefficient significant at 10% level or better are reported in bold. ROA is a percentage of net income before deduction of Minority interests if any multiplying 100 to total assets. LEV_ASST is a percentage of total liabilities (noncurrent liabilities + loan) to total assets multiplying 100. CREDIT_RISK is an indicator variable equal to 1 in case of the firm is in credit risk status (including the status of Active (default of payment), the status of Active (insolvency proceedings), the status of Bankruptcy, the status of Dissolved (bankruptcy)); 0 otherwise. CREDIT_RISK*LEV_ASST is an interaction which equal to CREDIT_RISK multiplying LEV_ASST. TANGIBLE is a ratio of fixed assets to total assets. AGE is the natural logarithm if 1 plus years since firm's start to incorporate. SIZE is the natural logarithm of firms' total assets. PUBLIC is an indicator variable equals to 1 in case of public firm; equal to 0 in case of private firm. PATENTS is an indicator variable equals to 1 in

case of the firm has the patents, 0 otherwise. TRADEMARKS is an indicator variable equals to 1 in case of the firm has the bookmarks, 0 otherwise. GROUP is an indicator equals to 1 in case of the firm belongs to the group, 0 otherwise. CURRENT is a percentage of current assets to current liabilities. SYSTEM is an indicator variable equals to 1 in case of market based financial system, 0 in case of bank based financial system (capital market structure indicator from Burgsthaler et. al 2006). LEGFOR is an indicator variable equals to 1 in case of strong legal system and enforcement; 0 otherwise (the quality of the legal system and enforcement indicator from Burgsthaler et al. 2006). TAX is an indicator variable equals to 1 in case of financial accounts for external reporting and tax purposes are highly aligned; 0 otherwise tax-book conformity indicator from Burgsthaler et al. 2006). COUNTRY_TYPE is a country indicator variable defined AUSTIA as 1; defined BLEGIUM as 2; defined NETHERLAND as 3; defined PROTUGAL as 4; defined SPAIN as 5; defined UK as 6; defined FRANCE as 7; defined ITALY as 8; defined FINLAND as 9; defined SWEDEN as 10; defined GERMANY as 11.

Table 5-B: Main results: by full sample, risk and non-risk subsamples

	Column 1		Column 2		Column 3	
Dependent Variable	ROA(Model 1)		ROA(Model 1)		ROA(Model 1)	
Sample Restriction	Full Sample		Risk (CREDIT_RISK=1)		Non Risk (CREDIT_RISK=0)	
Independet Variables	Coef.	P-value	Coef.	P-value	Coef.	P-value
Intercept	-4,937***	0,000	-9,144***	0,000	7,329***	0,000
LEV_ASST	-0,063***	0,000	0,005*	0,052	-0,076***	0,000
TANGIABLE	-3,399***	0,000	-2,463***	0,000	-1,018***	0,000
AGE	-0,042	0,266	-1,379***	0,000	-0,121***	0,001
SIZE	0,963***	0,000	1,509***	0,000	-0,113***	0,000
PUBLIC	-0,186**	0,014	-1,862***	0,000	-0,533***	0,000
PATENTS	-0,129	0,193	-1,845***	0,008	0,463***	0,000
TRADEMARKS	0,032	0,712	-5,129***	0,000	0,424***	0,000
GROUP	0,579***	0,000	-2,371***	0,000	-0,291***	0,000
CURRENT	0,153***	0,000	0,056***	0,006	0,206***	0,000
SYSTEM	-1,752***	0,000	-5,117***	0,000	0,136**	0,043
LEGFOR	1,904***	0,000	1,645***	0,000	1,120***	0,000
TAX	-0,336***	0,002	-0,715	0,266	-0,765***	0,000
Country_type	0,248***	0,000	0,652***	0,000	0,149***	0,000
Industry controls	YES		YES		YES	
N	58826		8157		50669	
Adjusted R ²	0,161		0,129		0,114	

This table presents the ordinary least square estimation of models in full and sub sample. N denotes the number of the cross section observations per model. Data covers the year in 2012. Coefficient significant at

10% level or better are reported in bold. ROA is a percentage of net income before deduction of Minority interests if any multiplying 100 to total assets. LEV_ASST is a percentage of total liabilities (noncurrent liabilities + loan) to total assets multiplying 100. CREDIT_RISK is an indicator variable equal to 1 in case of the firm is in credit risk status (including the status of Active (default of payment), the status of Active (insolvency proceedings), the status of Bankruptcy, the status of Dissolved (bankruptcy)); 0 otherwise. CREDIT_RISK*LEV_ASST is an interaction which equal to CREDIT_RISK multiplying LEV_ASST. TANGIBLE is a ratio of fixed assets to total assets. AGE is the natural logarithm if 1 plus years since firm's start to incorporate. SIZE is the natural logarithm of firms' total assets. PUBLIC is an indicator variable equals to 1 in case of public firm; equal to 0 in case of private firm. PATENTS is an indicator variable equals to 1 in case of the firm has the patents, 0 otherwise. TRADEMARKS is an indicator variable equals to 1 in case of the firm has the bookmarks, 0 otherwise. GROUP is an indicator equals to 1 in case of the firm belongs to the group, 0 otherwise. CURRENT is a percentage of current assets to current liabilities. SYSTEM is an indicator variable equals to 1 in case of market based financial system, 0 in case of bank based financial system (capital market structure indicator from Burgsthaler et. al 2006). LEGFOR is an indicator variable equals to 1 in case of strong legal system and enforcement; 0 otherwise (the quality of the legal system and enforcement indicator from Burgsthaler et al. 2006). TAX is an indicator variable equals to 1 in case of financial accounts for external reporting and tax purposes are highly aligned; 0 otherwise tax-book conformity indicator from Burgsthaler et al. 2006). COUNTRY_TYPE is a country indicator variable defined AUSTIA as 1; defined BLEGIUM as 2; defined NETHERLAND as 3; defined PROTUGAL as 4; defined SPAIN as 5; defined UK as 6; defined FRANCE as 7; defined ITALY as 8; defined FINLAND as 9; defined SWEDEN as 10; defined GERMANY as 11.

Table 5-C: Main results: Logistic Regression Results

	Column 1		Column 2	
Dependent Variable	ROA_01(Model 1)		ROA_01(Model 2)	
Sample Restriction	Full Sample		Full sample	
Independet Variables	Coef.	P-value	Coef.	P-value
Intercept	0,738***	0,000	0,839***	0,000
LEV_ASST	-0,021***	0,000	-0,024***	0,000
CREDIT_RISK	-1,557***	0,000	-2,031***	0,000
CREDIT_RISK* LEV_ASST			0,017***	0,000
TANGIBLE	-0,173***	0,000	-0,165***	0,000
AGE	0,013	0,261	0,011	0,341
SIZE	-0,013*	0,062	-0,015**	0,027
PUBLIC	-0,119***	0,000	-0,118***	0,000
PATENTS	0,211***	0,000	0,216***	0,000
TRADEMARKS	0,175***	0,000	0,179***	0,000
GROUP	0,032	0,190	0,022	0,365
CURRENT	0,054***	0,000	0,048***	0,000
SYSTEM	-0,072***	0,001	-0,078***	0,000

Table 5-C: Main results: Logistic Regression Results

	Column 1		Column 2	
Dependent Variable	ROA_01(Model 1)		ROA_01(Model 2)	
Sample Restriction	Full Sample		Full sample	
Independet Variables	Coef.	P-value	Coef.	P-value
LEGFOR	0,313***	0,000	0,317***	0,000
TAX	-0,424***	0,000	-0,430***	0,000
Country_type	0,041***	0,000	0,044***	0,000
Industry controls	YES		YES	
N	58826		58826	
Pseudo (Nagalkerke) R ²	0,184		0,188	

This table presents logistic regression models in full sample. N denotes the number of the cross section observations per model. Data covers the year in 2012. Coefficient significant at 10% level or better are reported in bold. ROA_01 is an indicator equals to 1 in case of ROA $\geq 2,460$, 0 in case of ROA $< 2,460$. ROA is a percentage of net income before deduction of Minority interests if any multiplying 100 to total assets. LEV_ASST is a percentage of total liabilities (noncurrent liabilities + loan) to total assets multiplying 100. CREDIT_RISK is an indicator variable equal to 1 in case of the firm is in credit risk status (including the status of Active (default of payment), the status of Active (insolvency proceedings), the status of Bankruptcy, the status of Dissolved (bankruptcy)); 0 otherwise. CREDIT_RISK*LEV_ASST is an interaction which equal to CREDIT_RISK multiplying LEV_ASST. TANGIBLE is a ratio of fixed assets to total assets. AGE is the natural logarithm if 1 plus years since firm's start to incorporate. SIZE is the natural logarithm of firms' total assets. PUBLIC is an indicator variable equals to 1 in case of public firm; equal to 0 in case of private firm. PATENTS is an indicator variable equals to 1 in case of the firm has the patents, 0 otherwise. TRADEMARKS is an indicator variable equals to 1 in case of the firm has the bookmarks, 0 otherwise. GROUP is an indicator equals to 1 in case of the firm belongs to the group, 0 otherwise. CURRENT is a percentage of current assets to current liabilities. SYSTEM is an indicator variable equals to 1 in case of market based financial system, 0 in case of bank based financial system (capital market structure indicator from Burgsthaler et. al 2006). LEGFOR is an indicator variable equals to 1 in case of strong legal system and enforcement; 0 otherwise (the quality of the legal system and enforcement indicator from Burgsthaler et al. 2006). TAX is an indicator variable equals to 1 in case of financial accounts for external reporting and tax purposes are highly aligned; 0 otherwise tax-book conformity indicator from Burgsthaler et al. 2006). COUNTRY_TYPE is a country indicator variable defined AUSTIA as 1; defined BLEGIUM as 2; defined NETHERLAND as 3; defined PROTUGAL as 4; defined SPAIN as 5; defined UK as 6; defined FRANCE as 7; defined ITALY as 8; defined FINLAND as 9; defined SWEDEN as 10; defined GERMANY as 11.

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Table 6: Sensitivity analysis: sensitivity to age, size and public or private forms

	Column 1		Column 2		Column 3		Column 4		Column 5		Column 6		Column 7		Column 8		Column 9		Column 10		Column 11		Column 12	
Dependent Variable	ROA(Model 1)		ROA(Model 2)		ROA(Model 1)		ROA(Model 2)		ROA(Model 1)		ROA(Model 2)		ROA(Model 1)		ROA(Model 2)		ROA(Model 1)		ROA(Model 2)		ROA(Model 1)		ROA(Model 2)	
Sample Restriction	Sensitivity to AGE				Sensitivity to AGE				Sensitivity to SIZE				Sensitivity to SIZE				Sensitivity to PUBLIC				Sensitivity to PUBLIC			
	AGE>=2,988		AGE>=2,988		AGE<2,988		AGE<2,988		SIZE>=9,832		SIZE>=9,832		SIZE<9,832		SIZE<9,832		PUBLIC		PUBLIC		PRIVATE		PRIVATE	
Independet Variables	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value	Coef.	P-value
Intercept	4,835	0,000	5,101	0,000	7,450	0,000	8,295	0,000	6,153	0,000	6,165	0,000	1,086	0,101	2,609	0,000	4,624	0,000	4,853	0,000	6,275	0,000	6,930	0,000
LEV_ASST	-0,059	0,000	-0,078	0,000	-0,038	0,000	-0,082	0,000	-0,062	0,000	-0,064	0,000	-0,039	0,000	-0,105	0,000	-0,050	0,000	-0,078	0,000	-0,046	0,000	-0,082	0,000
CREDIT_RISK	-8,802	0,000	-11,299	0,000	-8,663	0,000	-11,489	0,000	-6,380	0,000	-9,672	0,000	-7,694	0,000	-10,758	0,000	-9,479	0,000	-13,051	0,000	-8,317	0,000	-10,975	0,000
CREDIT_RISK* LEV_ASST			0,069	0,000			0,090	0,000			0,056	0,000			0,104	0,000			0,087	0,000			0,084	0,000
TANGIABLE	-1,773	0,000	-1,462	0,000	-2,071	0,000	-1,505	0,000	-1,172	0,000	-1,146	0,000	-2,058	0,000	-1,492	0,000	-1,316	0,000	-0,762	0,000	-2,143	0,000	-1,733	0,000
AGE	-0,492	0,000	-0,476	0,000	0,191	0,018	0,073	0,357	0,134	0,001	0,135	0,001	-0,723	0,000	-0,758	0,000	-0,268	0,000	-0,304	0,000	-0,156	0,001	-0,191	0,000
SIZE	0,184	0,000	0,200	0,000	0,072	0,031	0,116	0,000	-0,023	0,417	-0,020	0,470	0,835	0,000	0,785	0,000	0,107	0,001	0,136	0,000	0,154	0,000	0,191	0,000
PUBLIC	-0,633	0,000	-0,677	0,000	-0,395	0,001	-0,380	0,002	-0,522	0,000	-0,519	0,000	-0,568	0,000	-0,600	0,000								
PATENTS	0,278	0,008	0,282	0,007	0,127	0,497	0,154	0,402	0,384	0,000	0,384	0,000	-0,067	0,761	0,108	0,618	0,443	0,001	0,410	0,001	0,166	0,206	0,209	0,108
TRADEMARKS	0,302	0,001	0,301	0,001	-0,059	0,707	-0,075	0,628	0,349	0,000	0,346	0,000	-0,314	0,104	-0,286	0,132	0,097	0,371	0,061	0,572	0,310	0,011	0,334	0,005
GROUP	-0,191	0,049	-0,253	0,009	-0,791	0,000	-0,933	0,000	-0,209	0,079	-0,219	0,066	-0,726	0,000	-0,775	0,000	-0,134	0,241	-0,241	0,033	-0,652	0,000	-0,759	0,000
CURRENT	0,180	0,000	0,168	0,000	0,155	0,000	0,143	0,000	0,151	0,000	0,148	0,000	0,189	0,000	0,163	0,000	0,250	0,000	0,233	0,000	0,148	0,000	0,132	0,000
SYSTEM	-0,205	0,016	-0,267	0,002	-1,579	0,000	-1,703	0,000	0,053	0,569	0,043	0,643	-1,352	0,000	-1,560	0,000	-0,137	0,211	-0,231	0,033	-1,447	0,000	-1,578	0,000

LEGFOR	1,350	0,000	1,318	0,000	0,079	0,457	0,080	0,446	0,776	0,000	0,780	0,000	0,822	0,000	0,754	0,000	1,077	0,000	1,159	0,000	0,326	0,000	0,288	0,001
TAX	-0,516	0,000	-0,521	0,000	-2,049	0,000	-1,978	0,000	-1,167	0,000	-1,164	0,000	-1,331	0,000	-0,730	0,003	-0,519	0,036	-0,471	0,055	-1,873	0,000	-1,855	0,000
Country_type	0,197	0,000	0,212	0,000	0,193	0,000	0,234	0,000	0,101	0,000	0,104	0,000	0,281	0,000	0,293	0,000	0,101	0,000	0,141	0,000	0,263	0,000	0,295	0,000
Industry controls	YES		YES		YES		YES		YES		YES		YES		YES		YES		YES		YES		YES	
N	30892		30892		27934		27934		32627		32627		26199		26199		20510		20510		38316		38316	
Adjusted R ²	0,234		0,243		0,240		0,261		0,121		0,122		0,285		0,307		0,195		0,213		0,250		0,267	

This table presents the ordinary least square estimation of models in sub sample. N denotes the number of the cross section observations per model. Data covers the year in 2012. Coefficient significant at 10% level or better are reported in bold. ROA is a percentage of net income before deduction of Minority interests if any multiplying 100 to total assets. LEV_ASST is a percentage of total liabilities (noncurrent liabilities + loan) to total assets multiplying 100. CREDIT_RISK is an indicator variable equal to 1 in case of the firm is in credit risk status (including the status of Active (default of payment), the status of Active (insolvency proceedings), the status of Bankruptcy, the status of Dissolved (bankruptcy)); 0 otherwise. CREDIT_RISK*LEV_ASST is an interaction which equal to CREDIT_RISK multiplying LEV_ASST. TANGIBLE is a ratio of fixed assets to total assets. AGE is the natural logarithm if 1 plus years since firm's start to incorporate. SIZE is the natural logarithm of firms' total assets. PUBLIC is an indicator variable equals to 1 in case of public firm; equal to 0 in case of private firm. PATENTS is an indicator variable equals to 1 in case of the firm has the patents, 0 otherwise. TRADEMARKS is an indicator variable equals to 1 in case of the firm has the bookmarks, 0 otherwise. GROUP is an indicator equals to 1 in case of the firm belongs to the group, 0 otherwise. CURRENT is a percentage of current assets to current liabilities. SYSTEM is an indicator variable equals to 1 in case of market based financial system, 0 in case of bank based financial system (capital market structure indicator from Burgsthaler et. al 2006). LEGFOR is an indicator variable equals to 1 in case of strong legal system and enforcement; 0 otherwise (the quality of the legal system and enforcement indicator from Burgsthaler et al. 2006). TAX is an indicator variable equals to 1 in case of financial accounts for external reporting and tax purposes are highly aligned; 0 otherwise tax-book conformity indicator from Burgsthaler et al. 2006). COUNTRY_TYPE is a country indicator variable defined AUSTIA as 1; defined BLEGIUM as 2; defined NETHERLAND as 3; defined PROTUGAL as 4; defined SPAIN as 5; defined UK as 6; defined FRANCE as 7; defined ITALY as 8; defined FINLAND as 9; defined SWEDEN as 10; defined GERMANY as 11.

AN INTEGRATIVE PERSPECTIVE ON THE CONTEMPORARY FINANCIAL SECTOR: SOCIETAL COSTS VERSUS MONETARY BENEFITS

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Abstract. *Economic cycles are characterized by economic booms, stagnancies, recessions and finally again economic upturns. However, the period between the previous crisis of 2008 and its followed crises and today was not really a noticeable economic upturn, but experts alert since the beginning of this year about one economic recession. How comes that the modern society faces record levels of economic added value, measured by the GDP on the one side, and record levels of (national) debts, unpleasant economic figures such as poverty or unemployment, although main collective challenges get continuously delayed such as tangible investments into environmental care.*

This paper analyses the roots of this global monetary undersupply and shift towards undiscovered areas of society, elaborates coherences between such financial structures and its consequences to nation-states, the economy, society and individuals as well as finally, summarizes the contemporary financial and overall structure by examining literature of partly long experiences and comprehensive statistics. Closed system, including nation-states and communities, organizations, financial players but also individuals, tend to spiritual patterns of “Living in the moment” movements in term of solving problems as well as tend to hide major circumstances of the overall global system, and if there is one, which one?

Introduction

The origin of the term and value *growth* within society, economy and financial markets, leans back to several historical periods, such as intensively to the nation building period of the United States in the 19th century, which has shaped the societal value of the term also beyond the US. The American population increased at a rate that implied a doubling every twenty-three years between 1840 and 1860 (Bodenhorn 2000, p. 2 f.).

According to recent points of views, a broad consensus is still dominating the finance sector, modern politics, economy and consequently society in general – “*the neoliberal doctrine of salvation*”, in which boundless growth is still incessantly propagated as the cure and solution of contemporary economic and societal issues (Michalitsch 2006; Rosa 2009). In this aspect Young (2013) describes the financialization as the increasing value as well as the societal interference of institutional structures of global financial markets. The question arises about the effectivity of major patterns of thinking in history in terms of problem-solving the incessantly growing present global issues or whether the contemporary problem solvation structure of shifting problems from one to another aggravate the issues including its consequences until their magnitudes achieve hardly solvable magnitudes and thus convert to unmanageable crises. Experts and economists such as Stieglitz (2013), Wichterich (2011), Michalitsch (2006) or Christian Felber (2009) more often refer to the inherent growth of economic instability. We are heading the mistakes and problem solving structures of the reigns shortly before the French Revolution in 1789, by thinking that we may cope everything, because we do so pretty well in

the past and present. Combining record levels of national debts, un- and underemployment rates, decreasing wage rates and consequently consumption powers, increasing poverty rates, the deteriorating ecological and planetary situation, the intangible gap between rich and poor as well as the third and first world, (inter-) national social and political tensions as few contemporary examples, which weakens the economic cycle, with upcoming by trend growing economic recessions questions the resolvability of upcoming financial and economic crises (Popp 2013; Michalitsch 2006; Castel 2006; Proissl 2015).

These mentioned aspects above represent only a small part of the contemporary global unspoken problematic regarding the nearly completely unregulated financial global market, which has adopted and exists on its own rules. Whereas the capital turnover rate takes at least a couple of hours, days or longer in the economic system, in the financial markets it takes sometimes less than a few seconds. While the global GDP is measured by around € 70 billion, only the amount of traded equity warranty exceeds the € 700 billion thresholds.

However, the negative financial consequences affect directly and in its entire magnitude (intangible scopes of consequences) global society through the societal subsystem: the economy (e.g. Wichterich 2011; Stiglitz 2003, 2013; Young 2013; Epstein 2005). For numerous nations, cities, business especially in the small and medium sized segment as well as numerous individuals, the financial crisis of 2008 and its consequences are still not finished. Other examples such as South-European economies or the prevailing case of Volkswagen symbolize precursors of the unlimited and intangible possible consequences of the contemporary dominating financial and economic system.

This paper aims to contribute to the literature analysing financial markets issues by examining the political and economy origins and structures of financial markets including their purposes, transformed to their contemporary global role, the structures of financial markets themselves and the pattern as well as magnitude of already existing global consequences in order to better understand the contemporary financial excesses and why the contemporary way of problem solving represents only a shift of these issues and why this pattern may only enlarge these serious global crises instead of solving them (Andrianova et al. 2008; Michalitsch 2006; Wichterich 2011; Stiglitz 2013; Popp 2013; Felber 2009). The question arises how deep the mistake of our common effort might be that we are facing such difficult global deteriorations and developments?

Historical background (and the original role) of financial sector and system

The emergence of a monetary and interest system

Without questioning the key role and importance of the monetary system in an advanced (global) society, statements of broad economists that a structured economy is based on a monetary system or requires a monetary structure is according to Popp (2013, 19f.) disapproved by the existence of oriental advanced civilisations without such systems characterized by their economic prosperities. In order to understand the fundamental principles of money, it has to be differentiated between two basic functions of money – *the objective value* of a currency versus the *intermediation-function* of certain values such as abilities or labour output. In the era before the monetary bank system, advanced civilisations such as in Persia, Egypt or India had already differentiation of labour structures based on the trade of quasi-monetary means of exchange of high value such as camels. By the time precious metal coins such as Gold and Silber got established as official means of trade. The desire after these noble coins led to the situation that these values were more frequently stored in the households, which led in combination with the overall rarity of Gold and Silber to a lack of economic power and monetary undersupply, because investments were frozen, because of the lack of means of trade. Consequently, the

owners of coins had to be motivated to borrow their wealth for new investments and consumption – the interest system was born, as the owners of gold got more coins in return for their investment (Popp 2013).

One basic problem has been born, that money was not only bound on the exchange of labour and abilities, their lenders increased their money stock without working. This is the basis of social inequalities, because the small and middle economist is confronted with losses of the interest rate and those who own already this scarce resource earn more without labour performances and thus got continuously wealthier at the costs of the rest. As a fact, the economy has become vulnerable to blackmail through the power of the shareholders as well as this emerging new monopoly positions of money is the origin of capitalism and the allegedly growing gap between rich and poor including all its consequences such as the monetary, social or political two-class society. In certain religions interest business is or was tried to be undermined or was at least declared as unethically. Still today this coherence is too little discussed in the broad financial context, although it represents one essential cause for the contemporary form of globalization challenges and mass impoverishment (Popp 2013).

Accelerated by the colonialization the states tried to accumulate the maximum magnitude of this rare and shining noble metal through foreign trade by developing more crucial methods such as in India, for instance, where millions of Indians got enslaved or killed due to alleged misdemeanours. The power of capital shifted towards note banks, because at a point of time it got impossible for major merchants to carry such amounts of golds for their business. With the privilege of changing these notes at any time to gold, bank notes established themselves as the new means of exchange, which resulted in an economic boom and a consequently constant increase of monetary amounts until the gold amount for the gold coverage was (more than) exhausted. Governments gave the banks the permission of printing more money than could be covered with gold by the quadruple amount in England in the 18th and 19th century, which resulted into a further vast growing economy, until a multiple amount of money than gold was in circulation (Popp 2013, 23 f.).

The construction of this monetary system was full of risks and in 1846 it led indeed to an economic crisis, because England had to purchase its corn and potatoes from abroad due to a bad harvest in that year. The costs of these basic foods amounted several millions British Pounds, which had to be paid in gold, because the foreign trade partners did not accepted the British bank notes. This put the British government under pressure, because in order to pay this amount, the quad precision of money had to be taken from the market by quitting the loans of citizens and small business, which led to an increase of the interest rates up to ten percent with the result of a decline of loans and the bankruptcy of several business including the following poverty tendencies. As a measurement of rescuing the British economic system, the British government cancelled the Gold coverage and thus the note bank could print money without considering any restraints from that time on (Popp 2013).

The development of the contemporary global national banking system based on the Federal Reserve Dollar

The contemporary Finance is characterized by a milestone development at the beginning of the 20st century. The British Pound used to be covered by gold, which implied that each citizen could convert their notes to gold at a fix rate at any time. In terms of international trade, trade deficits were equally compensated with gold to the particular trade nation. Similar to 1846, a monetary undersupply would appear in case that imports – the consumption of one country – exceed permanently exports – the production and productivity of one country, which appeared in the United Kingdom at the beginning of the 20th century. At that time the printing of money was completely unthinkable and beyond any national constitutionality, but it “had to” occur as the only solution for the allegedly monetary undersupply in the own kingdom – Great Briton.

Similar to nowadays it was beyond the societal attention at first. In the following years the First World War played an essential role as a form of distraction from the own economic disasters. However, the international British diplomacy played in terms of the emerging tensions before the First World War not a subordinate role. After the First World War the United Kingdom tried to implement in a financial conference in Genoa the British Pound as the world's dominant currency, which was denied by the majority of the participating states, because at that time the experience existed already that the states would abide by this agreement (Popp 2013).

The monetary system is in general very useful and serves the public, as it evaluates certain goods and services in order to enable unlimited "trade". The problem emerges by the implementation process, as money is actually not a mean of exchange as it is explained and communicated. According to Popp (2013) it is more likely a legal obligation to use money for predefined goods and consumption structures. Consequently, the question arises who prefixes and rules global money when *money makes the world go round*. In 1913, the first big step was made in this context by ceding the monetary system to small banker elite – the foundation of the Federal Reserve System, which is known as the central banking system of the United States with the duty and authorization to issue Federal Reserve Notes known as the U.S. Dollar. In fact, it represents the law of the Federal Reserve Act and the private property of a bankers group. The United States own neither an own currency nor a national central banking system (Popp 2013).

The development continued at the ending Second World War with the Bretton-Woods-Agreement in 1944 in New Hampshire. The Bretton Woods system created an international basis for exchanging currencies linked on the Federal Reserve Dollar (US Dollar), the International Monetary Fund (IMF) as well as the International Bank for Reconstruction and Development – the World Bank (Stephey 2008). The time in which this agreement was made, can be seen critically, because which of the major states were really independent at that time. Due to the situation of the World War major states worldwide were enemies or nations with high dependence on others such as Poland whose government was, for instance, in the exile in London at that time. The Federal Dollar was provided with a gold exchange standard on the base of 25 percent gold at the price of 35 US Dollars per ounce. This was the new world's dominant currency linked with all other national currencies on the base of fix exchange rates, which implied that all the other currencies were linked to gold via the US Dollar (Popp 2013).

The Bretton-Woods-Agreement itself would lead to a monetary undersupply in the United States, as those to the Dollar linked nations could build up reserves in times of economic booms in order to build up reserves for coping upcoming economic recessions. Consequently, in 1949 a retransfer agreement has been determined, in which the to the Dollar linked nations had to retransfer their trade surpluses back to the Federal Reserve in forms of US Dollars and got credited 25 percent gold reserves **notes** in contrast. Between 1949 and 1971 appeared gold reserves of more than three thousand tons in Germany, which were only bookkeeping transferred based on large trade surpluses between Germany and the US (Popp 2013).

The problem of this financial construct emerged between 1949 and the 1970s, because in 1944 at the time of the Bretton-Woods-Agreement, the United States used to be economically independent and exported much more goods than imported. The retransferred trade surpluses were transferred to the Federal Reserve and stayed outside of the American Economy. Somehow the amount had to get into the economic cycle of the US in order to prevent a monetary undersupply caused by continuously rising import rates. The situation in the United States got aggravated, when the Federal Reserve increased the wage level in the United States in order to spread the returned trade transfer in the state. The American population earned more in relation with their added economic value.

The consequences were that the production sites in the United States were less attractive for the organizations which consequently relocate them in more attractive nations. This aggravated the trade difference between the U.S. imports and exports and as well as the trade

surpluses booked in foreign national banks and the amount of dollars, which had to be retransferred from the FED into the American economic cycle. Consequently, there were and are no winners in this trade agreement or under the Federal Reserve Dollar as the world dominant currency, whether the United States especially not the American population nor the foreign states and national banks (Popp 2013).

The accumulation of the new structure of the world's dominant currency and it's the new ways of trade transfers arose in the later 1970s, when the partner states started to change their dollar assets into their promised 35 percent gold share. The trust into the world dominant currency decreased and the national banks worldwide began to try to change their dollar holdings into gold. The first country, which thematised this international issue, was France, as Charles de Gaulle demanded part of their credited gold reserves from the U.S. and drove up with containers of dollars (Zschäpitz 2011).

On the 15th of August 1971 the former US President Richard Nixon made the fundament for the contemporary economic and capitalistic system by removing the cold coverage of the Dollar, which solved the problem of owing the trade partners of non-available amounts of gold¹. Richard Nixon activated the emergency brake by declaring, that from that moment on the U.S. refuse to swap at any time Dollars into gold with the argument of international speculation against the United States. In fact, the original problem of the Federal Dollar world dominant currency structure of high imports into the U.S. and shrinking exports got aggravated by high expenses in the U.S. caused by the wars in Korea and Vietnam (Zschäpitz 2011). Two years after this segregation, the exchange rates to the Federal Reserve Dollar were available on the international markets and from that time on the World's Dominant Currency – the FED Dollar – converted to a note currency, which could be randomly increased under a privat hand of a bankers group, linked to the Federal Reserve Act of 1913 and the gold standard underlies market fluctuations instead of the fix rate of 35 Dollars per ounce. This had enormous multiple financial consequences for the international monetary system, because the foreign currency (forex) were not anymore bound on a fix rate and thus the era of common finance policies ended (Zschäpitz 2011). The question arises why the heads of the foreign nations worldwide did not take action after they segregated the gold standard and did not get back their assets, which got still transferred to the United States in form of exports after 1971. As high representatives and politicians, the price would have been tremendously to admire in public that their nations were betrayed for several millions. Furthermore the own currency such as the British Pound was intensively bound on the dollar and would be threatened in case the Dollar would lose its dominance (Popp 2013).

The financial consequences, caused by the decision of the former US-President Richard Nixon in 1971, might be observed in modern monetary politics not only in the United States such as in the European Central Bank (ECB). It would have been much more difficult in times of gold standards to print 22 billion Euros in order to purchase Italian and Spanish governmental bonds, as it happened in the summer 2011. Experts emphasize that Nixon created with his decision the basis for the crisis in 2008, whose impacts lasted for several years. However, the suspension of the gold standard led to a significant destabilization of the global financial system, as nations could, for instance, take extensively unimpeded debts. The debt ratio – the value of debts in contrast to the GDP – has increased in explosive dimensions within the previous four decades such as from 18 to 80 percent in Germany or from 50 to 100 percent in

¹ The U.S. transferred between 1949 and 1971 the trade surpluses to the particular national banks in form of bookings and the physical gold stayed in the United States. However, in 1971, when the foreign national banks demanded their 25 percent gold shares or at least part of it, the amount of gold reserves in the U.S. was much less than the foreign bookings. If the Bretton-Woods-Agreement would still be valid Germany would have gold assets from the U.S. of 60 thousand tons of gold instead of around three thousand in 1971, although only 25 percent of the trade surplus was credited in gold!

the United States up to 2011. In Japan, the quote increased tenfold from 20 up to over 200 percent up to 2011. It can be summarized that any economic and financial crisis was solved by activating the money printing press in extraordinary dimensions. The from the gold detached amount of money in circulation increased faster than the value of the produced goods and services, which results into enormous disequilibrium and speculative bubbles, which led into the first quite tangible international disaster in 2008 (Zschäpitz 2011).

Excursion: the establishment of an organized financial structure

The complexity of the emergence of financial sectors in Europe can be described, underlined by historical sources, as the ascription between the emergences of financial markets to the rise of large trading monopolies with close linkages to governments (Andrianova et al. 2008, p. 30 f.). Andrianova et al. (2008) argue that London as well as Amsterdam were not unique cases in terms of the important and critical role of governments in the emergence of financial systems worldwide. The establishment of (banking-) monopolies with close links to governments appear as logic consequences, because the trading monopolies were characterized by broad based ownerships with which they could mobilize savings from a wide range of investors.

However, in England in the 17th and early 18th century the leading joint-stock companies and banking monopolies in that time played a crucial role in the emergence of the financial sector, because these monopolies created and protected economic rents in foreign trade and later banking, secured financial sources for the governments or empires in that period and finally importantly, strengthened the investors' property rights. In 1695, for instance, there were 140 joint stock companies with a total market capitalization of £ 4.25 million of which 50.3 percent or £ 2.14 million was accounted for by three foreign trading companies – East India Company, RAC and Hudson's Bay. The Bank of England had at that time a 16.9 percent of total market capitalization with £ 0.72 million, which results into the fact that those four monopolies accounted for more than three quarters. Eight years later, 1703, the three largest monopolies without the Hudson's Bay accounted for over 60 percent of the doubled £ 8.5 million comprehensive stock market capitalization (Andrianova et al. 2008).

In other words, the interplay of these three aspects shaped the 'preconditions' for the emergences and development of the financial markets in the latter 17th century in England. Subsequently, the occurrence of such monopolies facilitated the emergence of banking systems worldwide (Andrianova et al. 2008).

The contemporary financial system

The unequal global economic trade ratio between the United States and their foreign partners imply no winners², because in the US is the challenge of transferring the assets from the private institution of the Federal Reserve to the national economic cycle in continuously rising magnitudes on the one hand and on the other hand the constantly increasing trade surpluses within the foreign national banks, which have no value for these states except reinvesting in Dollars into the United States. China is the example for an export leader to the US and owns numerous amounts of Federal Reserve Dollars currencies. Moreover, it is commonly known that the US is highly indebted in China. Germany as the "European export leader" records apart from China enormous trade surpluses, which is missing in Germany and thus needs to be compensated somehow by German tax payers. However, exporting organizations such as in the automobile industry in Germany are generating in their balances profits in Dollars, however,

² In this aspect, we keep the bankers group owing the Federal Reserve out of attention, because their assets are continuously growing.

which can only be used or encashed in nations with the Dollars as their official currency or used within the production nation with high inflation rates as consequences. In addition, the majority of their shareholders values are also in the United States, which enforces the unilateral shift of value from Europe to the US. As a consequence, the German tax payer is not only loosing added value to the US, but also lives much under his living ratio, as Germans are also confronted with the possibility of losing their job (through job offshoring) and thus the possibility of societal participation. This implies a shift of the labour market equilibrium and thus worsens labour conditions and wage levels, which became since more than ten years an increasingly important contemporary issue in Germany (Traunmüller, 2014). The possible magnitudes of the job offshoring are from the current point of view not even closely tangible, as, for instance, in Austria the multinational organization Voestalpine threatens to offshore its major production site in Linz to the US, which is the job-engine for the majority of the jobs in the production and supplier sector for the region (Techt 2014). According to employees of the organizations shows tendencies of the offshoring steps, because the renewal of the smelting furnace in Linz have been appointed and this infrastructure runs out in the next years.

Furthermore, German export surpluses cause inflationary effects in the German economy. To begin with, exports in general represent essential achievements and values in a modern economy, as Spain and Sweden, for instance, benefit in trade, if Spain exports olives to Sweden and receive woods in return. The problem, however, emerges when all nations struggle for export surpluses as “forms of profits” within the global structure. However, in reality export surpluses are due to that structure less desirable, because Germany exports, for instance, cars to the United States and receives in contrast foreign currencies, which lies still in the banks of Germany and is not automatically integrated in the German economic cycle. These foreign exchange reserves are usually not used to purchase tangible assets in the U.S.³, which would refer to an actual trade and thus create a financial equilibrium. In contrast, these trade surpluses get partial changed into the own currency – Euros – in order to pay the workers of the automobile construction sites. This money is spent by workers in Germany, which creates higher inflation rates, because of the missing equivalent value of the shipped products abroad and thus linked local goods and labour performances are missing within the German business cycle. In other words, Germany imports with its export surpluses its inflation additional to the aspects mentioned above, of the lost export surplus values, which imply a hidden monetary undersupply. As a consequence, in reality the phrase “We are export master”, which a commonly used by German politicians and economists to express a feigned economic success, expresses contrast effects that the Federal Reserve prints money in the US and increases inflation both in the US and in Germany in that case (Popp 2013, 36 f.) in order to prevent economic and financial crisis and disasters. However, the history proved that this global finance structure, which under the supervision of the World’s Dominant Currency the Federal Reserve Dollar, created numerous financial, civil and economic crises and is directing the world economy towards a upcoming financial crises (Neuberg 2015, Popp 2013), which is tried to get solved again by activating the money printing press (Zschäpitz 2011). However, this problem solving structure solves the economic problems only seemingly but definitely increases (national) debts, economic instability and the vulnerability for the upcoming crisis, whose magnitude of consequence is not even closely conceivable.

In addition, the mutual international monetary policy is based partly on chaotic structures and measures since the 1970s, as central banks around the globe intervened to stabilize and controlled their currency. This subject gets partial visible through the accumulated foreign currency reserves of the Federal Reserve Dollar in countries such as, Russia, Japan or China.

³ Apart from job offshoring to the U.S. by some organizations, but which is as far as the overall trade volume concerned not even mentionable, regarding the 3.2 trillion trade surpluses in China, for instance.

The People's Republic of China disposed over 3.2 trillion Dollars of foreign currency treasury in 2011, which is today significantly higher estimated, as figure 1 underlies a nearly progressive growth development, as in 2004 China "owned roughly 0.5 trillion currency reserves in Dollars and in 2008 nearly 2 trillion Dollars (Zschäpitz 2011).

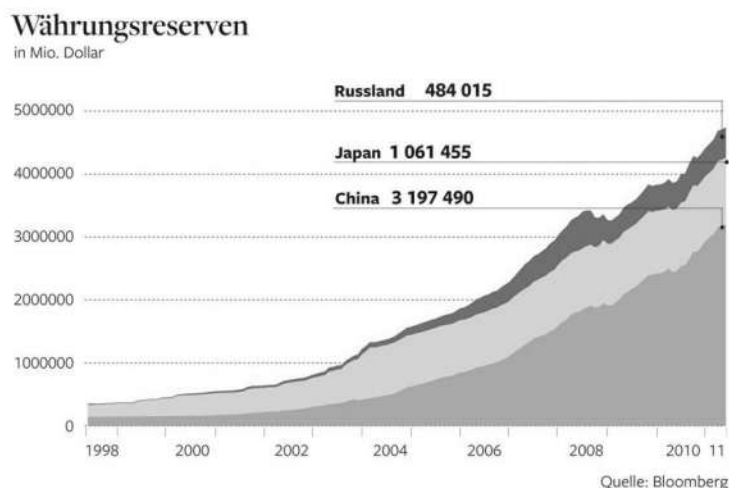


Figure 1: Currency reserves in million Dollars

Source: <http://www.welt.de/finanzen/article13546275/Vor-40-Jahren-begann-die-Aera-des-Gelddruckens.html>.

The following figure 2 "development of world's dominant currency" implies independent of the exact periods the uncertainty and instability of dominant international finance structures occasionally due to the symptom outlined above, which affect the world society in its various subsystems from finance up to ecology in multiple dimensions.

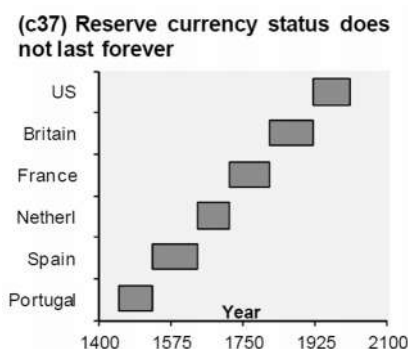


Figure 2: Stages of world's dominant currencies

Source: <http://www.economicnoise.com/2012/06/17/the-dollar-as-worlds-reserve-currency-is-not-forever/>.

The peak of wealth and returns as a possible signal for financial breakdowns

"Central banks face increasing political pressures of solving the urging societal consequences and problems" illustrates Joachim Fels, chief economist at Morgen Stanley (Zschäpitz 2011). Morgen Stanley and J.P. Morgen Chase illustrate a terrific example of how the financial system learns from previous mistakes and deep crises. These banks reactivated synthetic Collateralized Debt Obligations CDOs⁴ in 2013, although in 2010 Goldman Sachs payed millions of Dollars

⁴ Collateralized Debt Obligations are bets on the creditworthiness of organizations. The selling banks bundle with regular CDOs corporate bonds and sell them. The difference to synthetic CDOs is the disposal of insurance-type derivatives on these bonds instead of these bonds. Similar to the CDOs of the pre-crisis 2008 vary the new synthetic CDOs with a range of interest rates and corresponding risk rates (Burne 2013).

penalty to the Exchange supervisory authority SEC 550 due to the fraud of investors, as well as it is well known that CDOs played a leading role in the emergence of the financial crisis in 2008, as only in 2007 634 billion Dollars of synthetic CDOs were sold. During the crisis in 2008, CDOs on toxic mortgage bonds caused high losses, which shocked the global financial system. Due to the enormous consequences of such financial constructions, the politics as well as investors got in the pillory with the consequences of reversing these financial products, which held only a couple of years. The reasons for re-implementing of CDOs are too low interest rates of standard financial products and the resulting search for more attractive alternatives by hungry investors, who get attracted by the well-known synthetic CDOs (Burne 2013).

The re-invention of synthetic CDOs is only one of numerous indicators for an unbundled financial system, which “collaborates” with politics only as far as the consequences, caused by the societal subsystem economy and financial sector are concerned, - the compensation, the mitigation and the removal of financial, economic and social consequences, underlined by the shift of such duties to politics and public institutions (Neuberg 2015, Michaelis 2011, Popp 2013, and Willke 2003). According to Willke (2003) neoliberal proponents blame the nation-states and governments for the economic crises of the 1970s and 1980s, which were characterized by hyperinflation rates, mass-unemployment and stagflation, because governmental interventions in economic and financial issues misled their intentions such as increasing employment rates or lower inflation rates and instead led to aggravated unemployment rates and economic recessions. As a consequence, neoliberal proponents emphasize that nation-states should focus on their truly competences as well as the importance of regulative governments instead of causing misdirecting interventions and government failures. Milton Friedman declares the state as kind of referees whose duty is to guarantee for legal order, the protection of property rights and freedom of contracting as well as to encourage competition markets. Modern politics mitigates respectively govern the relation between society and its subsystem the market respectively the economy as well as minimize and compensate societal consequences, tensions and costs of the independent market-autonomy. Neoliberal proponents heavily emphasize the role of “the market” in concerns of economic growth, for the emergence of new jobs as well as in terms of stabilizing the economy such as through the containment of inflation. It has to be the duty of the market to create economic and financial structures, in which (its) free economic subjects are able to achieve independently their objects (Willke 2003, 84 f.).

Michaelis (2011) refers to the omission of a more comprehensive regulation of financial markets and defines it as a pivotal-systemic failure. The background refers to the purpose of profits maximization on the behalf of shareholder at the costs of nation-states and taxpayers. Deregulated financial markets are substantially more convenient than regulated forms, as market player had to admit highly risky financial products in order to cope of the *greed for profit* according to the general shareholder value-estimation⁵. This is a main aspect for the refusal of Basel II. However, the regulation and the supervision of the unbounded financial sectors, which are basically a subsystem of the overall society and thus should serve society in its entirety and not only a tiny percentage on the costs of the entirety, basically conduces the protection of its investors and the prevention of potential systematic risks, which may lead to damages in the real economy and subsequently in the overall society. Especially in a continuously connecting and linking world, obtains the protection of financial markets an

⁵ The issue of the shareholder value-estimation relies on the behalf of the maximization of the surplus revenues. Shareholders are highly interested in constituting the financial assets in the enterprise’s balance sheets in market-realistic aspects, because their annual dividend relies on the increased enterprise value with the basis of subjectivity, which is tried to be objectivized through organizational key figures and further higher comparability through different sets of assessment approaches (Michaelis 2011, 45 f.).

increasing significance, which existed within the (former) EU already in 1957 and 1979 with “Cassis-de-Dijon” in contrast to the United States, where only after the crisis in 1929 some general conditions were merely mentioned (Michaelis 2011, 15 f.).

Neuberg (2015) refers with his term *financial feudalism* to similarities between the contemporary financial hegemonial structure and the (former) feudalism, which has been characterized by a network of political empowered through the allocation of fiefdoms by the territorial lord and thus warlord. The autocratic usage of territories especially with bondmen guaranteed the accumulation of wealth beyond generations, which implies that money and wealth have been for ages a driven forth to obtain a live in luxury and in further steps to consider military actions to enlarge wealth and reputation. According to Neuberg (2015, 163 f.) the crucial connecting aspect between history and the contemporary structures of modern society is that wealth is steadily accumulated in few hands in combination with the increasing gap between poor and rich until the capacities are exhausted and the majority suffers by starvation as the last symptom of poverty and consequently opposes as in 1789. In this respect, the more unrestricted power structures are the faster cumulates the wealth of few and aggravates the poverty of majorities. The similarities between the former and financial feudalism are according to Neuberg (2015) remarkable:

- A modest savage of capital aggrandises itself endless through reasonable investments and later on it gets transferred between generations. However, also in industrialized countries shaped by advanced forms of democracy cumulate enormous wealth in the hands of a tiny percentage and the gap between poor and rich increases in vast dimensions worldwide.
- The extrapolation of recent global developments and projections of the previous 20 years imply not only to a growing poverty gap, but also both old-age poverty and the increasing gap between industrialized nations and emerging nations.
- Outside of the industrialized economies establishes a pure capitalistic culture, characterized by ruthlessness and hardly a suspension in fractional periods than in the west.
- The capital usage and investments do not apparently determine wars and crises. However, superior political processes get shaped by them through capital movements, via political influences, the power of communication media or might it be direct or implicit via networking.
- Higher unemployment rates imply a greater dependence of employees especially their wage levels and thus in further steps their existence and societal participation. Within the emerging and third world countries in particular is still a similar ethical-social development such as in Europe not even closely foreseeable (Neuberg 2015).

The era of enlightenment initiated and led to a transformation from feudal nobility structures to democratic societal achievements. However, previously enormous capitalistic accumulation processes induce a development of societal achievements back to a centralization of (monetary) power, which enhances a two-class society, similar to former concerns of social experts such as Karl Marx centuries ago. The structure of this relentless circulatory development of initiating economic recessions followed by heavy crises, wars or revolutions which leave the need for an economic recovery behind, are apparently hardly preventable and get steadily newly mixed with increasing tendencies and thus more and more unpredictable dimensions of its impacts. Within this circulation extrinsic and intrinsic power structures regenerate themselves in new dimensions, societal wealth gets annihilated and new (more) powerful players establish themselves as key societal influencing factors. Serious contemporary societal predictions point

out the fact of the almost impossible closure of the gaping wealth distribution in democratic or peaceful dimensions (Neuberg 2015, 160 f.).

Wealth is for the tiny wealthy social class a naturalness, which shapes and forms personal behaviour and philosophies. Although a certain understanding within the rich about the consequences mainly of the broad mass caused by their wealth accumulation exists, a levelling of wealth is definitely excluded despite of numerous intensive experiences (of the past) such as revolutions in the previous centuries and the incessantly appearance of economic and societal fundamental crises since the middle 19th century. Monetary and financial structures enable, despite their importance and improvements, the decoupling between labour, knowledge, innovation, organisation and capital investment with monetary added value. Inherited wealth is in fact a retained and accumulated monetary performance, because it includes an inherited status and behavioural structures and thus influences the economic ethics by interfering to equal opportunities through given privileges or origins and thus implies a re-development to monetary (feudal) nobility structures (Neuberg 2015).

The question arises whether history repeats in different manner, as elite secures privileges and separation through networks and monetary privileges – an intrinsic influence on politics. It seems as to find within this societal system, which shapes modern society, solutions through a more sophisticated education system, which is due to several factors not realistic and results in a collective suppression. Since the initiative periods of the capitalistic hegemonial system rules the pressure of performance enhanced later on by the pressure of competition, whose success is confirmed through the contemporary excellent luxury living standards at least for a tiny global minority, which implies already a paradox phenomenon (Neuberg 2015, 163 f.).

Contemporary global structures imply the difficulty that such developments and societal principles exceed the borders of closed economies and nation-states, which represent exploited instruments (Michalitsch 2006; Willke 2003; Stiglitz 2013). However, even in case that nation-states obtain infrastructure, logistic and transportation, and ensure energy and natural resources, the greed (personal ego) for wealth and market accumulation is the driving factor (Neuberg 2015, 165 f.).

Regarding the facts above, it is obviously that the global society is not running out of monetary resources as it commonly discussed in public. However digital monetary value gets continuously extraordinary manners created in the modern economy, less by the printing presses of the Bank of England for instance, but by bank lending procedures by commercial banks themselves. Banks create money whenever they lend to someone in the economy or purchase assets from their consumers. Moreover, in contrast to public statements occasionally in scientific textbooks, the Bank of England for instance does not directly supervise the quantity of either base or broad money⁶ (McLeay et al. 2014).

It is not about, that our global society runs out of money or monetary power, it is about that the shift of the money from the majority to the tiny monetary elite, which is called in diverse societal groups as the money aristocracy (Stiglitz 2013). The United States as the capitalistic driving nation is, for instance, also an extraordinary example of the gaping wealth development resulting in intangible magnitudes of societal gaps. The US population used to be divided in wealth terms into a one third and a two third and further into an 80 percent versus 20 percent in the second half of the 20th century. Meanwhile experts (Stiglitz 2013) refer to the extreme magnitude of the *one versus 99 percent society*. In 2007, the US top percentage earned on average \$ 1.3 million in contrast to the bottom 20 percent with an average annual income of \$ 17,800. The top percentage earned around 40 percent per week than the lowest fifth a year as

⁶ The Bank of England is, however, able to influence the amount of money in the economy by setting monetary policy through the interest rate that it pays on reserve held by commercial banks with the Bank of England in normal times (McLeay et al. 2014).

well as the top 0.1 percentage obtained the same monetary added value per one and a half days than the bottom 90 percent together per year.

Even shortly after the financial crisis of 2008 the disparity grew in advanced dimensions, as between 2009 and 2010, 93 percent of the additional monetary value flew to the top percentage in the US. The income rates of the broad mass remained either equally or even dropped continuously within the previous decades. During the crisis of 2008, top-managers defended their wages remarkably well and additionally received bonuses for releasing parts of their work force in order to maximize profits and scoping demand challenges by reducing personnel expenditures. Around 57 percent of capital incomes shift to the top one percentage of wage earners in the US (Stiglitz 2013, 25 f.). The gaping wealth distribution and societal gap is even more tangible in terms of wealth and ownership: in the US the one percentage owned *more than one third of the entire gross national wealth* including nation-state values such as airports in 2007. Even after the stock crash the top percentage owned 225 times more than the average US citizen. Similar to the period before the economic crisis in the 1930s, the current exorbitant magnitude of the societal inequality leads to threatening economic and societal instabilities (Stiglitz 2013, 26 f.; Trautmüller 2014).

Austria is the third richest country of the EU and is evaluated as the 7th respectively 12th richest country worldwide. Nevertheless, the rich nation-state and its population face alarming dimensions of income and wealth gaps. The bottom tenth earned less than € 11,630 per year compared to at least € 39,379 of the top tenth of society. The top five percentages of households possess nearly half of the entire gross national wealth, whereas the bottom half of society does not even have four percent at its disposal. The bottom half disposes on average over € 11,000 compared to the top five percentages with a median net wealth of € 1.7 million (Fabris 2014; Trautmüller 2014).

Inflation as a redistribution tool from the bottom to the top of society

The inflation was in June 2014 at 1.9 percent which is 0.4 higher than in February 2014 in Austria (WKO 2014). The inflation is based on the consumers' price index, which covers collectively regarded the most important goods and services within one society. Contortions of this key figure appear in terms of the chosen goods especially for deprived or poor households, because they do not purchase or afford each year technological luxury devices such as flat screens or smart phones as well as long haul flights. These luxury goods and services are mostly characterized by decreasing price developments and thus the inflation rate for poor and deprived individuals is significantly higher and which refers more likely to the micro or mini-consumers' price index – 3.5 percent in April 2014 instead of 1.7 percent of the regular price index (Janek-Zenker 2014). The reality of the currency devaluation is only partly tangible by the annual values, because the accumulation of these rates is of importance – only between 2010 and 2013 the mini-consumers' price index increased by 12.3 percent in Austria (Höller 2013).

In reality, inflation correlates with price increases of consumption goods and services as a result of “demonetisation”, while the wages of the broad mass remain equally. In that case redistribution from the bottom to the top of society respectively from poor to rich takes place (Jilch 2012), because shareholders generate more wealth at the costs of the broad mass, whose real income decreases. However, governments in the EU but also members of critical organizations still define the inflationary politic as the cure and social fair. The paradox of this statement might be more obviously regarding the hyperinflation in the Weimar Republic, which nearly destroyed all savings. In addition, inflation gets aggravated by hidden mechanisms, as due to competition and market sensibilities some organisations cannot increase their prices. Consequently, since 2009, when the EU abolished standard sizes, organizations refer to additional tricks such as adopting packaging sizes or packing less quantity in the same size.

Analyses refer to up to 50 percent less content within the same packing, while customers recognizes such differences only at closer looks (Jilch 2012).

The realignment of social values – financialization of society

The enormous shift of monetary power out of the, for instance, towards the rich percentage also called as the monetary nobility implies monetary undersupply in society and subsystems such as the financial and economic sectors. To begin with, as prior crises showed, the combination of monetary undersupplies and the resulting overvalue of economic values such as properties in 2008 and enhanced by their speculation leads to aggravated economic and financial conjunctures with increasing unpredictable magnitudes enhanced by the accumulation of crises, which will be later discussed in this paper. The recently famous crisis of 2008 serves as a precursor for possible financial and as a second step economic and further entire society crises in the near future. Contemporary global economic stagnant developments – the lack of new striking growth opportunities, as we had it in the past with the fall of the communism, technologization, arisen emerging markets or new societal patterns such as single-households – enhances an increased pressure to generate growth of economic figures and profits within the closed system. The resulting monetary increase through monetary creation leads to totally over evaluated financial structures and steadily less ethical methods of continuing the constraint of continuing this financial dominated economic system (Willke 2003).

The question arises whether recent incidents such as of Volkswagen are only single outgrowths, because Volkswagen got coughed by an honest efficient system or is only one of numerous organizations, which adapts its strategies to the high demands of its shareholders. Proissl (2015) emphasizes factors of an upcoming global recession. The question arises about the financing of the financial trade in form of stocks such as experienced by Volkswagen. However, in recent years in periods of hardly noticeable economic recovery the shift of the money in extraordinary dimensions away from major parts of society implies the pressure of financialization of society. Societal subsystems and groups such as pensioners in Greece need to compensate this monetary shift by a cut of 70 percent of their pensions, for instance.

The societal pressure of financialization

Regardless of the definition and the theoretic analyses of financialization the data presented in this paper and elsewhere minimize the doubt about the key role of financialization in business and societal affairs in recent decades. Epstein (2005) emphasized ten years ago the increase of the daily volume of foreign exchange transactions from 570 billion U.S. Dollars in 1989 to more than 1.9 trillion each day in 2004.

The financialization of western economies and major parts of their societies, describes Young (2013) as more than the increasing importance of the institutional structure of global financial markets such as investments and pension funds, the increased attractiveness of investments as well as a hermetically financial system characterized by logic, mathematical and abstract patterns of thinking. Furthermore, the increased attractiveness of investments leans back to a wide range of new ways of partly miraculous multiplication of money. Langley (2008) and Young (2013) refer with the increasing pressure of the “*financialization of everyday life*” to the automatization of a financial capitalism, which gets in terms of politics and international political economy associated with neoliberalism, which refers to the societal domination of (financial) markets over the real economy in the contemporary form of capitalism (Young 2013, p. 65 f.) – according to Duménil and Lévy (2005, p. 17) neoliberalism is the ideological expression of the reasserted financial power. Thus, the boundless financial system is the subject within the integrative perspectives of globalization as well as of financialization (Young 2013).

Finance respectively financialization overtakes continuously more very essential roles in modern society (or at least for a manageable number of its members). According to an analysis of Kedrosky and Stangler (2011) the share of the financial sector increased as a percentage of the U.S. GDP between 1850 and 2009 from slightly below one percent to over eight percent. Epstein (2005) emphasizes that finance defined and re-established societal norms guaranteeing its supremacy, which refers to one facet of neoliberal strategies, the establishment of new social orders. The finance sector set up strategies with the target to control any social force that would be able to impede its progress such as through public deficits, which were used to impair the dynamics of welfare expenses or debt crises and financial crises allowed the spread of the neoliberal model. Furthermore, finance increased possible incomes tremendously by simultaneously using the traditional channel of income made by production, the channel of taxation as well as interest payments. The profiteers of financialization process which support it are

1. **Households:** A fraction of households holds significant parts of the societal monetary and financial assets;
2. **Stock market indices:** Indexes of different countries such as the USA, Germany, France or the UK move strikingly in tandem;
3. **The profit rates of financial corporations:** The effect on profits on achieving increasing gains is higher than the growth of the net value of organizations because of rising financial values (Epstein 2005, p. 37 f.).

Financialization progresses significantly enhance the polarization of society's wealth and income distribution. Regarding John Paulson's annual income of roughly four billion in one year compared to the average American income of 17,800 U.S. Dollars in 2007.

Pension funds as one example of financialization structures

In combination with the continuous replace of full-time standard employment by atypical employment welfare-oriented pension systems additionally struggle with decreasing pension contributions and thus face fundamental financial issues. The report of the Credit Suisse (Neff et al. 2012, 10 f.) refers to the complex financial challenges of pension funds. The Pension Funds Survey conducted for Credit Suisse emphasizes the challenges of financing pension funds in a long-term low-interest environment which 43 percent of the sample agreed with, followed by the European debt crisis with 15 percent agreement, high minimum conversion rates with eleven percent, demographic trends with nine percent, too high minimum interest rates with eight percent and finally increasing administrative costs with seven percent. These results imply a significant alignment of pension funds on financial markets. The same report presents that the Austrian pension funds hold roughly seven percent of their assets in liquid assets in contrast to around 30 percent stocks, to roughly 45 percent bonds and ten percent other assets (Neff et al. 2012, 10 f.). The pension fund system, which is designed for coping social needs of the (labor) society, drifted into risky financial markets partly in order to finance the contemporary structures. The possible consequences of this form of alignment are high, because in case of financial crises, for instance, incurred high capital losses for societies, the possible extent of which is not even remotely tangible yet (Trautmüller 2014).

The beginning symptoms of a monetary undersupply in modern society – consequences of the lack of assets in foreign national economies focused on Germany and Austria

The FED received export surpluses in form of US Dollars from the US trading partners including Germany and Austria, which had to enter the US-economy, as previously in this paper discussed. In this context, the wage level increased significantly in the US with the

consequences of offshoring of labour power, because of the significantly decreasing attractiveness of the US as a production site. The global completion of production sites was born. Popp (2013) refers to offshoring through increased wage standards initiated in the US and followed in Europe and finally within emerging countries in order to seek steadily cheaper production but also services values on the globe, which has currently achieved its maximum magnitude with the exploitation of the developing countries on the known example of China and India.

Furthermore, offshoring⁷ has multiple effects on nation-economies including growing unemployment rates, higher economic instabilities, worse working conditions and increasing poverty rates. However, the loss of jobs within one economy through offshoring enhances the bargaining power shift from the employees towards employers through additional losses of workplaces in industrialized nation-economies (Levine 2012). According to Levine (2012), the US Bureau of Labour Statistics' (BLS) provides the only data on jobs which were lost because of out-of-country relocations⁸ and refers to around 30 million jobs, which were offshorable in the US in 2007 – jobs, which contain attributes that would allow them to be replaced overseas, for example no in-person customer service required, IT-enabled work processes that can be accomplished via telecommunication; and jobs that can be routinized (Levine 2012).

A study of the Austrian Press Agency (APA) about the relocation of multinational organizations out of Austria refers to 70,000 job losses between 2008 and 2012 which led to tax losses of 1.26 billion Euros, due to the relocation of entire organizations (Wirtschaftsblatt 2013). The recent case of the multinational organization the Voestalpine in Linz, which threatens the Austrian government to relocate with its approximately 46,000 employees to the US, emphasizes the actuality and current threat of this subject matter (Techt 2014). The entire scope of the outsourcing development within western economies can only be partly quantified occasionally in new employment developments such as intensively of subcontracted or temporary labour (Bosch 2012, p. 14 f.; Traunmüller 2014).

The contemporary labour market pressures and their resulting possibilities of labour-exploitation

Brinkmann et al. (2006) refer to the labour market as a core economic institution in terms of economic dynamics, significantly encouraged through deregulation, flexibilization and casualization of labor markets. Financial markets obtain central economic significances in terms of the determination of investment alignments, for instance. The tensions between the economy as a subsystem and its overall system the society need to get mitigated apart from the nation-states by adopted labour market structures – whose working conditions serve as grease for the economic and financial excesses. Thus flexible and cheap labour developed shift from the consequence of the contemporary capitalism to the precondition of its existence (Brinkmann et al. 2006) and enhance the capital shift towards the elite.

However, legal difficulties occur in welfare states such as Austria and Germany through the legal labour market structures. Consequently, *atypical employment* is the modern cure for

⁷ The term offshoring describes the relocation of work processes mainly within multinational organizations located in the United States or Western Europe beyond national borders that usually could have been made by in-house employees, for instance, computer programmers, systems designer or operators in call centres. The phenomenon of offshoring – also known as job migration – initially began to boom during the 1970s and 1980s, as multinational western organizations opened facilities abroad (Levine 2012). However, this process appeared earlier, as Germany, for instance, lost over 400,000 jobs between 1955 and 1980 in the textile industry (Braun 2003, 9 f.; Traunmüller 2014).

⁸ Since 2004, BLS analyzed enterprises with at least 50 employees and that sent minimum of 50 workers in layoffs with the duration of more than 31 days, but without to consider whether the laid-off workers' jobs left the national borders.

economic success as well as economic crisis and has become meanwhile a common phenomenon. A wide range of atypical respectively non-standard job arrangements emerged, which are partly hard to differentiate. Similar to precarious job arrangements, atypical forms of employment distinguish themselves from standard employment with the difference that lacks the analyses whether the job arrangement secures ones' livelihood or not. In this context, standard employment refers to full-time job arrangement, which fulfils the particular collective expectations (Wagner 2013; Traunmüller 2014).

Precarious and low-wage labour arrangements mainly occur in atypical employment. Eichhorst et al. (2010) defines the differences from standard employment in terms of often missing dismissal protections, partly labour efforts delinked from common social security protections and job relations with monthly or hourly (very) low income rates down to less than one Euro (Stegemann 2009). The majority of atypical or non-standard forms of employment contain potentials for precarity. Especially legal precarity is connected to almost any non-standard form of employment (Brinkmann et al. 2006, p. 19). Table 1 illustrates the development of the labour force in general and the atypical forms of labour in Austria.

Table 1: Increase of atypical employment in Austria

Period	Form of employment	Growth	Growth Rate	Percentage of the work force in 2012	Data in 2012
2000 – 2012	Austrian Labor force	+ 498,000	+ 13.5 %	100	4,184,000
2000 – 2012	Full-time employment	+ 28,000	– 0.9 %	68.8	3,052,000
2000 – 2012	Fully-employed women	– 16,800	+ 1.5 %	25.6	1,071,300
2000 – 2012	Fully-employed men	+ 44,800	+ 2.2 %	48.7	2,038,700
2000 – 2012	Atypical employment	+ 470,100	+ 77.9	25.7	1,073,800
2012 – 2013	Austrian Labor force	– 8,600	– 0.2 %	99.8	4,175,200
2012 – 2013	Full-time employment	– 45,000	– 1.5 %	73.3	3,064,900
2012 – 2013	Atypical employment	+ 36,500	+ 3.4 %	26.5	1,110,300

Source: Wagner 2013

Atypical employment characterizes the need of organizations to cope high demands of their shareholders of profit maximization and is consequently a multiplier for the monetary shift from the bottom to the top of society and thus aggravates significantly the gaping wealth distribution. There are numerous legal constructs to circumvent legal labour policies such as temporary employment, (fictitious) self-employment, subcontracted employment, fixed employment or marginal employment.

The table 1 refers to the vast increasing tendency of temporary employment in Austria.

Table 2: Temporary employment in Austria

Year	Temporary employed	Index
2000	30,000	100
2008	68,000	227

Year	Temporary employed	Index
2009	57,000	190
2010	78,414	261

Source: Wagner 2013

Temporary labour, as one of the most frequently used atypical employment in the low-wage sector is characterized by significantly lower employment stabilities than of those in standard employments, because employment agencies tend to “hire and fire” faster (Sommer 2010, 40). In the temporary labor market sector half of all employment arrangements last a maximum of 89 days. Temporary employment was born as a bridging function for temporary personnel shortages within organizations. However, this form of employment witnesses functional changes as organizations use their contract workers in 80 percent of the cases in the long term as part of their main workforce. Consequently, temporary employment functions less likely as a bridge to regular standard employment, but more likely it is the beginning of temporary employment careers (Bosch 2012, 18 f.).

Temporary employment agencies pass the risk of financing periods in which their personnel is not being leased out on to their employees and thus contract workers face a four times greater risk of being unemployed than the regular labor force (Bosch 2012, 20). Moreover, subcontracted labour forces are confronted with significant lower wage levels compared to standard employment. Within the previous years the commitment of collective bargaining agreements increased in the temporary employment sector, however, investigations prove that the starting salaries in the temporary sector are in the low-wage sector and that the wage is nearly below the half of the entire average labour market income (Sommer 2010, 40 f.). In 2010, the average monthly income of the German labour market was, for instance, 2,702 Euro compared to 1,419 Euro within the temporary sector (Bosch 2012, 20 f.). Furthermore, Bosch (2012) refers to studies that prove higher psychological disorders and enduring stress situations within the temporary sectors, occasionally due to dissatisfactions about low wages and consistent job uncertainties (Traunmüller 2014).

Another commonly used new form of labour with precarious conditions is *fixed-term employment*. The statistic Austria captured fixed-term employed initially in 2004. Between 2005 and 2012, the number of fixed-term employees increased continuously by 29,000 individuals each year up to 333,700 (Wagner 2013). In 2003, 6.6 percent of the Austrian labor force worked in fixed-term employment compared to the overall average of the EU of 12.8 percent (Brinkmann et al. 2006, 25 f.).

Fixed-term employment is often used for job starters, but the transition into regular forms of employment after fixed-term job arrangements is relatively low – only one fourth, because of flexibility aspects for the employers (Bosch 2012, 25). In general, fixed-term employment undermines the negotiation position of the labor force with consequences of comparatively unsecure job careers as well as lower income opportunities and poorer working conditions. Brinkmann et al. (2006, 26 f.) emphasize linkages between fixed-term employments and increased risks of health and security. Finally, up to present days numerous labor unions take subordinate attention to fixed-term employees and in general these employees are significant less organized (Brinkmann et al. 2006, 27).

Finally, the most common way to circumvent legal labour structures are single-self-employed, who work depend and are bound by instructions, instead of avoid permanent direct employments (Bosch 2012, 25). The Austrian labor force rate of self-employed increased between 2001 and 2008 from 2.7 to 4.3 percent (Eichhorst et al. 2010). According to Statistik Austria (2014b) 476.900 self-employed individuals was the annual average of 2013 which

represents 8.8 percent⁹ of the labor force. Furthermore, the amount of freelancers – self-employed without business licenses – increased from 23,184 in 2000 to 44,191 in 2012 (Wagner 2013). In 2013, 25,408,700 self-employed worked in the EU (15) which represents 13.2 percent¹⁰ of the entire labour force (Traunmüller 2014).

The share of contracts to produce a work, which are also known as sham contracts or as fictitious self-employed working arrangements, is compared to other depend atypical forms of employment only very difficult to quantify (Wagner 2013), because it is hard to distinguish from real contracts between two independent business partners. Numerous case studies and industry surveys prove an increase of the abusive use of contracts to produce a work, with advanced examples in the meat industry, where the line work is divided in self-employed activities, or how the construction industry circumvent minimum-wages with through complex subcontractor structures (Bosch 2012).

Apart from the misuse of fictitious self-employment the characteristics of self-employment is very often misunderstood by the affected individuals due to the high tax duties, for instance, and thus might easily lead to traps of poverty. Eichhorst et al. (2010, 27) refer to a study in which one fifth of the respondents underestimated the costs of social coverage. This leads to certain information deficits and current need for consultation (Traunmüller 2014).

The Crisis of gainful employment is highly linked to unemployment

The crisis of (gainful) employment, which is occasionally visible in terms of jobless growth, precarious employment, atypical and low-wage employment and increasingly high unemployment rates and caused by the globalized competition of economies, leads to the inherent necessity of the adoption of humans and labor market structures to the globalized competition of undercutting through flexibilization, cost cutting and social downsizing. The deregulation of the labor market – the erosion of collective bargaining law, dismissal protection, maternity protection, et cetera – and the reduction of labor costs – wage-dumping, establishment of the low-wage sector and Mini-jobs, informalization and flexibilization – implies the end of standard employments, of the fully-employed white male bread winner in the western industrialized nations in the middle run, which characterized the labor market in the Keynesian Welfare state oriented form of capitalism (Wichterich 2011; Traunmüller).

The contemporary global politic-economic structure shapes the labor market demand for the disadvantage of the employees and for the advantage of the employers – mainly of multinational organizations, which means that employees accept precarious or working-poor labour arrangements against their will more easily, because in some cases unemployment represents the only alternative (Traunmüller 2014).

Unemployment represents the consequences of the contemporary shift of the labour market equilibrium – the encounter of decreasing labour supply versus an increasing labour demand. In June 2014, 281,555 employees were unemployed out of the 3,528,000 comprehensive dependent Austrian labor forces which grew by 19,000 respectively 0.5 percent compared to the previous year. The unemployment rate grew between 2013 and 2014 by 16.2 percent or 39,324 individuals. The increase of the unemployment rate was comparatively high in Vienna with 17,487 individuals or 21.3 percent, followed by Upper Austria with 5,508 additional unemployed individuals or 20.8 percent. The growth of the unemployment rate between June 2013 and June 2014 was heavily concentrated to the service sector (tourism excluded) with additional 29,361 unemployed (15.6 percent) to 217,764 registered unemployed (Putz 2014). The estimated national unemployment rate was in June 2014 around 7.4 percent compared to Eurostat unemployment rate of Austria of 4.7 percent based on data of surveys including seasonally adjusted figures in Mai 2014. 31,914 additional versus 35,025 less vacant jobs lead

⁹ The numbers are excluding the self-employed of the agriculture which would increase the rate to 11.4 percent.

¹⁰ Excluding the self-employed of agriculture.

to 28,987 registered available jobs. Finally, the number of occupational training participants grew by 908 (1.5 percent) to 73,073 individuals in June 2014 (Putz 2014). It is significantly difficult to find jobs for elderly people and even worse for disabled individuals with low qualifications whose unemployment rate refers to 47 percent (Traunmüller 2014).

Furthermore, underemployment or part-time unemployment is not captured by mainstream data concerning unemployment (Ek and Holmlund 2014). Part-time unemployment refers to any people who work in part-time or atypical job arrangement involuntarily in the sense that these workers prefer to work longer hours at prevailing hourly wage rates. The rate of the part-time underemployed corresponds currently to roughly 7.7 percent of the entire Austrian workforce – is equal to 340,000 individuals (Schweighofer 2013). In general, there is a visible current tendency of an increasing unemployment development. Even though, the Austrian economy was recently characterized by a slight upturn and economic recovery, the unemployment development was characterized by a different development (Traunmüller 2014).

The division of society – decoupling and de-collectivization

Castel (2011) emphasizes that modern western labour societies struggle with the erosion of the two main collective social security fundaments– the *nation-state* and the *homogeneous socio-professional groups*. The homogeneity of occupational groups and of its collective regulating instances is hollowed out with the result of mass-unemployment and increasing informal employment as well as increasing atypical employment. The occupational objectives of two equal employees may differ over night, in case of one loses his job whereas the other keeps it. Consequently, solidarity is replaced by competition between equal employees and working groups. Instead of focusing on collective targets and interests within groups of equal employees, individuals are forced to emphasize their differences in order to secure their working and living conditions (Castell 2011).

A flexible and individualized labour management replaces collective organizational managements based on stable employment. The modernized capitalism conducts an overall flexibilization of employment arrangements and structures, occupational careers and social security systems, which are in each case heavily connected to the employment status. Such dynamics induce de-collectivization, further individualization as well as cutbacks in social security benefits. The de-standardization of gainful employment or the individualization of work process are characterized by the transmission of entrepreneurial responsibility and costs to the employees who partial run entire production steps autonomously and need to overtake responsibilities of product qualities (Castell 2011). Increasingly major parts of employees move into permanent crisis of gainful work or securing one's livelihood, because of the advanced magnitude of the transfer of costs and risks, for instance, when chambermaids are only paid by the made rooms or waitresses need to rent the tables in restaurants (Wichterich 2011; Traunmüller 2014).

In addition, this transfer of entrepreneurial risks and costs to employees gets aggravated by the structure of personal companies "*I incorporated*", as they take over responsibility of increasing occupational decisions, timely re-educations measures and occupation self-responsible behavior in order to maintain on the active labour market. This increases the vulnerability of employees for further pressures of labour flexibilization. According to Castel (2011), it should be more focused on the ambivalence of individualization and de-collectivization processes, which manifests itself in diverse forms of various configurations of labour organizations and affects in different extensions nearly all employees' groups beginning from trainees up to start-up entrepreneurs. Individualization refers to the condemnation of freedom and the release from unpleasant collective constraints, which are in different dimension enhanced such as aggravated competitions and the constant threat of unemployment or descent career developments (Castel 2011; Traunmüller 2014).

The desperation about the missing future perspectives is conceived in different ways between individuals, but reactions are also characterized by collective natures including resentments, which is the reaction of individuals belonging to groups towards the end of the social ladder and find themselves in competition with members of other likewise deprived groups. The resulting shrinking solidarity within socially equals in combination with aggravated tensions between social groups decreases living qualities – more unpleasant aspects including higher rates of unemployment or marginal forms of employment; dilapidated residential environments with air-, water- or noise pollutions; soulless urban constructions; divers ethnical groups living closely beside each other; higher crime rates; uncivilized behavior in everyday life; and tensions, conflicts as well as disturbances with security guardians. In this context, social and civil uncertainties meet and reinforce each other reciprocally (Castel 2011; Traunmüller 2014).

The invisible ghost of poverty

The monetary undersupply in western societies in combination with first symptoms of welfare states or labour market structures such as atypical forms of employment or unemployment refer to decreasing living standards through a monetary undersupply in the households. Apart from increasing expenses more and more individuals struggle with the accumulation of crises or multiple crises – including economic crises, ecological damages, illnesses, cutbacks of social benefits in terms of neoliberal adaptations of the welfare states or climate change, which lead to complex emergency situations for vulnerable households and individuals. In the previous years, the climate change led more frequently to tempests such as floods and the annual raining and dry periods are not any more reliable which might cause high crop failures especially noticeable for small farmers (Wichterich 2011).

The rate of financial deprivation increased from 13.7 percent in 2004 to 16.4 percent in 2010 in Austria. Contortions of the data may occur due to the definition of basic needs, because goods and services such as holidays, cars, telephone, television or washing machine are, for instance, not defined as basic needs according to the national Austrian definition. According to Fabris (2014), 14 percent of the Austrian population faced deprivation in 2013, whereas 22 percent – 1,852,000 individuals – cannot afford to cope, for instance, unexpected expenses. Significant deprivation describes circumstances of households, which cannot afford four out of the seven basic needs, which faced 355,000 individuals or four percent of the Austrian population (Fabris 2014; Traunmüller 2014).

Although Austria is evaluated as the 7th or 12th richest country worldwide measured by the GDP per capita (Till-Tentschert 2012) faces the apparently invincible situation of poverty or social exclusion within the previous decade between 13.2 and 18.5 percent which equals to roughly 1.2 to 1.5 million individuals (Fabris 2014; Statistik Austria 2014a). The risk of poverty or social exclusion rate decreased from 17.7 percent – 1,431,000 individuals – in 2004 to 16.7 percent – 1,376,000 individuals – in 2007 followed by an increase to 19.7 percent – 1,627,000 – in 2008. Since then the rate was until 2012 constantly above 18 percent (18.3 percent in 2009, 18.2 percent in 2010, 19.2 percent in 2011 and 18.5 percent in 2012) (Statistik Austria 2014a). 1,201,000 individuals lived in Austria under the risk of poverty or social exclusion in 2012 (Fabris 2014). According to Springer (2013) new data show that the actual risk of poverty or social exclusion rate is significantly higher as instead of 1.2 million individuals and it has been corrected to nearly 1.5 million individuals, because of adopted measurement methods of the SILC-survey of 2012, which includes firstly administrative data about unemployment benefits or family benefits. The number of individuals living under the risk of poverty or social exclusion is higher than previously measured – in 2011 the number is, for instance, 1.6 million instead of original 1.4 million (Springer 2013). One fourth of the individuals who live under the risk of

poverty or social exclusion are children and youth up to 19 years – 304,000 children and youth live under the risk of poverty in Austria (Fabris 2014; Traunmüller 2014).

Atypical labour market structures as a symptom of societal monetary undersupply enhance old-age poverty tendencies (Bosch 2012, 28 f.; Springer 2014; Leban 2013). The upcoming dimensions of this phenomenon are only approximately foreseeable as low wages do not cover an old-age protection. Considering, the demographic development of the Austrian population in combination with atypical employment tendencies, the national expenses for pension benefits increase exorbitantly. The fact, that this development is under evaluated from public interests or media, implies the social and economic importance of this public concern. According to Leban (2013) the public expenses will increase without any significant countermeasures from 6.8 billion Euros in 2010 to the triple in 2035. Consequently, national pension benefits will decrease, because of the higher life expectancies – the number of persons who receive pensions constantly rises as well as their pension periods (Leban 2013; Traunmüller 2014).

The pressure of financialization on nation-states

The importance of the welfare state structures in Austria is only partly tangible, because without them the poverty rate would be at 44 percent instead of the actual rate of 14.4 percent in 2014 (Fabris 2014). Even though, economists demand the realignment to a more performance oriented welfare state, which pursuits instead of the goals of welfare state principles of decreasing social gaps, social-political activation strategies in terms of self-responsibility and self-discipline according to the neoliberal dictate (e.g. Michalitsch 2006; Castel 2011; Wichterich 2011; Butterwegge 2009).

Since the 1970s, nation-states are intensively under pressure and are increasingly responsible for the hidden monetary undersupply, which occurs as inflation, stagflation and high unemployment. Consequently, states lose increasingly sovereignty, national political-economic scope shrinks and due to the opening of national economies its autonomy declines as well. Keynesian political instruments of demand management get replaced by new structures which support and secure flexibilization, supply of innovative capacities, technical competences and the subsidy and the rate reliefs for corporations form new governmental priorities. Modernized states in neoliberal economic policies illustrate the stage of capitalism in which national monopolies get replaced by transnational corporations as the representative force of the economy. The erosion of national states characterizes in terms of the hegemonic shift to global players the precondition as well as the consequence of this politic-economic realignment (Michalitsch 2006, 52-54).

The modernized politic-economic structure leads to new political-institutional structures. The executive obtains priority at the expense of parliamentary institutions. Ministries with intra-societal orientations, which are responsible for labor, education, social and cultural affairs, lose continuously autonomy; in contrast to world market oriented ministries such as finance, economy, technology and science define the new priority. In addition, the significance of little legitimized organizations such as the European central bank or the media increases, whereby social integrative organizations such as labor unions and parliaments get undermined. Economic and social competences transfer to the duty of the market, international independent institutions or individuals. The European project of integration approves itself as an example of depoliticization of the economy and the reconstruction of welfare to competition states, as economic and social functions and competences drift to the market and from political pressure protected international institutions which enhance the supranational coordination of national political areas and the intensified involvement of private stakeholders. Finally, governmental interventions against markets are undermined through authority-repressive forms of regulations and disunited ideologies (Michalitsch 2006, 53 f.; Traunmüller 2014).

Willke (2003) refers to the arising tensions through the economy as a societal partial system for the overall society, because of its own logic and the magnitude of the functional differences, which leads to a ruthless behavior at the costs of entire societies. The task of the nation-states is to mitigate these tensions, to secure law and order in case of unacceptable dimensions of these tensions (Willke 2003, 88). Neoliberal proponents demand a slim welfare state, whose savings partly move to additional costs of the security state (Castell 2011; Michalitsch 2006). The role of security measures increased significantly in the western societies within the previous years as well as their expenses such as the installation and maintenance of the nearly six million closed-circuit television cameras in Great Britain (Barrett 2010).

Tensions, undersupply and the shift of monetary power from public – the administrator of the resources of all of us – are heavily accelerated by the speculation with public assets and the numerous cases of losses in heights of several millions of euros to the top wealthy elite such as in the process of the traffic enterprises in Berlin which owned JP Morgen 204 million US-Dollars in 2014 (WeltN24 2014).

Moreover, modern states are characterized by another neoliberal pressure – privatization (Zerowsky 2005, 15), whose target is to hand off national duties and properties to the responsibility and authority of private enterprises or households (Michalitsch 2006). Consequences of these shifts are that existential societal concerns are continuously solved by “private” instances, which operate without any societal responsibility, undermine national legislatives and reduce the scope of influences and participation possibilities for labor unions, welfare institutions as well as the population itself. The possibility for the political participation of the population through democratic institutions gets more difficult and is not desired. Neoliberalism enhances the “anti-political versions of politics” (Michalitsch 2006, 53 f.; Traunmüller 2014).

The bondless effects of the financial system on the world society – financialization and monetary undersupply of society and economy

The complexity, coherence and linkage of economic structures as well as the social crises such as unemployment or poverty are from global natures, but with different effects of the crises on the globe. In the conglomerate of crises between 2007 and 2009 occurred several closely interwoven crises mainly food crises and starvation, the more noticeable climate change as well as the from the US initiated financial crises and their global impact, which were enhanced by several interim mechanisms such as pricing and demand, investments and bank lending, retransfers, employment effects and government transfers (Wichterich 2011). Consequently, the situation of poverty in Austria is significantly interwoven with the overall global situation, and thus it is only partial solvable through national measures, because it has become a global symptom of contemporary capitalistic and economic situation, enhanced through cascades effects such as climate change for instance (Traunmüller 2014).

The global consequences of this monetary trade, which is significantly driven by the FED and the boundless greed of some financial players, might be concluded by the crucial development in which monetary benefits exceed the value of human life – occasionally the speculation on food and raw materials. In this context, Brühl (2012) refers in an interview with the Jean Ziegler to the fact that in 2012 financial speculation on rice and on corn led to an explosion of their prices, which led to a catastrophe for 2.2 billion people, who are according to the World Bank as extremely poor classified, because they cannot afford their nutrition anymore. In addition, the bank rescue after 2008 and 2009 costed the west € 85 trillion led to the paradox situation that these banks never retransferred the money although their business went fine after short periods and they recorded remarkable profits in the years before. On the other side, western countries had to invest billions into banks to secure them and simultaneously

reduced or cancelled their contributions to the World Food Programme (WFP). The WFP disposed over a budget of \$ six billion dollars in 2008, which declined to the bank secure measures down to \$ 2.8 billion. However, the reasons of the destruction of the food supply in the global context are miscellaneous – financial speculation on food, agricultural dumping of the EU and the destruction of traditional agriculture in emerging countries or the overproduction of fuel, which exterminates the agricultural land for millions of nourishments (Brühl 2012).

The monetary undersupply is not only tangible for individuals in terms of poverty, underemployment and unemployment, but also for nation-states by the intensive purchase of government bonds by the ECB. Kai Konrad is a member of the economic counsellor of the German federal ministry and explains in an interview that an intensive purchase of government bonds by the ECB seems as the rescue of the Euro, however, in the middle term it threaten the ECB as well as the Euro and the ECB sacrifices itself at the end (Dams et al. 2015). The reputation of the ECB as an independent central bank can be threatened in this aspect and it could be involved into more political economic crises. However, a return of the ECB is hardly possible as Mario Draghi put the ECB with his commitments under pressure and has leaned himself far out of the window, even if it is has hardly benefits in the short run and harms in the long run (Dams et al. 2015).

The need for a fundamental change

Due to the complexity and comprehensive magnitude of contemporary global economic and financial issues, fundamental changes respectively reorientations are required both in collective and personal dimensions. To begin with, global financial markets structures need to be supervised by global regulations and control mechanisms as well as institutions (Felber 2009). It has been the biggest mistake of governments economically to create global markets without complementing them to appropriate policies of stability and redistribution. However, it has been less the failure of politics, because the global casino has been created by active legislation, but it is rather a failure of democracy. Instead of governments cared and worked for collective interests and targets of society to achieve economic stability, fair distribution and sustainable development, they enhanced the minor interests of a winning elite (Felber 2009; Stieglitz 2013).

The global contradiction of the global taxation is significantly shown by international taxation, as within free market profits get globalized but the corresponding tax duty remains national. Numerous reports and economic models refer to the fact that only the tax losses in European nations caused by multinational organizations lead to the monetary undersupply of nation-states and small and middle sized organizations, however, pay therefore in Austria and Germany, for instance, therefor higher taxes. Consequently and in general, essential duties and structures have to be added to national tax systems in order to prevent bigger damages of free trade and capital movements. Global tax authorities would be important to coordinate the tax structures and goals of nation-states and would prevent the boundless tax competition and the erosion of tax standards (Felber 2009).

The former goal of the Bretton Woods agreement – the fixation of raw material prices – ended with the creation of the International Trade Organization (ITO), which initially ought to regulate multinational organizations and determine raw material prices. However, this goal was not achieved, as the US and the UN-organization refused such competences. In reality poor countries compete better in their raw material exports with resulting declining prices down to minimum standards. Numerous financial derivatives and hedge funds would be obsolete at stable raw material prices as agreed in the Bretton Woods agreement in 1944 (Felber 2009). Numerous additional reorientations and redevelopments are fundamentally required in order to prevent bigger financial global outgrowths including a global financial market authority, the fulfilment and participation of economic, social, ecological and financial global conferences

and agreements, regulation of funds and derivatives, the consensus of monetary and human global travel policies, the regulation of the EU-domestic markets, no profit-orientation on financial markets, money creation into the hand of all members of society – the public, reorientations of shareholder values as well as the enforcement of truly commonweal instead of incessantly pursuit after profits.

However, although a change of political, economic, international and societal structures are highly necessary the role and responsibility of each member of society is totally under evaluated and definitely too less integrated in collective problem solving procedures. Several societal structures and informational exchanges mostly via mainstream media suggest that one person on its own has no power at all to change the contemporary system, which seemingly consists of million people in opposite (Felber 2008). However, these other-directed world believes result in powerlessness and suppresses of the own responsibility of actions and thinking and its importance in general. These people feel as they would be seemingly helpless against the system, the globalisation and the financial respectively economic system (Felber 2009). In reality, the first seemingly hard step, which costs a lots of overcoming, is the basis for change and success, as 99 people are much stronger than 1 person and in fact this one member of our collective is afraid of the majority and thus maximizes his power through the contemporary politic-economic structure in order to secures his power as long as possible, because at that moment, in which the majority of society recognized the situation and is ready to connect with each other, the global structure can be reorganized and be truly free and self-determined.

The contemporary system has developed itself through the previous hundreds of years. Consequently, the fundamental reshape respectively development can only be done with several separate steps. The first and also the most important step is everyone himself to be able to be truly free from systematic programs and effects such as the intemperate embodiment. In order to solve the contemporary fundamental issues on this planet we need to collaborate in quality with others and thus be able to accept others including their according to our point of rationality mistakes. In this respect, the acceptance of the learning procedure of humanity including oneself is the essence for a truly encounter with each other (Felber 2009). However, the attitude of each one of us contains high powers, as we show other cells how to enlighten and change life in practice. In this respect, the consumption behaviour is a key factor not only because of our health as regional and seasonal food, for instance, is the only sustainable food to maintain healthy and alive, regarding the contemporary cancer tendencies, as according to the WHO the cancer incidents will double themselves within the next years (WHO 2015). It is also the key to solve global ecological, ethical, economic and social problems.

As far as the history is concerned, the fulfilment of new ideas was steadily based on broad social movements. A fundamental societal change is based on the requirement of connecting with each other in terms of human rights-, environmental protection- and developmental organizations. However, the connection with people around is already very important in order to discuss about topics and solutions or just strengthen each other with similar point of views. One solution within such discussion is definitely the collective commitment and effort for more democracy and direct democracy (Felber 2009). Other essential areas of change and redevelopments are the food industry, global fair trade, markets or structures of non-monetary based exchanges, ethical banking, regionalisation of major monetary and political exchange, alternative energy sources, alternative living forms of housing, new integrative and complementary medicine structures, which serve the needs of the majority instead of a tiny minority as well as alternative forms of kindergartens and education.

Moreover, the transformation of contemporary power structure is based on the replacement of competition by cooperation. It is important to question contemporary especially monetary oriented values such as profit maximization and to replace them by heartfelt and honest contact with each other.

Conclusion and Discussion

This paper has discussed how modern financial and economic cycles close each other and are highly linked to contemporary major society issues including poverty or mass-unemployment. It is obvious that any economy or state on the globe is increasing their monetary digital assets in extraordinary and unregulated dimensions by mainly private and deregulated banks and simultaneously facing continuously increasingly serious issues and consequences of monetary undersupply.

To combine the point of view of Popp (2013), the recent economic cycle development and the international social crises of refugees and “terrorism” refer to the assumption that modern global society experiences historical repetition of deep mistakes: the warring distraction of deep economic and financial global crisis which cannot be solved anymore with our capacities. Popp (2013) refers to similar distraction tendencies before the First World War, whose emergence was according to him significantly influenced by international British diplomacy. In addition, after the First World War in the early 1920s Great Britain tried to convert the British Pound to the World Dominant Currency in Italy. On the Second try in 1944 the Federal Reserve in the US succeeded in order to implement the FED-Dollar as the World Dominant Currency, in an era in which many states were unable to vote, because they were either loosing enemies or facing the pressure of the exile such as Poland. Proissl (2015) refers based on several data such as the closeout (sellout) of raw oil such as of the incident of the raw material giant Glencore, who lost up to September 2015 30 percent of their stock value. In addition, the German economy experienced with the Volkswagen incident significant economic influences, with which the trust in products with the seal “Made in Germany” and their suppliers is weakened. The assumption that Volkswagen is the only “black sheep” in terms of green and ecological aspects overtakes utopian characteristics due to the rising international political and societal pressure, policies and standards of environmental protection in combination with the unlimited greed for profit-maximization and thus a limited willingness for high environmental and social expenditures within organizations. However, other industries are already proper famous for scandals such as parts of the nutrition and medicine industry. Consequently an avalanche of accumulating additional Volkswagen incidents, which harm the already instable global economy in its entirety, is not far-fetched. However, Proissl (2015) refers to the following major reasons for the volatile and uncertain financial markets and economic atmosphere:

1. The economic cycle uncertainty in China and the capability of coordinating the economy of the Chinese government.
2. The uncertainty on the raw material markets and the linked domino effect for the producer and exporters of feedstocks.
3. The monetary political uncertainty, as the FED is heading towards the first interest rate increase since 2006 and the intensive gold orientation although declining prices, enhanced by experiences in the previous crises in 2008/09.
4. The weak economic growth.
5. Inconvenient conditions on credit markets (Proissl 2015).

However, the contemporary little tangible hegemonial structures (Popp 2013) shape global financial structures and cause monetary inequalities, which are benefited for a tiny and wealthy percentage on the globe (Stiglitz 2013) also called as the monetary feudal nobility at the costs of the entire global society including economy, nation-states, society and especially individuals. Although the monetary digital value is continuously increasing mainly through uncontrollable money creation of private banks, global trade partners suffer under the supervision of the World Dominant Currency of the FED-Dollar under monetary undersupply or high inflationary challenges. In addition, this paper has also discussed direct coherences between these increasing

outgrowths and societal consequences for nation-states, economies, society and environment. Connecting the data above the transparency rises that financial market is a major tool apart from economics in general for the top wealthy percentage to enrich their wealth in intangible inherent dimensions at the costs of anything else.

Discussion of free market structures, which is known as the physical or electronic structure for two or more independent partners who close up a business with free and self-determined circumstances, got according to several data above for the majority a fiction, regarding unemployment, atypical employment, poverty, ecological developments and the allegedly situation of the World Dominant Currency structure itself – the FED-Dollar.

The accumulation of crises, whose contemporary importance and complex potential threats or consequences on society are mentioned by numerous experts and authors such as Felber (2009) or Wichterich (2011) get with recent developments of civil wars and tremendous dimensions of international social tensions more importance than ever. This is another crisis, which meets already numerous crises in western societies but also of individuals including massive rates of poverty, unemployment, societal segregation, ecological catastrophes, pressure of financialization, fundamental health risks and the increasing monetary undersupply. The question arises how many more added crises the system can cope with.

Concluding and combining the major points and structures of the contemporary global finance structure in its entirety, such as the economic growth opportunities after the Second World War, the fall of communism, the dominant global trade structure by the Federal Reserve and similar institutions such as the IMF or World Bank, the continuous technologization as well as the arising emerging markets and their new investment opportunities around the globe has supported the global finance partial in form of significant global economic and financial upturns. However, in the literature as well as in the political and economic context emerge continuously more ominous indications whether the contemporary system still keeps on running. The boundless economic greed for profit maximization, which we face in many societal sectors and not only on the economic and financial markets, is occasionally explained in the business term “*The cow is so long and intensively milked until only blood comes out*”. It seems as, underlined by prosaic developments such as stagnant economic growths in the previous years in combination with recession tendencies or the increasing international and ethical tensions in combination with tendencies for growing economic needs for wars, such economic growths boosts of capitalism have been vanished. Consequently, the contemporary form of the current global finance structure has presumably achieved its kind of dead end as numerous experts such as Popp (2013), Felber (2008, 2009), Michalitsch (2006) or Stiglitz (2013) emphasize that it is too late for small realignments and solvation measurements in order to cope the contemporary scope of financial, economic and societal issues. However, it seems as this is well known in driving forces and thus international deep tensions function as distraction factors, as their origin is significantly influenced by western international diplomacy similar to the situation of one hundred years ago. Moreover, behind international tensions of wars were highly linked to economic and power advantages of western institutions, organizations and states such as the cheap and standardized access of oil. Moreover, as Proissl (2015) illustrated occur new forms of behaviour of multinational raw material organizations and nations such as deep stock declines or new oil access of Arabian countries in east-Asia. The paper points the fact out that the current international issues can be only solved by fundamental new societal structures, which exceeds contemporary realignments and measures in economic and financial subsystems of society – deep-fundamental values, norms and worldviews must be questioned and adopted to truly supportable ones and serve us humans and our living environment – our planet earth. This includes questioning as well as to adopt or dissolve any institution and societal structure including non-economic ones, which enhanced and did not truly try to solve our collective challenge up to the present. *We live, control and form our lives including all the consequences.*

References

- Andrianova, S., & Demetriades, P., Xu, C. (2008). Political Economy Origins of Financial Markets in Europe and Asia. University of Leicester. <http://www.le.ac.uk/economics/research/RePEc/lec/leecon/dp08-1.pdf>.
- Assa, J. (2012). Financialization and its Consequences: the OECD Experience. Finance Research VOL. 1, NO. 1, Academia. San Francisco, US.
- Barret, D. (2010). One surveillance camera for every 11 people in Britain, says CCTV survey. <http://www.telegraph.co.uk/technology/10172298/One-surveillance-camera-for-every-11-people-in-Britain-says-CCTV-survey.html>.
- Beattie, A. (2015). The Birth of Stock Exchange. Investopedia. <http://www.investopedia.com/articles/07/stock-exchange-history.asp>.
- Bodenhorn, H. (2000). A History of Banking in Antebellum America, Financial Markets and Economic Development in an Era of Nation-Building. Cambridge University Press. Cambridge, United Kingdom.
- Bosch, G. (2012). Prekäre Beschäftigung und Neuordnung am Arbeitsmarkt. Expertise im Auftrag der Industriegewerkschaft Metall. Universität Duisburg Essen, Germany.
- Brinkmann, U., & Dörre, K., & Röbenack, S., & Kraemer, K., & Speidel, F. (2006). Prekäre Arbeit. Ursachen, Ausmaß, soziale Folgen und subjektive Verarbeitungsformen unsicherer Beschäftigungsverhältnisse. Friedrich-Ebert-Stiftung, Bonn, Germany.
- Burne, K. (2013). Die gefährlichste Waffe der Wall Street kehrt zurück. The Wall Street Journal Germany, wsj.de. <http://www.welt.de/wall-street-journal/article116845374/Die-gefaehrlichste-Wette-der-Wall-Street-kehrt-zurueck.html>.
- Butterwegge, C. (2009). Armut in einem reichen Land. Wie das Problem verharmlost und verdrängt wird. Campus Verlag GmbH, Frankfurt/Main, Germany.
- Brühl, J. (2012). „Nahrungsmittelspekulation ist ein Verbrechen gegen die Menschlichkeit“. SZ. <http://www.sueddeutsche.de/wirtschaft/jean-ziegler-im-gespraech-nahrungsmittelspekulation-ist-ein-verbrechen-gegen-die-menschlichkeit-1.1469878>.
- Castel, R. (2011). Die Krise der Arbeit: Neue Unsicherheiten und die Zukunft des Individuums. Hamburger Edition HIS Verlagsges. mbH. Hamburg, Germany.
- Dams, J., & Ettel, A., & Jost, S. (2015). Ökonomen warnen vor „Atomwaffe der Geldpolitik“. <http://www.welt.de/wirtschaft/article136238053/Oekonomen-warnen-vor-Atomwaffe-der-Geldpolitik.html>.
- Duménil, G., & Lévy, D. (2005). Costs and Benefits of Neoliberalism: A Class Analysis. In: Epstein, G. (ed.): Financialization and the World Economy. Edward Elgar. Cheltenham, United Kingdom.
- Ek, S., & Holmlund, B. (2014). Part-time unemployment and optimal unemployment insurance. Springer Science+Business Media New York 2014.
- Eichhorst, W., & Marx, P., & Thode, E. (2010). Atypische Beschäftigung und Niedriglohnarbeit, Benchmarking Deutschland: Befristete und geringfügige Tätigkeiten, Zeitarbeit und Niedriglohnbeschäftigung. Bertelsmann Stiftung, Gütersloh, Germany.
- Epstein, G., A. (2005). Financialization and the World Economy. Edward Elgar. Cheltenham, United Kingdom.
- Fabris, V. (2014). Armut und Reichtum in Österreich. Volkshilfe. http://www.volkshilfe-bgld.at/images/content/files/Armut_Zahlen_J%C3%A4hner2014.pdf.
- Felber, C. (2008). Neue Werte für die Wirtschaft, Eine Alternative zu Kommunismus und Kapitalismus. Deuticke im Paul Zsolnay Verlag, Vienna, Austria.
- Felber, C. (2009). Kooperation statt Konkurrenz, 10 Schritte aus der Krise. Deuticke im Paul Zsolnay Verlag, Vienna, Austria.
- Jilch, N. (2012). Teuerung: Umverteilung von unten nach oben. diePresse. http://diepresse.com/home/wirtschaft/economist/1327496/Teuerung_Umverteilung-von-unten-nach-oben.
- Kedrosky, P., & Stangler, D. (2011). Financialization and Its Entrepreneurial Consequences. Ewing Marion Kauffman Foundation Research Series.
- Langley, P. (2008). The Everyday Life of Global Finance: Saving and Borrowing in America. Oxford University Press, Oxford United Kingdom.
- Leban, K. (2013). Ohne Privatvorsorge droht die Altersarmut. http://www.wienerzeitung.at/nachrichten/wirtschaft/oesterreich/585510_Ohne-Privatvorsorge-droht-die-Altersarmut.html.
- Levine, L. (2012). Offshoring (or Offshore Outsourcing) and Job Loss Among U.S. Workers. CSR Report for Congress, Congressional Research Service. <http://www.fas.org/sgp/crs/misc/RL32292.pdf>.
- McLeay, M., & Radia, A., & Thomas, R. (2014). Money Creation in the modern economy. Bank's Monetary Analysis Directorate. <http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q102.pdf>.

- Michaelis, O. (2011). Die Systemfehler der Finanzkrise. Michaelis Verlag, Köln, Germany.
- Michalitsch, G. (2006). Die neoliberale Domestizierung des Subjekts. Von den Leidenschaften zum Kalkül. Frankfurt am Main/New York.
- Neff, M., & Schlegel, N. B., & Christen, A., & Graf, S., & Künzi, D., & Merki, M., & Nowak, A., & Wicki, C. (2012). Swiss Issues Branchen: Herausforderungen Pensionskassen 2012, Aktuelles Stimmungsbild und Hintergründe. Credit Suisse, Zürich, Swiss.
- Neuberg, A. (2015). Geld-Illusion, Finanzfeudalismus Konfusionen und Philosophien. Pro BUSINESS GmbH, Berlin, Germany.
- Popp, A. (2013). Der Währungscrash, Das verfehlte Geldsystem: Ursachen und Lösungen. FinanzBuch Verlag, Munich, Germany.
- Proissl, A. (2015). Der große Knick: Droht eine weltweite Rezession? Format. <http://www.format.at/finanzen/boerse/droht-rezession-5875526>.
- Putz, S. (2014). Die Arbeitsmarktlage Ende Juni 2014. Arbeitsmarktservice Österreich. http://www.ams.at/_docs/001_monatsbericht.pdf.
- Rosa, H. (2009). Kapitalismus als Dynamisierungsspirale. Soziologie – Kapitalismus – Kritik, eine Debatte. Suhrkamp Verlag, 87-125.
- Schweighofer, J. (2013). Wird Arbeitslosigkeit in Österreich richtig gemessen? <http://blog.arbeitswirtschaft.at/wird-arbeitslosigkeit-in-oesterreich-richtig-gemessen/>.
- Stephey, M. J. (2008). Bretton Woods System. Time. <http://content.time.com/time/business/article/0,8599,1852254,00.html>.
- Stiglitz, J. E. (2003). Globalization and its discontents. W.W. Norton & Company, Inc. New York.
- Stiglitz, J.E. (2013). The price of inequality: „The single most comprehensive counterargument to both neoliberalism and laissez-faire theories”. Penguin Books, London/New York.
- Sommer, B. (2010). Prekarisierung und Ressentiments. Soziale Unsicherheit und rechtsextreme Einstellungen in Deutschland. VS Verlag für Sozialwissenschaften, Springer Fachmedien Wiesbaden GmbH, Wiesbaden, Germany.
- Springer, G. (2013). Rund 1,2 Millionen Österreicher sind armutsgefährdet. derStandard. <http://derstandard.at/1385171288430/Rund-12-Millionen-Oesterreicher-sind-von-Armut-gefaehrdet>.
- Statistik Austria (2014a). Armut und soziale Eingliederung. http://www.statistik.at/web_de/statistiken/soziales/armut_und_soziale_eingliederung/.
- Stegemann, T. (2009). Billige Arbeitskräfte in der Sackgasse. <http://www.heise.de/tp/artikel/30/30478/1.html>.
- Techt, K. (2014). Voest droht mit Abwanderung in die USA. Kurier. <http://kurier.at/wirtschaft/unternehmen/voest-droht-mit-abwanderung-in-die-usa/61.349.240>.
- Till-Tentschert, U. (2012). Armut in Österreich – statistisch betrachtet. Vienna.
- Trautmüller, M. (2014). The modern labor market and its affinity to poverty on the example of the Austrian Welfare State. Johannes Kepler University Linz, Austria.
- Wagner, N. (2013). Atypische Beschäftigung in Österreich: Bisherige Entwicklungen, aktueller Stand und Aussichten für die Zukunft. WISO – Wirtschafts- und Sozialpolitische Zeitschrift Nr. 4/13 Dezember 2013, 71-88.
- WeltN24, (2014). Sarrazin „wusste nicht, um was es genau geht“. Berlin. <http://www.welt.de/wirtschaft/article125476259/Sarrazin-wusste-nicht-um-was-es-genau-geht.html>.
- WHO (2015). World Cancer Report 2015. World Health Organization. <http://www.who.int/mediacentre/factsheets/fs297/en/>.
- Wichterich, C. (2011): Krise der Ernährermännlichkeit und neoliberale Gleichstellung durch die Krise. In: Bader, P., & Becker, F., & Demirovic, A., & Dück, J. (ed.): Vielfachkrise. Im finanzmarktdominierten Kapitalismus. VSA Verlag, Hamburg, Germany. P. 129-145.
- Willke, G. (2003). Neoliberalismus. Campus Verlag, Frankfurt/New York.
- Young, B. (2013). Finanzialisierung, Neoliberalismus und der deutsche Ordoliberalismus in der EU-Krisenbewältigung. In: Heires, M., Nölke, A. (ed.): Politische Ökonomie der Finanzialisierung. Springer Verlag, Wiesbaden Germany, P. 63-77.
- Zerowsky, G. (2005): Der Neoliberalismus als neuer Feind des Staates? Hauptseminar: Geschichte und Zukunft des Staates als politischer Institution. <http://akj.rewi.hu-berlin.de/projekte/seminararbeiten/Zerowsky1.pdf>.
- Zschäpitz, H. (2011): Vor 40 Jahren begann die Ära des Gelddrucks. Die Welt. <http://www.welt.de/finanzen/article13546275/Vor-40-Jahren-begann-die-Aera-des-Gelddrucks.html>.

TIMING CONCEPTS AFFECTING THE ODDS OF SUCCESS OR FAILURE OF M&AS

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Abstract: *M&As are a strategic instrument to grow for corporations. However, acquiring corporations have to face a large number of challenges to really succeed in merging two organisations. Half of all transactions have been failing resulting in disastrous write-offs and losses for corporations. Research has been trying to find a panacea against M&A failure for years investigating motives, synergies, performance and the M&A process. In more detail, research has focused on different timing concepts: market timing and integration speed. Other timing concepts seem to have been neglected so far, although several cases show early evidence for their existence. The purpose of this paper is to identify further concepts of timing besides integration speed and market timing. In order to identify such concepts the author has chosen a qualitative meta-analysis. The author has collected 30 cases of past mergers within various industries. To avoid any bias, the collection consists of 15 successful and 15 failed mergers. These cases have been investigated for any codes highlighting timing concepts. This study reveals six timing concepts with crucial impact on the M&A outcome: time for acquisition, M&A duration in its entirety, M&A sequence, synergy chronology, frequency of acquisitions and time to step back. The extent of their impact varies as does the ability to control them. Most important are the M&A sequence and synergy chronology as they do have the highest impact and are most likely to be controlled by acquiring corporations. It is suggested to focus on these timing concepts in future research.*

Keywords: *M&A, success, timing concepts, process, synergy*

Introduction

A corporation's possibilities for an organic growth are often stretched to its limits due to market saturation or the lack of knowhow. Mergers & Acquisitions (henceforth M&As) are therefore seen as an alternative way to grow (Rovit et al., 2004).

Various definitions for M&As can be found in literature as different authors and researchers try to describe that process. Sirower (1997) compares M&As with major R&D projects or plant expansions and defines them as capital budgeting decisions. He put it straight as he sees M&As as a purchase of assets and technologies. Bruner (2009) differentiates between mergers and acquisitions. A merger is a consolidation of two corporations to create a new one, also known as fusion, characterised by the necessity of a new structure. An acquisition simply constitutes a purchase. However, regarding the economic impact of M&As both terms can be used interchangeably, a differentiation is only needed for legal, accounting and tax issues (R.F. Bruner & Levitt, 2009). In business M&A is the hypernym for any kind of business transaction. Angwin (2007) states that an acquisition is the purchase of controlling interest of company A in company B. Ahern and Weston (2007) define M&As as the purchase of entire companies or certain assets by another corporation. In more detail, they mention that M&As can be seen as a new combination of existing assets, where the new combination will be more productive.

Moreover, the opinion is held that M&A should include takeovers, tender offers, alliances, joint ventures, minority equity investments, licensing, divestitures, spin-offs, split-ups, carve-outs, leveraged buy-outs, reorganisations, restructuring, and recontracting associated with financial distress and other adjustments (Ahern & Weston, 2007).

The history of the M&A market itself is characterised by disastrous transactions, justified upfront by various synergies, leading to enormous write-offs as such promised synergies failed to materialise (Ficery et al., 2007). The acquisitions of Time Warner or Columbia Pictures by AOL or Sony Pictures are only few examples for synergy driven transactions with a terrible outcome.

M&As are a very complex and challenging research agenda. Epstein (2005) has identified several critical issues among the execution process of M&A, trying to focus corporations' attention to these factors. Additionally, Rovit et al. (2005) have developed certain key rules which might increase the possibility to succeed. Especially, the post-merger integration (henceforth PMI) has been highly discussed in literature. Angwin (2014) tries to carve out a constant process for PMI activities as there is still no coherent solution in various theory approaches. However, a panacea against failure is still not found.

A large part of the literature tries to question the motives behind M&As (Barnes, 1998; Berkovitch & Narayanan, 1993; Bradley et al., 1988; Gruca et al., 1997; Hodgkinson & Partington, 2008; Morck et al., 1990; Shleifer & Vishny, 2003; A. Shleifer & Vishny, 1989; Trautwein, 1990). In literature, motives can be distinguished between shareholder value increasing and non-shareholder value increasing motives. Value-increasing motives are characterised by expected synergies (Bradley et al., 1988). Non-shareholder value increasing motives have been investigated in more detail, revealing three major motives: agency theory, hubris and market timing. Thus, motives can be factors predetermining the outcome of M&A transactions (Barnes, 1998; Moeller et al., 2004; Roll, 1986; A. Shleifer & Vishny, 1989; Trautwein, 1990).

Furthermore, Nguyen et al. (2012) investigate which motives are more distinct in justifying a deal. Trautwein (1990) and Sirower (1997) state that main motive for transactions are synergies.

The question of how to measure success of M&As has been investigated since the 1960s. Research has not yet generated coherent definitions for M&A performance or definite factors declaring success or failure (Das & Kapil, 2012). Bild et al. (2002) further point out that financial measures alone are not sufficient for M&A performance. Das and Kapil (2012) provide a paper dealing with different explanations of M&A performance and possible KPIs to capture success or failure of M&As.

Driven by globalisation, M&As take place internationally. Motives for cross border acquisitions have changed over time. Started by the intention of First World corporations to invest in emerging markets such as Brazil, Russia, India and China (henceforth BRIC), Caiazza & Volpe (2015) study a new trend: emerging country corporations are investing in development countries corporations (Caiazza & Volpe, 2015).

Another trend occurring in M&A transactions are divestitures. The global financial crisis is the first driver for divestitures as corporations have been urged to rethink their strategy. Since 2011, corporations have identified divestitures as a further factor to generate synergies. Moreover, Svensson et al. (2012) point out the significant role of divestitures for the research and universities sector (Caiazza, 2014; Caiazza et al., 2014).

Besides specific studies, research intends to provide general key success factors for M&A transactions (Epstein, 2005). Rovit et al. (2004) have developed a first approach for a guide. McKinsey, BCG and Accenture support research in M&A with focus on acquisition strategies, divestitures, synergies and success factors.

Up to now, there are three essential findings, (1.) Synergies are the main motive for mergers (Berkovitch & Narayanan, 1993; Trautwein, 1990), (2.) their mishandling is the reason

for most failures (Ficery et al., 2007; Sirower, 1997) and (3.) as every merger differs from another; a general guide seems not to be feasible (Rovit et al., 2004). As a result, research has started to focus on the stages of the M&A process in detail.

In literature the PMI is mentioned as a significant step, as it is the beginning of the synergy realisation process (Haspeslagh & Jemison, 1991). A high number of transactions have failed due to an often insufficient or not existent integration process (D. N. Angwin & Meadows, 2014). The evaluation is another step influencing the failure or success of a transaction. Any errors occurring in this step could lead to overpayment for a target. If a target is not worth its price and generating the expected value, high write-offs are the result (Ficery et al., 2007). In most cases PMI and evaluation have failed as the synergy recognition process and due diligence have not been carried out carefully (Garzella & Fiorentino, 2014). If the potential synergies are not captured correctly it is not possible to evaluate and integrate them in a right way (Ficery et al., 2007).

Although years of research have been invested to find the panacea against M&A failure, the success rate still amounts to approximately 40% -50% (10 years ago: 80 %- 90%) (Cartwright & Schoenberg, 2006). Additionally, the merger market has reached a peak in 2014 since the financial crisis in 2007 and is expected to increase in 2015 (KPMG, 2014). Moreover, the merger market is characterised by megadeals, e. g. the acquisition of WhatsApp Inc. for \$ 19 billion by Facebook Inc., where synergies are the most valuable asset (Ernst&Young, 2014). Any failure in pre-deal assessment could lead to disastrous write-offs, so a sufficient M&A process, which considers synergies in more detail, is more needed than ever.

The importance of this stage seems to be obvious, but research in this topic is extremely scarce. Only in 2014 a first approach for a pre-deal decision model in order to capture synergies correctly has been developed. Four crucial factors needed to know in pre-deal activities have been identified: the type, timing, size and likelihood of synergies. Various approaches to categorise synergies already exist (Robert F. Bruner, 2002; Damodaran, 2005; Eccles et al., 1999; Goold & Campbell, 1998). Timing is determined to realise synergies as quick as possible after closing (Garzella & Fiorentino, 2014). Generally, timing regarding M&As is primarily expressed in terms of integration speed (D. Angwin, 2004; Homburg & Bucerius, 2006), market timing (Shleifer & Vishny, 2003) and a limited time frame to execute the transaction (D. Angwin, 2004; Bert et al., 2003). Herd and McManus (2012) mention briefly a possible impact of the economic situation. Any other possible meanings of timing and their impact on the success or failure of M&As seem to be neglected so far.

Several acquisitions obtain early evidence that other meanings of timing may be existent: e.g. Sony Pictures acquisition of Columbia Pictures failed as the management was not able to deliver the needed resources on time after closing. Pennsylvania and NY railroad ended in bankruptcy, mostly due to the fact that they did not plan integration in advance. AOL and Quaker Oats failed as synergies did not materialise in the expected timeframe, whereas Disney flourished as it developed a synergy management system (R.F. Bruner & Levitt, 2009; Rukstad & Collis, 2009).

There is a gap in research as no other concepts of timing have been considered to predetermine the outcome of M&A transactions. This paper aims to reduce this gap by identifying further timing concepts that might have been overlooked in research so far. Other concepts considered by corporations might increase their chances of success in M&A deal execution.

Therefore, this paper sets out to identify such possible concepts of timing and asks:
Which concepts of timing can be identified to have a crucial impact on the M&A process?

In order to answer this question, the following guiding questions are followed:

- How can timing concepts be identified from narrations in the cases?
- Do the identified timing concepts determine the outcome of M&A transactions concerning their impact on synergies/on the M&A process/on M&A success?

In order to answer these questions the author collected various case studies dealing with past M&A transactions. The cases were derived from peer-reviewed journals and the book “Deals from Hell”, in order to get an extensive collection of successful and failed mergers in various industries (R.F. Bruner & Levitt, 2009).

According to Denzin and Lincoln (2003), these case studies have been investigated for codes pointing out timing concepts. The concepts arising in literature review are used as first indicator to support the identification of other timing concepts. Additionally, inductive codes were carved out by an interpretative approach (Denzin & Lincoln, 2003). These codes highlight when the timing concepts determine the outcome of a M&A transaction. Finally, the inductive codes were summarised to major themes and propositions.

Literature Review

M&A is a topic with a highly diversified research agenda from various perspectives and domains. For years literature has been trying to identify essential motives and their impact on the success of a merger.

Trautwein (1990) has identified certain theories for merger motives: monopoly, raider valuation, empire building, process theory and disturbance theory based on motives of merger waves. Further research has been necessary to identify more state of the art motives. As aforementioned, motives can be distinguished between value-increasing and non-value-increasing values. Value-increasing motives are characterised by synergistic expectations by combining two different operations (Bradley et al., 1988). Further value enhancement could be caused by tax or cash benefits, but their importance is not as high as operational excellence (Auerbach & Reishus, 1988; Ghosh & Jain, 2000; Healy et al., 1992).

Far more complex are non-value-increasing motives. These motives are not justified rationally and are not resulting in shareholder value enhancements. Research has revealed three major misguided motives: Agency problems arise when managers try to exploit shareholders and are driven by personal interest. Managers are more interested in increasing the firm size than shareholder value due to managerial objectives (Morck et al., 1990). Hubris describes managers which are overestimating themselves. Managers pay high premiums for actually non-existent synergies, resulting in high write-offs when these synergies do not materialise (Moeller et al. 2004). A huge number of mergers have been motivated by hubris (Barnes, 1998; Berkovitch & Narayanan, 1993). Market timing is also seen as non-value-increasing motive. Shleifer and Vishny (2003) have found that most acquirers try to buy undervalued targets, however, both corporations could be overvalued (Shleifer & Vishny, 2003). Acquisitions of overvalued targets result in low post-merger returns (Dong et al., 2006).

Further research tries to figure out which motives have a leading role in M&A activities. Various literature show that mergers may be driven by multiple motives. In the UK, synergies and market timing do play a prioritised role in justifying deals (Arnold & Parker, 2009; Hodgkinson & Partington, 2008). Nguyen, Yung and Qian (2012) have carried out an advanced study to question any motives and their impact on the success of M&As. They have investigated mergers, their motives and the long-run performance after deal closing. Their findings are that synergies, market timing, agency/hubris and response to economic shocks represent merger motives. Moreover, single motivated mergers are very scarce. So, it is very difficult to separate motives and their impact in detail as value-increasing and no-value-increasing motives coexist

(Nguyen et al., 2012). However, it is necessary to point out that Nguyen, Yung and Qian's study only covers the U.S merger market.

M&As take place for decades, yet there is no consistent solution to define M&A performance (Meglio & Risberg, 2011). Das and Kapil (2012) have a tried to sum up different approaches defining M&A performance in order to find an ultimate expression. Furthermore, they have explained various approaches to monitor M&A performance and collected different KPIs to express performance.

There are two approaches existing in capturing performance of M&As: event studies and outcome studies (Das & Kapil, 2012). Event Studies are part of financial literature, whereas outcome studies are used by industrial organisation economists. Outcome studies investigate the pre- and post-acquisition performance and compare the merging corporations with matching corporations or the same industry (Tichy, 2001). In event studies, stock market reactions to the events that arise at the time of an M&A or in its aftermath are investigated (Das & Kapil, 2012; Tichy, 2001).

Empirical studies in M&A performance also diversify objective and subjective assessments. Subjective measurements are focused on degrees of synergy realisation, integration effectiveness and strategy gap reductions. Objective assessments focus on accounting performance, market performance and other operational data to describe performance. In addition to that, long-term and short-term performance should be distinguished (Das & Kapil, 2012).

Zollo and Meier (2008) have identified the following performance categories: integration process, employee retention, customer retention, accounting performance, long term financial performance, short term financial performance, acquisition survival, innovation performance, knowledge transfer, systems conversion, variation in market share and overall acquisition performance. They have reduced these categories to three main hypernyms: task and transaction levels of analysis, long term financial performance and short term window event study metrics (Zollo & Meier, 2008).

Studies also try to identify common variables to measure performance of M&As. Four main groups of KPIs have been classified through various research: accounting measures, market-related measures, other objective measures and subjective measures (Das & Kapil, 2012). The following table presents few examples of KPIs for M&A performance measurement.

Table 1. M&A KPIs, source: author, adapted from Das & Kapil (2012)

<i>Accounting measures of M&A performance</i>	<i>Market measures of M&A performance</i>	<i>Other objective measures of M&A performance</i>
Asset growth	Acquirer long-term market return	Age of firm
Return on Equity (ROE)	Total long-term return	Deal Value
Return on Investments (ROI)	Total short-term gain to acquirer and target	Research Intensity
etc.	etc.	etc.

Globalisation has led to a more competitive environment for corporations and the possibilities to grow within borders are limited. As a result, cross border mergers have become a trend as new markets, clients or resources are available abroad (Hitt, 2000). Especially, acquisitions in BRIC nations have been in great demand to get access to special resources (Schneider et al., 2009). Since the financial crisis in 2007, corporations have been more cautious about international investments. Additionally, legal issues have hardened the process of cross border

mergers (Gogan et al., 2013). Furthermore, cultural clashes are still a very sensible aspect in cross border mergers and a common reason for M&A transactions to fail (Halsall, 2008; Weber et al., 2012). However, in 2015 a reversed trend seems to be arising concerning cross border investments. Emerging market corporations are interested in acquisitions of developing market corporations (Caiazza & Volpe, 2015). Both authors try to question this trend. Emerging markets are often characterised by terrorism, corruption, etc. but there is need to grow. As a result, they invest in certain developing countries, but it should not be neglected that a far more extensive due diligence is necessary in such kind of deals (Caiazza & Volpe, 2015).

The first trend of divestitures has been driven by the global financial crisis. Corporations have had to rethink their strategic focus and therefore decide which business units bear no core competence (Dobbs et al., 2009). Divestitures have been necessary to survive, however, after the aftermath of the financial crisis they have been identified as a new opportunity to grow too (Dobbs et al., 2009; Kengelbach et al., 2014). The Boston Consulting Group (BCG) has investigated current motives for divestitures. Drivers for a higher occurrence of divestitures are value enhancements due to focus on core business, generating excess cash and improving the operating performance. Corporations have to rethink if an asset or business unit generates sufficient value within its organisations or could perform better on its own (Kengelbach et al., 2014). Best examples for divestitures are corporations like P&G, Kraft and Pfizer. P&G sold its Pringles brand to Kellogs, Kraft and Mondelez splitted and Pfizer sold its animal healthcare and baby nutrition segment to Nestlé. They all generated value enhancement due to their divestitures, however, a corporation needs to find the proper exit strategy (Kengelbach et al., 2014). Corporations have to decide between spin-offs, where the asset is going to be sold to the company's shareholders; trade sales, where a third party will be involved and a carve-out, in which the parent company sells a partial interest to the public while retaining ownership (Kengelbach et al., 2014). Especially, spin-offs are commonest at the merger market, as they often promise new possibilities in some industries (Ernst&Young, 2014a). In the U.S, spin-offs are used more often in public research institutions. Such institutions could be universities or national research centres, which aim is to turn research into an economic activity. They can use spin-offs to use HR and knowledge for commercial purposes. In Europe and Asia this concept is not mature yet (Caiazza, 2014). Only few corporations succeed with this concept as it is a great challenge to find a suitable catalyst willing to support the transfer of knowledge. In Sweden and Finland tech parks have been created by Nokia, Saab and Ericsson to support local universities and start-ups. In France, L'Oréal has tried to operate spin-offs, but this concept has failed as the corporation and its labs have not been willing to share knowledge and mistrusted any outsiders (Caiazza et al., 2014). Spin-offs are also a possibility for employees who want to start a new company in a niche market the parent company is not willing to enter. However, the parent company supports the employee with its experience and knowledge (Furlan & Grandinetti, 2014). Besides, divestitures are also a result of subpar prior investments and it is expected that the share of divestitures will rise on the merger market (Ernst&Young 2014b).

Additionally, research identifies some general key success factors, such as starting with small acquisitions bearing low risk to gain first experiences on acquisitions. The establishment of a core deal team also enhance the chances for success. It should be avoided to catch the deal fever, meaning to stay rational during the acquisition process (Rovit et al., 2004). McKinsey tries to identify acquisition strategies which could lead to a shareholder enhancement at any time. In 2010, they have presented the five types of successful strategies:

- Improve the target company's performance
- Consolidate to remove excess capacity from industry
- Accelerate market access for the target's (or buyer's) products
- Get skills or technologies faster or at lower cost than they can be built
- Pick winners early and help them develop their businesses

In addition to the acquisitions strategies given above, a few more exist but they might generate value extremely rarely (Goedhart et al., 2010).

All in all, only a sufficient strategic vision and fit, the best deal structure (price premium and financing type), an extensive due diligence, the premerger planning and the PMI are crucial key factors, predetermining the success of mergers (Epstein, 2005).

These are all important stages of the M&A process, so various researchers have investigated these stages for their pitfalls and tried to develop an improved model. Table 2 gives an overview of various approaches and points out any accordance and divergence of the M&A process approaches.

Table 2. M&A process approaches – overview, source: author, based on Galpin (2014), Glaum & Hutzschenreuter (2010), Haspeslagh & Jemison (1991), Keuper (2006), Langford & Brown (2004), Paulson & Huber(2001)

Authors	Process Steps							
Haspeslagh/ Jemison (1991)	Strategic Fit		Pre-acquisition decision making		Post-acquisition Integration		Learning	
Glaum/ Hutzschenreuter (2010)	Strategical Planning		Evaluation	Negotiation	Integration			
Paulson/Huber (2001)	Finding the Candidate	Meetings	Due Diligence		Negotiating & Signing			
Langford/ Brown (2004)	Strategy	Screening	Evaluation	Negotiation	Integration		Tracking	
Glahn/Keuper/ Hafner (2006)	“Beforehand” Phase		Transaction Phase		Integration Phase			
Galpin/Hendon (2014)	Formulate	Locate	Investigate	Negotiate	Integrate	Motivate	Innovate	Evaluate

Glaum and Hutzschreuter (2010) describe the traditional approach for the M&A process, consisting of four main stages. In strategical planning research states to look out for the perfect strategic fit also considering possible synergies. Due Diligence is a very important task of strategical planning. Beside traditional financial, tax, commercial, etc. due diligence, it

becomes necessary to consider organisational, environmental and integration issues in due diligence process (Galpin, 2014).

A careful and accurate evaluation of a target is the basis for a successful negotiation process. Through a right evaluation overpayment could be avoided. In general the classical DCF method is used to generate the intrinsic value of a corporation in respect of the possible CFs in the future. Even in regards to synergies this approach can work, if synergies are characterised and understood correctly (Demirakos et al., 2004). Calandro et al. (2007) bring up the Graham & Dodd (G&D) valuation model to improve the odds of a merger success. Although the G&D approach might be able to deliver a more accurate price expectation, it is still not yet used constantly in corporate M&A processes. It is a fact, if the due diligence is not carried out properly that approach is worthless (Calandro et al., 2007).

In PMI, researchers suggest to bring in a special integration team. These teams should work separate from organisations usual operational managers, to avoid any interruptions of the daily business. However, it is necessary to integrate the integration special force as early as possible so they are able to plan integration in the best possible way after closing of the deal. It is recommended to already let them attend the due diligence process (Rovit et al., 2004). Especially, cultural issues need to be considered at this stage as well. It is fundamental to identify any hurdles as early as possibly to react on time against them (Holland & Salama, 2010; Joseph, 2014; Larsson & Finkelstein, 1999; Marks & Mirvis, 2011; Mitchell & Shaver, 2003; Wayne & Alzira, 2010). Additionally, the mode of integration is a crucial factor determining corresponding integration activities. Based on the need for strategic independence and organisational independence, integration can be seen as absorption, preservation and symbiosis (Haspeslagh & Jemison, 1991). In literature, integration is consisting of two main tasks. Firstly, it has to enable value growth based on synergies. Next, it has to maintain the shareholder values of both corporations and avoid any value destruction. Therefore, it is needed to find a suitable performance measurement system, which often is of a great challenge (Gates & Very, 2003). An approach for a PMI performance measurement system is the performance prism. This prism focuses on the most important stakeholders during the integration (Adams & Neely, 2000).

Paulson and Huber (2001) also describe a possible M&A process with more focus on pre-deal activities. In the same way, Langford and Brown (2004) adapted the process based on top performers on the merger market. They have investigated the acquisition processes of BNP, Amoco, Exxon etc. and have generalised their actions taken. Galpin and Hendon (2014) have continuously adapted their approach for a process model. The latest model, consisting of eight steps, is based on years of experience in M&A expertise (Galpin, 2014).

To sum up, the most crucial stages are strategical planning, evaluation, negotiation and integration. Especially, pre-deal activities seem to predetermine the odds of success and failure of acquisitions. Several studies have already tried to improve PMI measures, whereas research about pre-deal adaptations has not delivered any constant solutions (D. N. Angwin & Meadows, 2014; Larsson & Finkelstein, 1999; Weber & Tarba, 2011; Zaheer et al., 2011). This gap has already led to disastrous mergers as many corporations had to face high write-offs.

As aforementioned, only in 2014 a first model for pre-deal decision support has been developed. Garzella and Fiorentino (2014) identify four crucial factors that need to be known to realise synergies after closing:

- Category of Synergy
 - Timing of Synergy
 - Size of Synergy
 - Likelihood of Synergy

Garzella and Fiorentino (2014) state the category of a synergy determines its other factors and has the most influence on a successful merger. Size and likelihood also depend on timing in respect of the time frame between closing and realising the deal. The size decreases relatively

to the time passing between deal closing and its realisation as well as the likelihood. So the type of synergy and its requirements for realisation determines the time frame for realisation.

As the category of synergy seems to be most important Garzella and Fiorentino (2014) summarised different approaches for synergy categories. Among other approaches they found:

Goold and Campbell (1998) see synergies in sharing knowhow and tangible resources. Furthermore, they describe pooled negotiations power and coordinated strategies as synergy classifications (Goold & Campbell, 1998). Cost savings, revenue enhancements, process improvements, financial engineering and tax benefits are five other possible categories of synergies (Eccles et al., 1999). Only three types of synergies (cost-savings, revenue enhancements and financial synergies) have been identified by Robert F. Bruner (2002). Another category system provides operating synergies, financial synergies and dubious synergies (Damodaran, 2005). The latest approach contains two categories: collusion-based and efficiency-based synergies (Clougherty & Duso, 2011). Collusive synergies refer to the market power as competition is reduced by a merger. Prices and profits are increasing for all corporations at the market. Efficiency-based synergies refer to operating excellence, as resource-sharing opportunities occur when two corporations merge. However, the type of merger (horizontal or vertical merger) determines the possible synergies (Clougherty & Duso, 2011).

Any corporation is free to categorise their synergies as suitable. On the contrary, it is necessary to understand the concept of synergies itself. In general, any competitive advantage established by the combination of two corporations could be a synergy, if it is hard to copy (Sirower, 1997). It often occurs that management report synergies, which do not really exist: e.g. a simple addition of sale figures is not a real synergy. Only when the merger of two organisations leads to supplementary rise in sales, the requirements of a synergy are fulfilled (Chatterjee, 2007; Ficery et al., 2007; Garzella & Fiorentino, 2014; Goold & Campbell, 1998; Kode et al., 2003; Larsson & Finkelstein, 1999; Zaheer et al., 2011; Zhou, 2011). Management need to consider the golden rule of M&A, $2+2=5$, when they are going to report and announce possible synergies (Ahern & Weston, 2007).

A common mistake is to take synergies for granted, although they only represent possibilities. Action plans to materialise synergies are often neglected despite the fact that integration plans have been developed. Synergies should be a crucial part of integration plans (Early, 2004).

Additionally, acquirers tend to prioritise synergies bearing the highest value, ignoring some principle of cause and effect. Several deals are justified by cost savings amounting to millions of dollars, but fail to realise, as it is expected that they simply materialise by merging two corporations (R.F. Bruner & Levitt, 2009; Harrison et al., 1991).

Referring to timing, the integration speed plays an important role in research (D. Angwin, 2004; Bert et al., 2003). Literature states that the first 100 days after deal closing are crucial to realising synergies in their highest possible value (D. Angwin, 2004; Bert et al., 2003; Galpin, 2014). Management may not forget to plan the integration in an aligned and precise way. Galpin and Hendon (2014) recommend integrating with prudent speed. Bert et al. (2003) state two years after closing it is impossible to realise any synergies. Approx. 70-80% of synergies could be realised within twelve months, the following twelve months only give room to 20-30% of synergy value realisation (Bert et al., 2003). Another aspect of timing has been mentioned by Herd and McManus (2012). They claim the economic situation cannot decide on success or failure of M&A transactions as they have not identified any significant variances in the number of failed mergers during economic shocks and a stable economy (Herd & McManus, 2012). Various past M&A transactions show that further timing concepts should be considered in execution of M&As. Some cases reveal that other timing than integration speed or market timing has been a crucial factor predetermining the outcome of a deal. For example, the

management of Sony Pictures did not consider the needed resources to be available on time. Moreover, Quaker Oats apparently neglected any necessary measures for synergies to materialise, whereas Disney developed a strong synergy management process (Baptiste, 2002; R.F. Bruner & Levitt, 2009; Rukstad & Collis, 2009). Further cases revealed that more timing concepts need to be considered.

To conclude, besides the time frame for integration and its impact on success of M&As, no other concepts of timing were named in literature so far. In the broadest sense of word, the logical sequence the M&A process in its entirety might be seen as a timing concept.

Methodology

The foundation of this paper is an extensive literature review to take up new and ongoing trends in M&A. Readers shall gain a comprehensive overview about the latest state of the art. Peer-reviewed journals and certain books will serve as sources to accomplish this literature review.

Literature review identified many critical factors determining success or failure of M&A deals. Right motives (Arnold & Parker, 2009; Berkovitch & Narayanan, 1993; Trautwein, 1990), well captured synergies (Damodaran, 2005; Goold & Campbell, 1998; Harrison et al., 1991; Sirower, 1997) and a detailed M&A process (Galpin, 2014; Glaum & Hutzschenreuter, 2010; Haspeslagh & Jemison, 1991; Paulson & Huber, 2001) seem to be necessary to succeed and have been researched thoughtfully. Moreover, the integration speed has been investigated and identified as final crucial factor for success (D. Angwin, 2004; Bert et al., 2003; Homburg & Bucerius, 2006). Garzella and Fiorentino (2014) furthermore identified that the type of synergy determines the time for a synergy to materialise. However, other concepts of timing seem to have been neglected in research and have not been explicitly researched. This paper asks “*Which concepts of timing do have a crucial impact on the M&A process?*”

In order to answer this question a qualitative meta-analysis has been chosen as method. In a meta-analysis results of primary research get investigated from a new point of view (secondary research). Data of primary research are case studies about past mergers in peer-reviewed journals covering organisational, HR, managerial and strategical issues. Further cases were obtained from Bruners book “Deals from Hell”, a collection of failed and successful mergers (R.F. Bruner & Levitt, 2009). The author has chosen this book as it contains an extensive collection of past M&A transactions which have been investigated in-depth. Furthermore, Robert F. Bruner has a wealth experience on this research agenda as he has dealt with more than 400 case studies and consulted several M&A transactions (R.F. Bruner & Levitt, 2009).

All in all, 30 cases have been investigated considering mergers since 1968. These cases are split equally in successful and failed mergers to avoid any bias. As the U.S mergers do have the highest share in merger market, most cases are U.S mergers but also European and Asian transactions are included. Furthermore, cross border transactions are also part of this meta-analysis. Different industries are represented within the sample to avoid industry depending deviations and to enable a generalisation of the results. The cases not only include single transactions, but also acquisition programs of frequent acquirer. The cases of Renault – Volvo and Dynergy – Enron never ended up to a merger, as negotiations never led to an agreement between those parties. The single case studies are included in this papers bibliography. These cases are further supported by journals dealing with the execution of M&A deals.

Table 3. Collection of Cases

No.	Acquirer – Target	Outcome	Reference
1	Pennsylvania – NY Railroad	F	Bruner (2009)
2	Sony Pictures- Columbia Pictures	F	Bruner (2009)
3	ATT – NCR	F	Bruner (2009)
4	HP – Compaq	F	Bruner (2009)
5	Quaker Oats – Snapple	F	Bruner (2009)
6	Mattel – TLC	F	Bruner (2009)
7	AOL – Time Warner	F	Bruner (2009)
8	Tyco International	F	Bruner (2009)
9	Aladdin – FAST	F	Weber & Tarba (2011)
10	BNP, Comcast, Renault, Alcoa, General Dynamics	S	Langford & Brown (2004)
11	Daimler – Chrysler	F	Finkelstein (2002)
12	Vodafone - Mannesmann	F	Halsall (2008)
13	BMW – Rover	F	Halsall (2008)
14	Renault – Volvo	F	Bruner (2009)
15	Dynegy - Enron	F	Bruner (2009)
16	Unilever - Bestfood	S	Bruner (2009)
17	Smucker - JIF	S	Bruner (2009)
18	Smucker - Crisco	S	Bruner (2009)
19	IBM - Lotus	S	Bruner (2009)
20	AMC – General Cinema	S	Bruner (2009)
21	ACE - CARE	S	Baptiste (2002)
22	Yahoo! - Geocities	S	Bruner (2009)
23	Yahoo! – Broadcast.com	S	Bruner (2009)
24	Deutsche Bank – Bankers Trust	S	Holland & Salama (2010) Salama et al. (2003)

Table 3. Collection of Cases

No.	Acquirer – Target	Outcome	Reference
25	BP - Amoco	S	Holland & Salama (2010) Salama et al. (2003)
26	Ford – Volvo	S	Holland & Salama (2010) Salama et al. (2003)
27	Fujisava - Yamanouchi	S	Shibayama et al. (2011)
28	Disney - ABC	S	Rukstad & Collis (2009)
29	Berkshire Hathaway - GEICO	S	Calandro et al. (2007)
30	Exxon - Mobil	S	Caiazza et al. (2013)

First, the case studies were read for overall understanding. Already existing research about timing concepts were first indications to identify timing issues. Furthermore, all data were investigated and transformed into meaningful units referring to timing concepts and subsequently coded based up on the approach of Denzin and Lincoln (2003). The author has not considered market timing as timing concept as it is seen as acquisition strategy. The identified timing concepts are illustrated in table 4.

Table 4. Search Strategy Framework

Explicit investigated	by	Discovered in Metastudy
Integration speed	Bert, MacDonald and Herd (2003)	Point of time
Synergy type determines point of time to materialise	Garzella and Fiorentino (2014)	Duration
Sequence of M&A process		Sequences
		Chronology
	Various sources	Frequency
		Time Frame

In the next step it was listed when one of these timing concepts influenced the odds of success or failure of a transaction. This list contained 131 mentions of timing concept impacts. Invariant constituents were identified by elimination of overlapping statements. Next, these invariant structures were used as foundation to build meaningful units. The transformation into meaningful units and coding took place in a multi-coder, recursive and iterative process with the following apriori code manual (Denzin & Lincoln, 2003). To illustrate the invariant structures the author provides table 5.

Table 5. Examples for invariant structures and their meaningful units

Invariant Structures	Meaningful Units
Due to industrial trends a merger was the only way to keep track of competition.	Urge to merge
After closing, operating was not possible due to the lack of resources.	Resources need to be available for operating merger
The focus on pre-deal activities is one essential reason for the success of the merger.	Duration of pre-merger activities
There was no plan for integration, two businesses without integrated processes worked simultaneously and many errors occurred.	Alignment of separate M&A process steps
Internal activities can be managed by M&A team.	Timeframe between first offer and deal closing
Even if it is aimed to acquire as frequently as possible, a needed timeframe to focus on single transactions is needed.	Time frame between single acquisitions
Chance to withdraw in due diligence is avoided as managers do not want to accept failure.	Find the right exit just at the moment
Managers need to weight restructuring costs against a divestiture with loss.	Save ailing investment

Finally, the meaningful units were clustered and summarised in six themes describing timing concepts with impact on the M&A process. Table 6 illustrates three examples of the identified main themes.

Table 6. Example for Themes

Themes	Meaningful Units
Duration of M&A Process in its entirety	External factors lengthen the M&A process
	No limit for duration of M&A process
	Sufficient time spent on single stages
Sequences of M&A Process	Alignment of separate M&A process stages
	Resources need to be available for operating merger
	Product pipeline need to be in flow
Synergy Chronology	Foundation of synergies is necessary
	Clear view about time frame for realisation of synergies
	Logical sequence of action plan to realise synergies

Findings

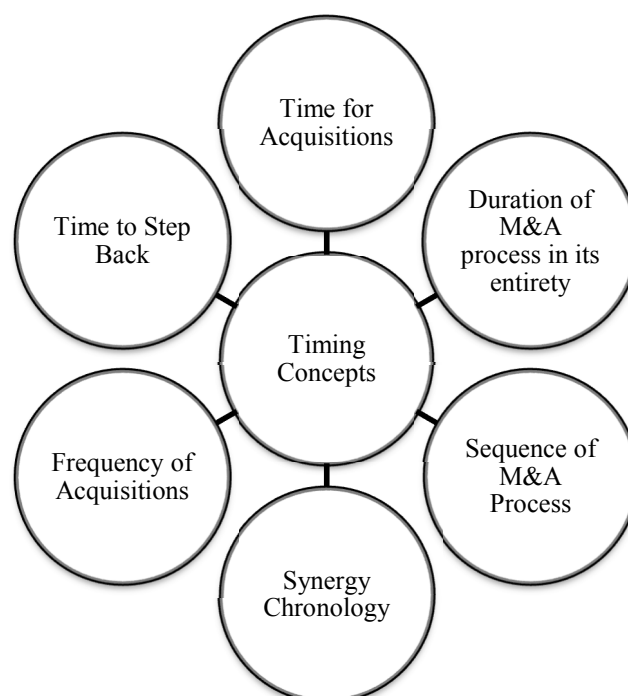


Figure 1: Overview Findings

Due to the combination of the identified timing concepts and elaborated meaning units six themes, in which timing concepts influence the M&A process, emerged: time for acquisitions, duration of M&A process in its entirety, sequences of M&A process, synergy chronology, frequency of acquisitions and time to step back. These concepts might have a crucial impact

on the odds of success or failure for M&A transactions. These six themes will be further elaborated in the following paragraphs, followed by a discussion in relation to the extensive literature review.

Time for Acquisitions

The point of time for mergers is an essential factor determining success or failure of transactions only partly. A common question is, whether it is wise to invest during economic troubled times, even if the whole market or even just the industry is impacted. The investigated cases show that the economic situation does not predetermine the outcome of transactions. Moreover, it seems that the economic situation might urge corporations to merge. In some industries it might be inevitable to merge due to competitive pressure, industry and technology trends.

Case 30: When a rash of nationalization of oil assets took place in the 1970s and 1980s, mergers and acquisitions (M&A) such as Shell-Belridge and Mobil-Superior Oil become necessary to ensure access to sufficient resources.

Case 6: As of late 1998, the toy industry was in the midst of profound change due to shifting competitive power, technological innovation, and fluctuations in consumer demand.

A far more challenging situation occurs, when the partying corporations additionally have to face bankruptcy due to economic shocks. Afterwards, it is necessary to operate at a minimal level of costs and mergers are a possibility to enable such a performance. AMC and General Cinema have merged to survive after bankruptcy. As both corporations did not have to deal with any time pressure, they were able to plan extensively and saw a chance in a struggled industry.

Generally, the failure of other corporations in the same industry might highlight the point of time or the best chance for acquisitions.

Case 30: Following its acquisition, the firm clearly benefited from the collapse of reckless competitors like Enron, [...]

It is very important to find the right point of time for acquisitions to avoid any time pressure in carrying out the merger. If a merger is seen as the only way to avoid bankruptcy there might be a lot of pressure for the merger to succeed. Moreover, due to this haste many errors might occur during essential evaluations.

Case 15: The stress of time urgency and crisis condition can only have weakened the ability of the operating team of decision makers at the scene.

Case 6: But it also appears that Mattel's due diligence research on TLC was inadequate, which, combined with the apparent haste to do a deal, increased the probability that Jill Barad did not understand the risks in TLC.

Summed up, a troubled economic situation of the whole market, industry or even on the corporation level, may not determine the odds of success or failure of a merger. However, it might definitely determine the point of time for acquisitions. It may be that it is not possible to choose the point of time freely, as industry, technology and competitive trends are a deciding factor. Nevertheless, it should not be seen as a threat to merge as rapid as possible. The point of time needs to be chosen wisely, to capture all chances correctly. Moreover, the point of time for acquisitions should be set as early as possible to avoid any time pressure in its execution.

Duration of M&A process in its entirety

All in all, the duration of the whole process is not a significant factor in deciding on the outcome of a merger. There is no constant timeframe determining successful and failed mergers. Transactions with an entire timeframe of only two years failed, but mergers with duration of six years succeeded.

On the contrary, the duration of the single stages play a way more important role. The time spent on due diligence, pre-deal activities in general, and negotiations might decide about the success or failure of a transaction. Generally, pre-deal activities are a very time consuming activity, but it seems they are worth the effort. Moreover, pre-deal activities need to be considered as foundation for further decisions.

Case 21: The extended time frame is one. In this merger, the staff of both banks, and of CARE in particular, had a long period to make personal decisions. For the 3 years in which an ACE managing director ran CARE prior to the operational merger, staff had the opportunity to consider options and make decisions about their future in relatively stress free conditions.

Especially, an extensive due diligence might avoid time consuming and exhausting negotiations. In some cases negotiations exceeded a time frame of more than one year resulting in lost tracks of essential decisions in negotiations.

Case 9: Negotiations over the merger lasted about two years, and did not reach the point of individualized operative thinking until the final stages. [...] But there was no detailed planning of the implementation of post-merger integration, and there were no clear timelines.

Timeframes for due diligence and negotiations might be assessable by both corporations. Besides, there may occur “external” interruptions, which lengthen the duration of the whole M&A process. Most M&A transactions need to be approved by antitrust divisions or competition authority. Depending on the industry these processes might take three to ten years. It is very important not to neglect the impact of such delays and to develop action plans to overcome them.

Case 1: The ICC was notoriously slow in its process of reviewing merger-applications [...] Delay bred internal indecision in the merging firms, which when combined with the growing impatience of shippers and the inflexibility of labor unions to accommodate changes in work rules, neutered the hoped-for cost savings, productivity improvements, and revenue growth.

In sum, a golden rule for a success granting duration of a M&A transaction seems not to exist. For example, a transaction is not damned to fail if it took more than two years to execute it. On the other hand, there is no guarantee for success if it took only one year for a merger to be executed. It is more important to focus on the single stages of the M&A process. It is wiser to invest more time in extensive pre-deal activities and respect any aspect of the transaction in the beginning. As a result, it is not needed to spend more time than necessary on negotiations and subsequent works.

Sequence of M&A process

Beside the time invested in the separate stages, the sequence alignment of these stages seems to be crucial as it apparently predetermines the outcome of transactions. Most of the cases investigated state that it is necessary to depart from the traditional sequence, where integration is firstly considered after closing.

Several M&A transactions have primarily succeeded as they started with integration tasks already in pre-deal activities. Corporations investigated in this paper tend to include integration in due diligence, which might be a crucial success factor. An integration due diligence could include different analysis to gather information about challenges in organisational and cultural integration. Integration should be seen as a process stage, starting at due diligence to avoid any kind of surprises after deal closing. As several cases show, most mergers have failed as cultural hurdles have not been considered on time, resulting in missing commitment of staff. Additionally, it is important to know in advance all obligations that need to be met after closing.

Case 24: During the due-diligence period, DB top management decided to undertake a cultural assessment exercise. [...] The cultural awareness exercise disclosed that DB employees were not satisfied with the deal. [...] Better communication to the employees on the rationale and validity of the acquisition process was implemented.

Case 5: [...] explained that Snapple's independent distributors simply wouldn't accept the proposed swap of Gatorade distribution for direct supermarket access [...] The co-packing contracts had also locked Snapple into unrealistic production levels with the independent suppliers.

Moreover, it is necessary to link the separate stages in a way to avoid any delays in the product, process, technology, and etc. pipeline. The cases show that several M&A transactions have failed as they were not able to operate after closing due to the mismanagement of the M&A process.

Case 5: And Snapple itself had no new products in the pipeline, and no new advertising or promotions on the way. Finally, Quaker had been too slow to respond to the problems in the unit.

Case 11: As a result, Chrysler sat in apathy, waiting for Daimler's next move - a move which came too late -- eleven months after Eaton's retirement -- when Schrempp installed a German management team on November 17, 2000. During that interval, Chrysler bled cash. [...] Chrysler responded with little innovations, and competitive price reductions only began in Q2 2001. Its traditional dominance in the SUV and light truck market had been challenged, and it had not adequately responded.

As a result, the linking of the sequences and the sequences themselves might definitely decide about the success or failure of a M&A process. Corporations dealing with M&A process should consider the integration as an ongoing process starting at due diligence. Moreover, they need to keep track of all actions necessary to guarantee a smooth operating after deal closing. Any time lost in subsequent work after deal closing might reduce the time frame needed to realise possible synergies and enhance shareholder value.

Synergy chronology

The study revealed that often deals only get justified by cost or revenue benefits. In only a few deals the focus is set on necessary actions to realise these synergies, as a logical chronology of synergies is generally neglected. At first, it is important to reach for synergies which are absolutely achievable to materialise.

Technically, cost or revenue benefits are only the result of realised synergies. Synergies themselves should rather be seen as an optimised operation of HR, technology, processes and knowhow within a corporation.

Especially, the commitment of HR needs to be considered as the foundation of all synergies, as staff have to make use of technology, processes and knowhow. It is necessary to focus on this synergy at first.

Case 28: According to Eisner, the key to Disney's synergy was Disney Dimensions, a program held every few months for 25 senior executives from every business. [...] When they go back to their jobs, what happens is synergy, naturally.

If the commitment of HR on both sides is established, it is possible to work on other synergies concerning processes, technology and knowhow.

Case 26: In terms of technology transfer, immense opportunities for synergy are foreseen by both parties. Volvo engineers visit US plant in order to offer US engineers knowledge, primarily on safety and ergonomics. [...] These synergies are perceived by employees from both companies as very positive outcomes from the acquisition process.

The timeframe needed for synergies to materialise is also an important component of the synergy chronology. Corporations have to consider that the realisation of synergies is an ongoing process, requiring further investments and efforts. The cashflow timeline of synergies is characterised by a necessary amount of outflows to achieve an even higher income.

Case 1: The accelerated capital spending and operational problems worsened the flow of cash. As the Securities and Exchange Commission (SEC) later reported, the adverse cash impact of the merger was "grossly underestimated" by management.

To conclude, the chronology of synergies and its dynamic play an immense role in the M&A process and its outcome. It is recommended not to just focus on the possible results, cost or revenue benefits. It is far more important to get an overview of all synergies and the required actions to realise them. The establishment of a time schedule for synergies would be a possibility to track synergies and the latest actions taken. Additionally, to really succeed in realising synergies, the HR commitment should be considered as synergy itself and beyond that as the fundamental synergy to enable process, technology or knowhow synergies.

Frequency of Acquisitions

The frequency of acquisitions might have an important impact on the outcome of mergers. First of all, corporations have the possibility to gain experience and improve their learning curve through frequent acquisitions. On the contrary, it is necessary to consider that the learning curve effect might only affect parts of the M&A process as no M&A transaction resembles the other one.

Case 10: Buying often moves companies down the negotiation and integration learning curves.

Various acquisition programs state specific criteria that need to be met, to avoid any hasty deals. In some cases acquisitions are the foundation of growth within a corporation so they intend to increase the number of deals per year. Accordingly, they might neglect a certain timeframe needed to execute every single deal. As a result, they lose focus and have to face high write-offs as integration and realisation of synergies failed.

To conclude, the challenge is to find a frequency for transactions that allow a stable potential for growth and a timeframe to focus on essential stages of the M&A process for every single transaction. Only then, a corporation might benefit from learning curve effects partially.

Time to step back

In some cases, corporations need to face the point of time where it would be wiser to step back from a deal. There might be new information, unexpected developments or other surprises discouraging the acquiring party. The first possibility of such a point of time would be during or after due diligence activities, when all information is available to make a proper decision. However, corporations tend to ignore this possibility due to various reasons.

Surprisingly, the decision following due diligence, namely the decision to continue with or withdraw from the initial intent of acquiring a target firm as a result of new information uncovered during due diligence, has been relatively neglected (Puranam et al., 2006).

Even if escape clauses are linked with back out charges; their scope could hardly catch up with the dimension of necessary write-offs, extra cash – outflows and other expenditures connected with failed M&A mergers.

If corporations move on with their deals, and the merger did not work out as expected, they need to face the point of time where the only way to survive is to let go. In many cases, failed mergers result in spin-offs, where they have to sell their initial target with loss. Consequently, they might reduce the expenditures for an unsuccessful restructuring project of the merger if they divest on time.

Case 6: [...] The board had estimated that a turnaround of TLC would take two years, a length of time they refused to endure.

It is obvious that this point of time does not enhance the chance of success, but it may be a crucial timing concept deciding about the dimensions of a failed M&A transaction. Considering a volatile economic environment and the bad publicity of a failed M&A deal, a disposal of the target might be the only chance for an effective damage control. More to the point, corporations need to take any doubts arising during due diligence seriously. They could be able to choose the point of time for withdrawal as soon as possible and reduce any losses to its minimum.

Discussion

Generally, research has tried to identify certain starting points, which may decide about success or failure. There have been different approaches investigating motives (Arnold & Parker, 2009; Berkovitch & Narayanan, 1993; Nguyen et al., 2012; Trautwein, 1990), synergies (Chatterjee, 2007; Damodaran, 2005; Ficery et al., 2007; Garzella & Fiorentino, 2014; Goold & Campbell, 1998; Kode et al., 2003), PMI (Adams & Neely, 2000; D. N.

Angwin & Meadows, 2014; Datta, 1991; Joseph, 2014; Weber et al., 2012), evaluation methods (Ahammad & Glaister, 2013; Calandro et al., 2007; Kode et al., 2003) etc. Referring to timing concepts, only speed has been investigated in more detail, stating that there is a limited time frame to realise synergies after closing (D. Angwin, 2004; Bert et al., 2003). Another timing concept briefly mentioned in research is the economic situation (Herd & McManus, 2012). Herd et al. (2012) say that the economic situation does not influence the outcome of a transaction. Other aspects of timing have not arisen yet.

The findings of this empirical study reveal that there may be another starting point deciding about the odds of success or failure of M&A deals: the timing concepts identified in this paper. Corporations should consider other timing concepts than integration speed, to higher their chances for value enhancement. On the first sight, the timing concepts identified in this paper are no world-changing epiphany. However, the cases have shown that these timing concepts may be worth considering as they might predetermine the outcome of M&A transactions.

In the next paragraphs the author is trying to point out where these timing concepts might have already arisen in research and where they might be a valuable adaption of existing theory.

Actually, the timing concept of sequence of the M&A process has always been staring in the face of various authors and researchers. They adapted the separate stages of this process by splitting some stages or extending their scope due to new insights in practical approaches (Galpin, 2014; Glaum & Hutzschenreuter, 2010; Haspeslagh & Jemison, 1991; Paulson & Huber, 2001); however, none of them have considered rearranging the single stages themselves. The cases show that some corporations see integration as a part of due diligence activities, but this approach has never been depicted in literature so far.

The time for acquisition in respect of the economic situation has always been seen as a risk factor (Bert et al., 2003; Herd & McManus, 2012). The findings in this paper show that a merger might be a chance to overcome economic shocks. Moreover, the economic situation might force corporations to merge due to limited grow potentials, hard competition and lacking resources (Rovit et al., 2004).

Types of synergies have been highly discussed in literature (Chatterjee, 1986; Damodaran, 2005; Goold & Campbell, 1998; Harrison et al., 1991). Garzella and Fiorentino (2014) say that it is essential to know the type of a synergy initially; otherwise it is not possible to manage them properly. A logical sequence to make synergies to materialise even possible has not been considered in literature so far. Although, the cases show that it is a trip hazard to ignore it.

To sum up, evidence points towards that the sequence of the M&A process, the time of acquisitions and the synergy chronology might have the strongest impact on the outcome of a M&A deal as they affect all corporations dealing with business transactions. Acquirers should avoid neglecting their importance and try to manage them as well as possible. Whereas, the frequency of acquisitions only refers to experienced acquirer, the duration of a deal execution varies from case to case and the time to step back is considered as emergency exit.

Conclusion

This paper is set out to identify further timing concepts and their impact on the outcome of M&A transactions, besides market timing and integration speed. In order to detect any timing concepts a qualitative meta-analysis has been conducted. 30 cases of past mergers have been investigated for any codes that are highlighting timing concepts by the approach of Denzin and Lincoln (2003) revealing six themes:

- Time for acquisitions
- Duration of M&A process in its entirety
- Sequence of M&A process
- Synergy chronology
- Frequency of acquisitions
- Time to step back

Referring to the literature, the author identifies a gap regarding the approach of these timing concepts. Corporations need to consider the right time for acquisitions to avoid any time pressure but maintain advance at the market. Sufficient time needs to be invested without getting in the way of the efficiency of a M&A process. The single stages should be sequenced just in time to enable a smooth workflow after closing. As synergies are the main source for value enhancement, any corporation should be aware of a given synergy chronology. Cost or revenue benefits do not materialise out of nothing and need a stable foundation: HR commitment. It is a synergy enabling process, technology and knowhow strategies resulting in any kind of benefits. Frequent acquirer might gain experience from their transactions if they still have time to focus on every single transaction to learn from it. However, the learning curve effect is limited, as each deal is unique. Corporations need to be brave enough to withdraw if surprises arise during due diligence. This is the only point of time where they can step back at a minimal expense. If the deal fails after closing, corporations have to think for a time to step back with the smallest possible loss and write-offs.

These timing concepts have been neglected in literature so far. Several cases have shown early evidence that they might be an important factor predetermining the outcome of M&A transactions. Disney flourished as they apparently understood their synergy chronology; whereas Quaker Oats failed due to lack of knowledge of necessary arrangements to make synergies even possible (R.F. Bruner & Levitt, 2009; Rukstad & Collis, 2009). The fusion of Daimler and Chrysler had no chance as due diligence did not cover up cultural aspects. The due diligence activities of Deutsche Bank included cultural investigations, so they were able to prepare for any hurdles in advance (Caiazza et al., 2013). None of these timing aspects have been considered in research so far, resulting in a gap.

To conclude, as far as the author knows, this paper is a first approach to close this gap as it points out further aspects of timing that need to be taken into account in M&A transactions. These concepts have always been present but have not been investigated in detail, although their impact seems to be irrefutable. Especially, the sequence of the M&A process should be set more into focus of future research. As several cases have shown, the M&A process is a complex and interactive system and it is not recommended to always follow the traditional approaches mentioned in the literature. This paper suggests future research to focus on how to manage the timing of interlocking the single stages. Moreover, the overlap of certain stages should be considered to maintain a smooth workflow. An important question for research is which integration activities are possible in practice before closing as part of pre-deal activities. Besides, a synergy chronology should be a further topic considered in future research. As several cases have proved, only titling synergies is not the way to realise them. Moreover, corporations need to understand the cause and effect dynamic behind synergies to meet the required measures. These two timing concepts are directly managed by corporations and seem to influence the outcome of a transaction with the highest extent. As a result, they should hold priority positions in future M&A research.

References

- Adams, C., & Neely, A. (2000). The performance prism to boost M&A success. *Measuring Business Excellence*, 4(3), 19-23. doi: 10.1108/13683040010377818
- Ahammad, M. F., & Glaister, K. W. (2013). The pre-acquisition evaluation of target firms and cross border acquisition performance. *International Business Review*, 22(5), 894-904. doi: 10.1016/j.ibusrev.2013.01.001
- Ahern, K. R., & Weston, F. J. (2007). M&As: The Good, the Bad, and the Ugly. *Journal of Applied Finance*, 17(1), 5-20.
- Angwin, D. (2004). Speed in M&A Integration:: The First 100 Days. *European Management Journal*, 22(4), 418-430. doi: http://dx.doi.org/10.1016/j.emj.2004.06.005
- Angwin, D. N., & Meadows, M. (2014). New Integration Strategies for Post-Acquisition Management. *Long Range Planning*. doi: 10.1016/j.lrp.2014.04.001
- Arnold, M., & Parker, D. (2009). Stock market perceptions of the motives for mergers in cases reviewed by the UK competition authorities: an empirical analysis. *Managerial and Decision Economics*, 30(4), 211-233. doi: 10.1002/mde.1445
- Auerbach, A., & Reishus, D. (1988). *The Impact of Taxation on Mergers and Acquisitions* (Vol. 20): University of Chicago Press.
- Baptiste, R. G. (2002). The Merger of ACE and CARE: Two Caribbean Banks. *The Journal of Applied Behavioral Science*, 38(4), 466-480. doi: 10.1177/002188602237792
- Barnes, P. (1998). Why do Bidders do badly out of Mergers? Some UK evidence. *Journal of Business Finance & Accounting*, 25(5), 571-594.
- Berkovitch, E., & Narayanan, M. P. (1993). Motives for Takeovers: An Empirical Investigation. *The Journal of Financial and Quantitative Analysis*, 28(3), 347-362. doi: 10.2307/2331418
- Bert, A., MacDonald, T., & Herd, T. (2003). Two merger integration imperatives: urgency and execution. *Strategy & Leadership*, 31(3), 42-49. doi: 10.1108/10878570310472755
- Bild, M., Guest, P., Cosh, A., & Runsten, M. (2002). Do takeovers create value? A residual income approach on UK data *ESRC Centre for Business Research - Working Papers*: ESRC Centre for Business Research.
- Bradley, M., Desai, A., & Kim, E., Han. (1988). Synergistic gains from corporate acquisitions and their division between the stockholders of target and acquiring firm. *Journal of Financial Economics*, 21, 3-40.
- Bruner, R. F. (2002). Does M&A pay? A survey of Evidence for the Decision Maker *Journal of Applied Finance*, 12(1 Spring/Summer), 48-68.
- Bruner, R. F., & Levitt, A. (2009). *Deals from Hell: M&A Lessons that Rise Above the Ashes*: Wiley.
- Caiazza, R. (2014). Factors affecting spin-off creation. *Journal of Enterprising Communities: People and Places in the Global Economy*, 8(2), 103-110. doi: 10.1108/jec-12-2012-0061
- Caiazza, R., Audretsch, D., Volpe, T., & Debra Singer, J. (2014). Policy and institutions facilitating entrepreneurial spin-offs: USA, Asia and Europe. *Journal of Entrepreneurship and Public Policy*, 3(2), 186-196. doi: 10.1108/jep-04-2013-0013
- Caiazza, R., Hsieh, W., Tiwari, M., & Topf, D. (2013). M&A between giants: the fastest way to dominate the world economy. *Foresight*, 15(3), 228-239. doi: 10.1108/fs-01-2012-0003
- Caiazza, R., & Volpe, T. (2015). M&A process: a literature review and research agenda. *Business Process Management Journal*, 21(1), 205-220. doi: 10.1108/bpmj-11-2013-0145
- Calandro, J., Dasari, R., & Lane, S. (2007). Berkshire Hathaway and GEICO: an M&A case study. *Strategy & Leadership*, 35(6), 34-43. doi: 10.1108/10878570710833741
- Cartwright, S., & Schoenberg, R. (2006). Thirty Years of Mergers and Acquisitions Research: Recent Advances and Future Opportunities. *British Journal of Management*, 17(S1), S1-S5. doi: 10.1111/j.1467-8551.2006.00475.x
- Chatterjee, S. (1986). Types of Synergy and Economic Value: The Impact of Acquisitions on Merging and Rival Firms. *Strategic Management Journal*, 7(2), 119-139.
- Chatterjee, S. (2007). Why is synergy so difficult in mergers of related businesses? *Strategy & Leadership*, 35(2), 46-52. doi: 10.1108/10878570710734534
- Clougherty, J. A., & Duso, T. (2011). Using rival effects to identify synergies and improve merger typologies. *Strategic Organization*, 9(4), 310-335. doi: 10.1177/1476127011421536
- Damodaran, A. (2005). The Value of Synergy *Stern School of Business*, October 2005.
- Das, A., & Kapil, S. (2012). Explaining M&A performance: a review of empirical research. *Journal of Strategy and Management*, 5(3), 284-330. doi: 10.1108/17554251211247580
- Datta, D. K. (1991). Organizational fit and acquisition performance: Effects of post-acquisition integration. *Strategic Management Journal*, 12(4), 281-297. doi: 10.1002/smj.4250120404
- Demirakos, E. G., Strong, N. C., & Walker, M. (2004). What Valuation Models Do Analysts Use? *Accounting Horizons*, 18(4), 221-240. doi: doi:10.2308/acch.2004.18.4.221

- Denzin, N. K., & Lincoln, Y. S. (2003). *Collecting and Interpreting Qualitative Materials*: SAGE Publications.
- Dobbs, R., Huyett, B., & Koller, T. (2009). Are you still the best owner of your assets? *McKinsey Quarterly*.
- Dong, M., Hirshleifer, D., Richardson, S., & Teoh, S. H. (2006). Does Investor Misvaluation Drive the Takeover Market? *The Journal of Finance*, 61(2), 725-762. doi: 10.1111/j.1540-6261.2006.00853.x
- Early, S. (2004). New McKinsey research challenges conventional M&A wisdom. *Strategy & Leadership*, 32(2), 4-11. doi: 10.1108/10878570410699069
- Eccles, R. G., Kersten, L. L., & Thomas, C. W. (1999). Are You Paying Too Much for That Acquisition? *Harvard Business Review*, 77(4), 136-146.
- Epstein, M. J. (2005). The determinants and evaluation of merger success. *Business Horizons*, 48(1), 37-46. doi: <http://dx.doi.org/10.1016/j.bushor.2004.10.001>
- Ficery, K., Herd, T., & Pursche, B. (2007). Where has all the synergy gone? The M&A puzzle. *Journal of Business Strategy*, 28(5), 29-35. doi: 10.1108/02756660710820802
- Finkelstein, S. (2002). The DaimlerChrysler Merger. *Trustees of Dartmouth College*.
- Furlan, A., & Grandinetti, R. (2014). Spin-off performance in the start-up phase – a conceptual framework. *Journal of Small Business and Enterprise Development*, 21(3), 528-544. doi: 10.1108/jsbed-04-2014-0055
- Galpin, T. J. (2014). *The Complete Guide to Mergers and Acquisitions: Process Tools to Support M&A Integration at Every Level*: Wiley.
- Garzella, S., & Fiorentino, R. (2014). A synergy measurement model to support the pre-deal decision making in mergers and acquisitions. *Management Decision*, 52(6), 1194-1216. doi: 10.1108/md-10-2013-0516
- Gates, S., & Very, P. (2003). Measuring Performance During M&A Integration. *Long Range Planning*, 36(2), 167-185. doi: [http://dx.doi.org/10.1016/S0024-6301\(03\)00004-9](http://dx.doi.org/10.1016/S0024-6301(03)00004-9)
- Ghosh, A., & Jain, P. C. (2000). Financial leverage changes associated with corporate mergers. *Journal of Corporate Finance*, 6(4), 377-402. doi: [http://dx.doi.org/10.1016/S0929-1199\(00\)00007-9](http://dx.doi.org/10.1016/S0929-1199(00)00007-9)
- Glaum, M., & Hutzschenreuter, T. (2010). *Mergers & Acquisitions: Management des externen Unternehmenswachstums*: Kohlhammer.
- Goedhart, M., Koller, T., & Wessels, D. (2010). The five types of successful acquisitions. *McKinsey on Finance*, 36.
- Gogan, J. L., Baxter, R. J., Boss, S. R., & Chircu, A. M. (2013). Handoff processes, information quality and patient safety. *Business Process Management Journal*, 19(1), 70-94. doi: [doi:10.1108/14637151311294877](http://dx.doi.org/10.1108/14637151311294877)
- Goold, M., & Campbell, A. (1998). Desperately Seeking Synergy *Harvard Business Review*(September - October 1998).
- Gruca, T. S., Nath, D., & Mehra, A. (1997). Exploiting synergy for competitive advantage. *Long Range Planning*, 30(4), 481-611. doi: [http://dx.doi.org/10.1016/S0024-6301\(97\)00039-3](http://dx.doi.org/10.1016/S0024-6301(97)00039-3)
- Halsall, R. (2008). Intercultural Mergers and Acquisitions as 'Legitimacy Crises' of Models of Capitalism: A UK—German Case Study. *Organization*, 15(6), 787-809. doi: 10.1177/1350508408091003
- Harrison, J. S., Hitt, M. A., Hoskisson, R. E., & Ireland, R. D. (1991). Synergies and Post-Acquisition Performance: Differences versus Similarities in Resource Allocations. *Journal of Management*, 17(1), 173.
- Haspeslagh, P. C., & Jemison, D. B. (1991). *Managing Acquisitions: Creating Value Through Corporate Renewal*: Free Press.
- Healy, P. M., Palepu, K. G., & Richard, S. R. (1992). Does Corporate Performance Improve after Mergers? *Journal of Financial Economics*, 21(2), 135-175.
- Herd, T. J., & McManus, R. (2012). Who says M&A doesn't create value? *Outlook - The Journal of high-performance business*(1).
- Hitt, M. A. (2000). The new frontier: Transformation of management for the new millennium. *Organizational Dynamics*, 28(3), 7-17. doi: [http://dx.doi.org/10.1016/S0090-2616\(00\)88446-6](http://dx.doi.org/10.1016/S0090-2616(00)88446-6)
- Hodgkinson, L., & Partington, G. H. (2008). The motivation for takeovers in the UK. *Journal of business finance & accounting : JBFA*, 35(1/2, (1/3)), 102-126.
- Holland, W., & Salama, A. (2010). Organisational learning through international M&A integration strategies. *The Learning Organization*, 17(3), 268-283. doi: 10.1108/09696471011034946
- Homburg, C., & Bucerius, M. (2006). Is speed of integration really a success factor of mergers and acquisitions? An analysis of the role of internal and external relatedness. *Strategic Management Journal*, 27(4), 347-367. doi: 10.1002/smj.520
- Joseph, J. (2014). Managing change after the merger: the value of pre-merger ingroup identities. *Journal of Organizational Change Management*, 27(3), 430-448. doi: [doi:10.1108/JOCM-10-2013-0184](http://dx.doi.org/10.1108/JOCM-10-2013-0184)
- Kengelbach, J., Roos, A., & Keienburg, G. (2014). Don't miss the exit - Creating shareholder value through divestitures. *The Boston Consulting Group*, September 2014.

- Kode, G. V. M., Ford, J. C., & Sutherland, M. M. (2003). A conceptual model for evaluation of synergies in mergers and acquisitions: A critical review of the literature. *South African Journal of Business Management*, 34(1), 27.
- Langford, R., & Brown, C. (2004). Making M&A pay: lessons from the world's most successful acquirers. *Strategy & Leadership*, 32(1), 5-14. doi: 10.1108/10878570410511372
- Larsson, R., & Finkelstein, S. (1999). Integrating Strategic, Organizational, and Human Resource Perspectives on Mergers and Acquisitions: A Case Survey of Synergy Realization. *Organization Science*, 10(1), 1-26. doi: doi:10.1287/orsc.10.1.1
- Marks, M. L., & Mirvis, P. H. (2011). Merge Ahead: A Research Agenda to Increase Merger and Acquisition Success. *Journal of Business & Psychology*, 26(2), 161-168. doi: 10.1007/s10869-011-9219-4
- Meglio, O., & Risberg, A. (2011). The (mis)measurement of M&A performance—A systematic narrative literature review. *Scandinavian Journal of Management*, 27(4), 418-433. doi: 10.1016/j.scaman.2011.09.002
- Mitchell, W., & Shaver, J. M. (2003). Who Buys What? How Integration Capability Affects Acquisition Incidence and Target Choice. *Strategic Organization*, 1(2), 171-201. doi: 10.1177/1476127003001002305
- Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2004). Firm size and the gains from acquisitions. *Journal of Financial Economics*, 73(2), 201-228. doi: 10.1016/j.jfineco.2003.07.002
- Morck, R., Shleifer, A., & Vishny, R. W. (1990). Do Managerial Objectives Drive Bad Acquisitions? *The Journal of Finance*, 45(1), 31-48. doi: 10.2307/2328808
- Nguyen, H. T., Yung, K., & Qian, S. (2012). Motives for Mergers and Acquisitions: Ex-Post market Evidence from the US. *Journal of Business Finance & Accounting*, 39(9), 1357-1375. doi: 10.1111/jbfa.12000
- Paulson, E., & Huber, C. (2001). *The Technology M&A Guidebook*: Wiley.
- Puranam, P., Powell, B. C., & Singh, H. (2006). Due diligence failure as a signal detection problem. *Strategic Organization*, 4(4), 319-348.
- Roll, R. (1986). The Hubris Hypothesis of Corporate Takeovers. *The Journal of Business*, 59(2), 197-216.
- Rovit, S., Harding, D., & Lemire, C. (2004). A simple M&A model for all seasons. *Strategy & Leadership*, 32(5), 18-24. doi: 10.1108/10878570410557624
- Rukstad, M. G., & Collis, D. (2009). The Walt Disney Company: The Entertainment King. *Harvard Business School*.
- Salama, A., Holland, W., & Vinten, G. (2003). Challenges and opportunities in mergers and acquisitions: three international case studies – Deutsche Bank-Bankers Trust; British Petroleum-Amoco; Ford-Volvo. *Journal of European Industrial Training*, 27(6), 313-321. doi: 10.1108/03090590310479947
- Schneider, B. W., Plakun, S., & Slooth, T.-F. (2009). Practitioner's Section: M&A since Y2K - An overview of chemical deals involving BRIC countries in the new millenium. *Journal of Business Chemistry*, 6(2), 97-105.
- Shibayama, S., Tanikawa, K., & Kimura, H. (2011). New perspective for the management of M&A process: a merger case of a Japanese pharmaceutical company. *Corporate Governance: The international journal of business in society*, 11(1), 77-89. doi: 10.1108/14720701111108862
- Shleifer, & Vishny, R. W. (2003). Stock market driven acquisitions. *Journal of Financial Economics*, 70(3), 295-311. doi: 10.1016/s0304-405x(03)00211-3
- Shleifer, A., & Vishny, R. W. (1989). Management entrenchment: The case of manager-specific investments. *Journal of Financial Economics*, 25(1), 123-139. doi: http://dx.doi.org/10.1016/0304-405X(89)90099-8
- Sirower, M. L. (1997). *The Synergy Trap: How Companies Lose the Acquisition Game*: Free Press.
- Svensson, P., Klofsten, M., & Etzkowitz, H. (2012). An Entrepreneurial University Strategy for Renewing a Declining Industrial City: The Norrköping Way. *European Planning Studies*, 20(4), 505-525. doi: 10.1080/09654313.2012.665616
- Tichy, G. (2001). What do we know about Success and Failures of Mergers? *Journal of Industry, Competition and Trade*, 1(4), 347-394.
- Trautwein, F. (1990). Merger motives and merger prescriptions. *Strategic Management Journal*, 11(4), 283-295. doi: 10.1002/smj.4250110404
- Wayne, H., & Alzira, S. (2010). Organisational learning through international M&A integration strategies. *The Learning Organization*, 17(3), 268-283. doi: 10.1108/09696471011034946
- Weber, Y., Rachman-Moore, D., & Tarba, S. Y. (2012). HR practices during post-merger conflict and merger performance. *International Journal of Cross Cultural Management*, 12(1), 73-99. doi: 10.1177/1470595811413111
- Weber, Y., & Tarba, S. (2011). Exploring integration approach in related mergers. *International Journal of Organizational Analysis*, 19(3), 202-221. doi: doi:10.1108/19348831111149178
- Zaheer, A., Castaner, X., & Souder, D. (2011). Synergy Sources, Target Autonomy, and Integration in Acquisitions. *Journal of Management*, 39(3), 604-632. doi: 10.1177/0149206311403152

- Zhou, Y. M. (2011). Synergy, coordination costs, and diversification choices. *Strategic Management Journal*, 32(6), 624-639. doi: 10.1002/smj.889
- Zollo, M., & Meier, D. (2008). What Is M&A Performance? *The Academy of Management Perspectives*, 22(3), 55-77. doi: 10.5465/amp.2008.34587995

Other References

- KPMG (2014): 2015 M&A Outlook Survey Report, downloaded 01/15/15
<http://www.execed.kpmg.com/content/PDF/kpmg-ma-outlook-2015-web.pdf>
- Ernst&Young (2014a): Global technology M&A update, Januray – March 2014, downloaded 11/04/14;
[http://www.ey.com/Publication/vwLUAssets/Global_technology_MandA_update-1Q14_highlights/\\$FILE/EY_1Q14_Global_technology_MandA_Report.pdf](http://www.ey.com/Publication/vwLUAssets/Global_technology_MandA_update-1Q14_highlights/$FILE/EY_1Q14_Global_technology_MandA_Report.pdf)
- Ernst&Young (2014b): Global technology M&A update, April – June 2014, downloaded 11/11/15;
[http://www.ey.com/Publication/vwLUAssets/EY-global-technology-m-and-a-update/\\$FILE/EY-global-technology-m-and-a-update.pdf](http://www.ey.com/Publication/vwLUAssets/EY-global-technology-m-and-a-update/$FILE/EY-global-technology-m-and-a-update.pdf)

EMERGING RISKS: A WAY FORWARD

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Abstract: *Emerging risks are new risks or are existing known risks. Existing ERM framework and capital models are developed to manage known arrays of risks that can potentially threaten earnings and profitability of the company. However, emerging risks by its nature are new risks or are not well understood, therefore have not been considered so far adequately.*

Emerging risks introduce volatility into companies' earnings; even can potentially transform the very nature of companies' business models. However, there is no or little preparedness to manage such risk. It's time to think out of conventional thought which cannot be applied for testing the impact of emerging risks against the business model. There is an urgent need to improve our existing ability and capabilities to detect, assess and respond to these risks, which can quickly develop into full-blown crises.

Emerging risks are evolving in uncertain ways, have been forgotten in their dormancy, or are new; typically do not have a well-defined distribution. They require more thought when modeling their impact. Ultimately, ERM and capital model should help in decision making that works well for long run and for full array of risks, known or unknown. These are challenges for Risk and Finance academicians; it will require more collaborative work to address emerging risks appropriately.

Keywords: *emerging risks, enterprise risk management, risk velocity, macro and micro economic factors.*

Introduction

Emerging risks can be defined as new risks expected to emerge in changing Geopolitical, Economic and Technological environment. These can be existing known risks, but not analyzed properly due to lack of perception. Alternately, existing mechanisms or processes may not be enough to address some of these risks. Some risk experts look at it as an issue that is perceived to be potentially significant which may not be fully understood or do not exist but large scale events or circumstances beyond one's direct capacity to control, that impact in ways difficult to imagine today.

The World Economic Forum (World Economic Forum, 2015, pp.12) defines 'global risk' as an uncertain event or condition that if it occurs can cause significant negative impact for several countries or industries within next 10 years. It further observes that a key characteristic of global risks is their potential systemic nature. Its definition of systemic risks aligns global risks with emerging risks, given that systemic risks are characterized by modest tipping points combining indirectly to produce large failures, risk-sharing or contagion as one loss triggers a chain of others,

and hysteresis or systems being unable to recover equilibrium after a shock (Guy Carpenter, pp.10).

A report by the International Risk Governance Council (Emergence of Risks, International Risk Governance Council, pp. 6-7) identified the common ground and major contributing factors which support the development of emerging risks. These are scientific unknowns, loss of safety margins, varying susceptibility to risk, conflict about interests, values and science, social dynamics, technological advances, temporal complications, information asymmetries and malicious motives and act. Applying these factors, an organization can anticipate emerging risks and to better respond and manage these risks at early phase of its development. Economic imbalances, volatile commodity and currency prices, severe budget deficits are some of the indicators of continued systemic vulnerability which could severely impact businesses and individuals, ultimately challenge economic recovery.

Key features of emerging risks

- Their significance is uncertain as they are not well understood.
- They are difficult to quantify as volatility is unknown, historical data is not available.
- Consequences and implications are ambitious, unknown or difficult to predict.
- The connectivity and interactions with other risks can be very complex.
- Some of these may be systemic and outside of organization's control.

Characteristics of Emerging Risks

Risk Management and Insurance Society in their report (Risk Management and Insurance Society, 2010, pp. 3-4) describes characteristic of emerging risks as follows:

Highly Uncertain: It is very difficult to assess the potential frequency and impact of emerging risks. Generally, these are considered to be very low frequency that will not happen in near future, sometimes are present at low impact level, but has potential to grow rapidly at very high impact level.

Example –Worldwide demographic patterns such as age, race, ethnicity, religious preferences are changing. But its economic and political implications and how it would impact any organization or country is unknown.

Lack of Consensus: Most of the time, there is lack of consensus internally within the company as well as externally within public regarding likelihood and impact of these risks. As quoted in survey of emerging risk by Society of Actuaries, “often there is no incentive for firms to contemplate risks that others are ignoring. Even when the management recognizes something is amiss, the market penalizes prudence at least in the short run and in these days of quarterly earnings announcements, management continues to behave somewhat like lemmings.”

Example: Global financial meltdown - Market ignored early signs of recession, there was lack of consensus regarding the inter-relation of various factors and the speed of expected decline.

Relevance is uncertain: There is a high level of uncertainty on how these risks are evolved. It is very difficult to imagine how these risks can be obstacle to or can provide new opportunity to achieve the objectives.

Example: Impact of social media- Recently, there was news of a 14-year-old schoolboy in Texas being handcuffed, arrested and suspended from school for 3 days for bringing home made digital clock. In reaction to this, the social media outrage from people who heard about this made the President of USA to take notice of this boy and invite him to White House. The Mayor of the State and its police department stated that the school authorities were 'following procedures.' However, none of them could foresee the huge impact social media would have on this incident.

Difficult to communicate: It can be very difficult sometimes to make management to understand or explain about an emerging risk. Many times senior management perceives the risk so unlikely to occur that it does not warrant attention (it can't happen here or who told you this is a risk).

Prior to 09/11 incident, while the concept of terrorism was widely known, this risk was not considered seriously. Very few resources were allocated to fight against terrorism. After 09/11, massive funding has been assigned to identify and respond to terrorist threats within the USA and elsewhere.

Difficult to assign ownership: It is not easy to categorize emerging risks with known and accepted risks, and as a result, difficult to assign ownership of the same. Most of the times, interdisciplinary approach is required to understand and manage emerging risks. Example: Global warming, Climate change - No one or group of companies or country can own this risk, but it should be a collective responsibility and coordinated actions are required as increased volatility of climate conditions are significantly affecting all over the world. Also, the timeline for climate change is widely unpredictable.

Systemic or Business Practice Issues: Some emerging risks are embedded in long accepted practices, but may not be fully understood or warrant appropriate attention until triggered by some external or internal change.

Example: Building sub-prime mortgages into securities was long run practice by financial institutions. Due to the complexity of the instrument, accurate assessment of the inherent risks was difficult. The risks became widely understood only after many of the underlying mortgages began to fail followed by global financial meltdown.

Top 5 risks and its movement

Risks interact, leading to higher order effects and unintended consequences. These results are difficult to anticipate and even difficult to avoid. Emerging Risk Survey 2014 (Canadian Institute of Actuaries, Casualty Actuarial Society, and Society of Actuaries, March 2014, pp.16) shows some interesting findings. According to this survey, top five emerging risks named by 62% of respondents are:

- Financial volatility
- Cyber security/interconnectedness of infrastructure
- Liability regimes/regulatory framework
- Blow up in asset prices
- Chinese economic hard landing

Comparing to earlier years reports, there were some notable shifts in the Emerging Risk Survey 2013 results (Canadian Institute of Actuaries, et. al., 2014, pp. 11-12) such as:

- Economic category of risks continues to be the top choice, however its relative importance continues to drop.
- The risk ‘oil price shock’ has fallen consistently in this survey (lower for four consecutive years, down from a high of 45% to 31% in 2012 to 7% year 2013) and fell out of top 5 risks as oil supply improved due to reduced Middle East tensions and new sources coming on-line in North America.
- Respondents’ top choice for single emerging risk was cyber risk.

Participants of Emerging Risk Survey 2013 (Canadian Institute of Actuaries, et al.,2014, pp. 44) have suggested additional emerging risks, some of which are quite alarming:

- Impact of social networking on company reputation
- Social contract risk, pension risk transfer to employees
- Elimination of manufacturing jobs as technology, 3-D printing, etc. replace manual labor
- Global food shortage
- Declining middle class
- Replacement of local retail outlets by on-line shopping and distribution outlets
- Just in time delivery in many industries thwarted by climate/hacking/terror interruption to infrastructure

Global Risk 2015 report by World Economic Forum (World Economic Forum, 2015, pp.9-15) sheds light on global risks with following key features:

- Report is based on annual global risk perception survey by more than 900 members.
- It identifies global risks, their interaction and their two dimensions – likelihood and impact.
- Respondents nominated risks of 2 time horizon -10 years and 18 months.
- Along with global risks, it also it defines trend as a long term pattern that is currently taking place and that could contribute amplifying global risk and/or altering relationship between them.
- The differentiation between trend and risks emphasizes fact that trends unlike risks occurring with certainty and can have both positive and negative consequences.
- Trends are long term, ongoing processes that can alter the future evolution of risks or the interrelation among them without becoming risks themselves.

The evolving Risk Landscape as per World Economic Forum report (World Economic Forum, 2015, pp.17) for the year 2011 to 2015 is as table 1 and 2:

Table 1: Top 5 Global Risks in Terms of Likelihood

2011	2012	2013	2014	2015
Storms and cyclones	Severe income disparity	Severe income disparity	Income disparity	Interstate conflict with regional consequences
Flooding	Chronic fiscal imbalances	Chronic fiscal imbalances	Extreme weather events	Extreme weather events
Corruption	Rising greenhouse gas emissions	Rising greenhouse gas emissions	Unemployment and underemployment	Failure of national governance
Bio-diversity loss	Cyber attacks	Water supply crises	Climate change	State collapse or crisis
Climate change	Water supply crises	Mismanagement of population ageing	Cyber attacks	High structural unemployment or underemployment

Table 2: Top 5 Global Risks in Terms of Impact

2011	2012	2013	2014	2015
Fiscal crises	Major systemic financial failure	Major systemic financial failure	Fiscal crises	Water crises
Climate change	Water supply crises	Water supply crises	Climate change	Rapid and massive spread of infectious diseases
Geopolitical conflict	Food shortage crises	Chronic fiscal imbalances	Water crises	Weapons of mass destruction
Asset price collapse	Chronic fiscal imbalances	Diffusion of weapons of mass destruction	Unemployment and underemployment	Interstate conflict with regional consequences
Extreme energy price volatility	Extreme volatility in energy and agricultural prices	Failure of climate change adaptation	Critical information infrastructure breakdown	Failure of climate change adaptation

Importance of Analyzing and Managing Emerging Risks

ERM process and models provide plans to reduce dramatic volatility in the expected results. However, often unexpected risk or little / not understood interaction of some known risks can cause organizations to fail. Emerging risk management requires an attention to faint signals and early warnings for risks that may or may not substantiate in the future, and with higher or lower impact than anticipated. Therefore, it is imperative for an organization to analyze systematically and logically emerging risks and their impact. Many risks are interrelated, one risk can trigger other. As such, it is important to understand and analyze their correlation and impact in conjunction with 'group of risks'.

For example, risk of oil price volatility was identified back in year in 2009 as an emerging risk which remained in focus for many years, and then gradually moved downwards, whereas risk of economic slowdown in emerging markets was considered as one of the top 5 emerging risks. Oil price plunged dramatically during this year 2015 sending price below \$50 a barrel. Plunge in oil price was triggered by various global factors. This is primarily due to:

- Reduction in demand due to economic hard landing/ slowdown in emerging market, including in Chinese market,
- The USA has been producing shale gas much more effectively and efficiently,
- OPEC has started producing more oil, and
- The impact of historic Iran deal.

For the most part of the world, it is good news, as oil price is a significant contributor to price levels in their consumer basket. Countries such as China who is one of the largest importers of oil and India which imports 75% of its oil requirements, view this as a blessing. A reduction in import bills helps India manage its current account deficit with greater ease. But, it is not good news for oil producing countries. Although all of this should contribute toward the growth of the world economy in the long run, it has a potential adverse and significant impact on oil-producing countries. These countries are now facing the risk of either having their economies de-stabilized or run the risk of defaulting on their debts e.g. Russia and Venezuela. Reduced oil prices can stifle growth plans for oil-producing countries/companies, as they have to pull out from their strategic investment decisions to produce more oil.

The increased interaction of various risks and trends within the macro business environment create additional emerging risks which can severely impact organizations and countries. Failure of understanding and analyzing effects of dramatic downward oil price movement impacted many organizations in the Middle East where economy mainly depends upon oil price. Plunge of oil prices since last year 2014 is expected to produce fiscal deficits in all six GCC countries. According to Ministry of Development and statistics (Qatar Economic Outlook 2014-15, pp.14-19), average crude oil forecast for 2014 and 2015 was \$104.2 and \$97.9 per barrel and corresponding break-even oil price was \$52.9 and \$67.7 per barrel respectively.

Volkswagen case is the classic example of failure ERM. Although at this stage it's unclear who know what and when, it must have had chain of management command that approved fitting of cheating devices to its engines. Whatever may be the case it's obvious that their ERM team failed to identify the risk associated with such approval, its velocity by which it can potentially

impact company earnings and its financial and reputation impact, in timely and accurate manner. This demonstrates the need to properly analyze emerging risks and its impact on company's earning. Today, there is a need to work jointly by finance and risk professionals, than ever.

The real challenge for risk professionals is to uncover these risks, analyze their impact, plan resources to address them, and build models that will ensure the survival (or upward mobility) of an organization in case these risks materialize. They should be vigilant, scanning internal and external environment for emerging trends. Companies those manages emerging risks successfully will outlast their competition in the long run.

In view of above, some of the key issues related to emerging risks which warrant attention are discussed below with possible approach for its management:

- ERM and Emerging Risks Management
- Identifying and Quantifying Emerging risks
- Risk Velocity and Time Horizon
- Risk Appetite, Stress Testing and Capital Model
- Effect of Macro and Micro Economic factors
- Risk as an Opportunity
- Role of Risk Manager

ERM has been well adopted mainly in finance and insurance industry; but in other industry, either it does not exist or is at premature stage. Also, we see an awareness of ERM mainly within advanced countries such as North America, Europe, UK, Australia and within some Asian countries. As such, ERM has yet to be universally accepted as an essential business discipline by all industries. Issues are discussed below considering existing ERM practices and processes, which have its own limitations, and hope for further contribution or future research from risk management and finance experts, so that robust emerging risk management would form part of ERM framework. Especially, quantification of emerging risk methodology and building up an appropriate capital model are the real challenges to actuaries and financial academics.

ERM and Emerging Risks Management

ERM has become a standard practice in most of the advanced organizations. ERM helps organizations to focus on the relevant risks, help achieving an organization's goals, both from an operational as well as a strategic perspective. A successful ERM implementation involves a step change in the attitude to risk in the company, a good risk culture, embedding ERM within decision making and an acceptance that risk is everyone's responsibility. Companies operates for profits and do not intend to fail. This provides the motivation for addressing emerging risks.

Many organizations tend to focus mainly on near-term risks without paying adequate attention to emerging risks. Emerging risks are overlooked as organization tends to focus on internal and better-known issues or think of external risk primarily in the context of macro-level global issues which are well known and much discussed. Emerging risks also might be ignored if blindly follow the existing ERM framework and practices which do not identify the interconnectivity of various risks impacting organization's earning. Existing ERM frameworks can be modified/ amended logically depending upon the risk profile and as per the need of the given organization, adding parameter for emerging risks under each possible component.

Identifying and Quantifying Emerging Risks

The best practices to identify and quantify emerging risks are still evolving, and will continue to evolve. Still existing tools and processes can be used for evaluating such risks. e.g. management theory such as scenario planning, strategic foresight, environmental scanning etc., can be possible approaches for understanding, identifying and managing emerging risks.

For emerging risks, the qualitative scanning, assessment and monitoring are important to be followed by quantification. Clear communication and appropriate governance is key to qualitative assessment, whereas knowing when and how to balance speed and precision is key to quantification. To extrapolate future losses from historical data does not work. Thus foresight is needed, horizon scanning to detect emerging risks, and scenario exercises to explore their impact would be useful. Whatever theory we adopt, a formal, documented process should be established which should involve members from senior management so that they can address these risks in strategic plans. Also, the frequency of such reviews shall ensure that any new information about emerging risks is analyzed and assessed as soon as it is discovered.

Risk Velocity and Time Horizon

This is the key factor one has to consider in respect of emerging risk. Risk velocity is the time to impact that is, it is an estimate of time frame within which a risk may occur. It highly matters because when velocity is low, we have more time to respond to the risks. We may take steps to reduce the probability and/or impact. We can have time to develop a contingency plan and a fallback plan i.e. a plan to be executed if the contingency plan fails. However, if the velocity is very high, we may have little to no time to modify / act upon the risk. If the risk had not been previously identified, it would be wise to develop a 'workaround plan' i.e., a response to a threat that has occurred, for which a prior response had not been planned, to reduce some impact and surprise.

To rate risk velocity, conducting qualitative risk analysis which includes to rate probability and impact is useful. For example, on a scale of 1 to 5, we might rate probability of a risk as 4 and impact as 5. We multiply these ratings to get the risk score of 20. On the basis of risk score, severity can be classified. In addition, it would be useful identifying top 10 emerging risks for a company and estimating risk velocity of these risks in terms of very rapid, rapid and slow, depending upon impact and speed by which it can possibly hit in predefined time frame. E.g. very rapid means impact of the risk is evident in a year, rapid means impact of the risk is evident in near future and slow means impact of the risk is evident within few years. Regular horizon screening would be useful to avoid surprises.

Risk Appetite, Stress Testing and Capital Model

Risk Appetite is a clear statement about the amount of and quality of risks a company is willing to undertake, about the ability of the company to bear risks and the limits to those possibilities. Key drivers behind this are a general trend towards incorporating ERM in strategic decision-making, regulatory developments and requirements from rating agencies. This is also in line with Solvency II Pillar 2 requirement. It acts as a link between the corporate strategy of the company as a whole and the daily risk assumption, consistent with guidelines from board members. Profitability targets and a risk appetite statement cannot be viewed in isolation. Having said that, while considering its array of risks exposure, it is imperative to consider emerging risks within given time horizon. Otherwise, impact of emerging risks can potentially limit achievable return on capital or in worst case can results in losses.

Stress Testing is an integral part to the way companies are managed including setting risk appetite, defining business and strategic plans, and setting the capital plan. Stress testing is an important component of risk governance and plays a key role in the measurement of risk appetite. The stress testing operating model has to be tailored to suit the structure and strategy of the firm and reflects the business involvement, with logical assumptions with due consideration for emerging risks impact. Considering company's top 10 emerging risks stresses within model would be useful.

Capital Model -There has been no much attention on multiple years modeling that can capture potential for correlation across the years. Solvency II also focus mainly on one year approach. This might be because of the complexity of the issue but should not be intimidating. This process should include scenario testing. Historical data to be combined with some extreme scenario from emerging risks. Ultimately, capital model should help in decision making that works well not only for a single year but also across the cycle and across all correlated lines of business.

Effect of Macro and Micro Economic Factors

Companies are increasingly concerned and focused on understanding the drivers that create volatility in companies' earnings and profitability. Companies may make strategic miscalculation if they do not understand net impact of the risks embedded in inputs, outputs operations and importantly the markets in which they operate. Faster communication systems, closer trade and investment links, increasing physical mobility and enhanced access to information have combined to bind countries, economies and businesses more tightly together. For this, it is important for a company to consider impact of macroeconomic upheaval, regulatory uncertainty and pace and scale of events introducing uncertainty into corporate earnings. At the same time, it is important to understand and analyze impact of microeconomic factors in which the company operates such as competitor actions, demand and supply, market size, social behavior, political environment and strategic plans. Microeconomic factors especially matter for the companies, where relatively small variations in microeconomic factors produce significant impact and volatility in their earning.

For example, oil prices have tumbled below \$50 a barrel, almost 35% since their peak in June 2015. As a result, Project 'Al Karana' in Qatar, a joint venture which would have produced 2 million tons a year of petrochemicals, the largest of its kind in the world, was shelved (Saadi D, 2014). Due to this, many related projects interconnected with other industries forced to cancel their

contracts, resulted in heavy layoffs in major oil companies with similar impact on major international and other national contracting companies. It also affected other industries such as banking, finance and housing sector.

It is important to consider macro-level trends with due attention to important micro-level issues (organizational or industry related) that may be developing. It's often challenging to establish credible links between the 'global issues' which triggers 'local issues' and the practical impact of these issues on the risk profile of any particular organization. Without such credibility, the emerging risks may have little actionable value..

Risk as an Opportunity

Risk can be viewed in a number of ways. Many generally tend to focus on volatility, downside risk, or for financial institutions, it is the solvency events. The downside focus of risk measures highlights what could be key problems due to emerging risks around. All technological inventions, developments e.g. high speed mode of transport such as cars, airplanes, medicine, internet etc., were once emerging risks, and they have caused losses or destruction through accidents, antibiotic resistance, climate change, and now, a threat of cyber risk. But they have offered far better speedy travel, longer and much healthier lives, wealth of knowledge, and connectivity through internet.

Every organization today faces some degree of uncertainty that appears to be evolving at quickening pace. With dynamic ERM approach, risk managers should view risk as two sided, with opportunities drawn out of the same tools and datasets used for risk mitigation. Some are evolving toward incorporating strategic risks in their analysis and look at upside opportunities. This approach is not new. The instances where volatility and mean reversion led to opportunistic trading is the example of tapering risk as an opportunity adopted by many experts in financial market till date. Continually improving our understanding of risk is imperative for the future finance as a whole. Improved understanding should lead to view of emerging risk as an opportunity than as a threat. Greater knowledge rather means these are no more emerging risks.

Emerging Opportunities

The survey conducted by Society of Actuaries (Emerging Risk Survey, 2014, pp.42-43) when asked about emerging opportunities, responses were as follows:

- Arbitrage created by evolving experience (ex. mortality) compared to static assumption scenario for pricing of insurance coverage.
- Demographic shift.
- Climate change, demographic changes, regional instability
- Investment opportunities due to climate change such as warmer climates in Canada more receptive to farming and wetter climates near the Sahara allowing recapture of cropland.
- Increased use of solar, it is both an opportunity and risk.

Current immigration crisis in Europe can be one of the examples of risk as an opportunity. Hungary could not cope with this crisis and there is hue and cry about the way it is handling immigrants among the EU members. It seems that Croatia did not analyze it properly and they have to close their borders in less than 24 hours after welcoming immigrants. On the other hand, some countries like Germany, Sweden, Austria, seem to be well prepared to face this crisis and even benefit from

this. They have well prepared plans and resources in place to welcome the large number of immigrants and utilize them as a workforce in nation building.

Role of Risk Manager

A good risk manager should not try to predict the future but assume that anything can happen and that we can't know what is going to happen (or not happen). ERM is not a profit or cost center but should be considered as value addition. It requires a balancing act between those who don't want to accept any risk and those who look only at returns. It is important to qualitatively look at risk exposures and what-ifs, and develop quantitative metrics to measure returns relative to some type of capital measure. Involving people with different perspectives and good communication is useful in achieving the desired results. Risk manager's role is crucial to achieve these goals. Adopting a perfect combination of top-down and bottom-top ERM approach would be useful which ultimately would connect the management with the organization from all the corners.

Emerging risks by its nature are new risks or unknown risks. Conventional thought process cannot be applied for testing the impact of emerging risks against business model. As these risks are results of continuous and sometimes accelerated factors such as wars, technological innovations, social media, etc. these may manifest itself in a manner other than conventional expectation. The analysis of these risks should also consider other than most logical development paths that are possible even if they seem extremely remote. So, he has to think 'out of the box'. He should be vigilant, innovative, apply new methodologies to predict risks. Use of simulations and 'what if' analysis can help management understand the effects of potential emerging risks.

The challenge for risk manager lies in uncovering these emerging risks, bringing resources to bear to address these risks, and building resiliency and sustainability for events that cannot be predicted through the usual historical analysis and risk models. Given that competitive advantage lies in addressing issues in a nimble and efficient manner, risk managers can add value to organizations by helping communicate risk issues and allocate resources appropriately, and by turning emerging risks into opportunities. By having a constant and robust discipline of scanning the internal and external environment for emerging trends, he can lead company to formulate more effective strategies and build plans to execute those strategies while managing the underlying risks effectively.

Conclusion and Suggestion

Emerging risks introduce volatility into companies' earnings. In this interconnected global environment, most companies remain vulnerable to risks that may initially appear unrelated until an unanticipated event occurs, but can be triggered by any unexpected event, such as the natural disaster Hurricane Katrina, or familiar risks in unfamiliar conditions, such as Fukushima Daiichi nuclear disaster in Japan. Such extreme events compel greater attention due to their potential for generating expansive and catastrophic harm. Across industries and geographies, emerging risks are jeopardizing companies' stakeholders, internal and external.

Companies need to be prepared for a reality in which emerging risks increasingly affect their earnings, profits and long-term strategy. These risks fall outside the customary cognitive and decision making frameworks. Therefore, organizations need to improve their ability and

capabilities to detect, assess, and respond to these risks, which can quickly develop into full-blown crises. Those that develop the ability to manage emerging risks will gain a significant competitive advantage over rivals who lack this level of sophistication.

ERM and risk professional has a crucial role to play guiding organization in identifying, analyzing and responding array of risks including emerging risks. While considering emerging risks and their impact, one should adopt balanced approach related to macro and micro level industry wide issues and screening horizon for risk velocity. Risk velocity is major component while considering its impact. Risk appetite has to be considered for longer time horizon. Existing ERM framework, budgeting/ planning methods and capital model are not fully supporting to capture the issues related to emerging risks appropriately. Risk and finance professionals and academicians should work jointly to come up with much comprehensive approach for given industry.

Any procedure, process, tool or method we develop and adopt should ultimately help an organization to recognize risk and opportunity in taking a 'wise' business decision to build economic value. While doing so, one must keep in a mind that ERM is not a science, neither a math nor an art; it's a logical combination of all.

References

- Canadian Institute of Actuaries & Casualty Actuarial Society, et.al. (2014, March). *Emerging Risks Survey*. Retrieved August 8, 2015, from <https://www.soa.org/Files/Research/Projects/research-2014-emerging-risk-survey.pdf>
- Carpenter, G. (2014, September 31). *Ahead of the Curve: Understanding Emerging Risks*. Retrieved August 1, 2015, from <http://www.mmc.com/content/dam/mmc-web/Files/AheadoftheCurve-UnderstandingEmergingRisks.pdf>
- Dionnet, D., & Mainguy, B. (Eds.). (2009 , October). *Enterprise Risk Management*. Retrieved August 3, 2015, from http://www.scor.com/PandC_docs/SCOR_FocusERM_102009.pdf
- McKinsey & Company. (2011, May). *Risk modeling in a new paradigm: developing new insight and foresight on structural risk*. Retrieved August 10, 2015, from http://www.mckinsey.com/~media/McKinsey/dotcom/client_service/Risk/Working%20papers/13_Risk%20modeling%20in%20a%20new%20paradigm.ashx
- Ministry of Development Planning and Statistics, Qatar. (2014 , June). *Qatar Economic Outlook 2014-2015*. Retrieved August 9, 2015, from http://www.gsdp.gov.qa/portal/page/portal/gsdp_en/knowledge_center/Publications/Tab3/QEO2014-2015EnUpdate.pdf
- RIMS – Risk and Insurance Management Society. (2010, May 4). *Emerging Risks and Enterprise Risk Management*. Retrieved August 4, 2015, from https://www.rims.org/resources/ERM/Documents/EmergingRisk_ERMweb.pdf
- Saadi, D. (2014, December 8). Qatar Petroleum and Shell pull out of \$6.4bn Al Karaana project as oil price slides. The National. Retrieved August 7, 2015, from <http://www.thenational.ae/business/energy/qatar-petroleum-and-shell-pull-out-of-64bn-al-karaana-project-as-oil-price-slides>
- Schmitz, J., Wittenberg, A., & Robson, M. (2011, December). *Dynamic Financial Planning*. Retrieved August 2, 2015, from http://www.oliverwyman.com/content/dam/oliverwyman/global/en/files/archive/2011/Dynamic_Financial_Planning_Final_Version.pdf
- The Emergence of Risks - Contributing Factors: Report. (2010). International Risk Governance Council : Geneva. Retrieved August 9,2015, from http://irgc.org/IMG/pdf/irgc_ER_final_07jan_web.pdf
- World Economic Forum. (2015). *Global Risks 2015*. World Economic Forum. Retrieved August 6, 2015, from http://www3.weforum.org/docs/WEF_Global_Risks_2015_Report15.pdf

THE FUNDING OF SUBSIDIARIES EQUITY, “DOUBLE LEVERAGE,” AND THE RISK OF BANK HOLDING COMPANIES (BHCS)

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Abstract: *Double leverage” is the circumstance in which the parent company issues debt and acquires shares in the equity of subsidiaries (Board of Governors of the Federal Reserve System, 2012). The concern of financial authorities is that such practice reduces the group capital, and bring risk to the firm. The paper is an extensive discussion on this regulatory issue, and provides quantitative evidence on the impact from double leverage on the risk undertaken by Bank Holding Companies (BHCs). For a large sample of United States BHCs we observe that firms exhibit a huge appetite for risk while they raise in the so-called “double leverage ratio.” Several tests do suggest the existence of causality. Our view is that, by double leveraging BHCs can exploit a shortfall in the consolidated capital, and are tempted to risk more. Based on our findings we give suggestions for a more effective monitoring of banking groups.*

Keywords: *Bank Holding Companies; Equity Financing; Double Leverage; Risk“*

HOW TO MANAGE RISK MORE RELIABLY BY REAL OPTION MODEL? MULTIPLEX AND DISTRIBUTION BASED APPROACHES

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Abstract: *Real option model as an advanced project economic valuation model is able to capture market and private risks, and management flexibility. In spite of real option model influence, it is not sufficiently in use by decision makers, due to various criticisms on real option method.*

This study is an attempt to address some of the major criticisms of real option model. At first focusing on combination of private risk and real option model, distribution based approach is suggested. In this model the final real option value is divisible to market and private risks, considering the different effect of these two source of risks. Since the fact that prices of real world assets (commodities) follow from mean reversion process commonly accepted by academics, due to their long life and supply-demand effect on assets, in next step a version of real option model which is able to capture all concurrent flexibilities of manager with mean reversion process is presented. Besides it is in importance to know how the result of model should be interpreted in real world problems, then the interpretation of real option model is discussed as well. Finally, applying the presented more reliable real option pricing model in real case and discussing its interpretation we try to make the suggested model more intuitive and clear.

Keywords: *Real option, Private risk, Option to choose, Defer option, Leakage rate*

Introduction

Capital investment decision-making is an important challenge for managers. Economic valuation of projects and making strategic decision about their initiation or continuation is a complex task, which take into consideration significant sums of money to invest, long lifetime of a project, and project return and market uncertainties. Therefore, it is crucial for an organization to accurately measure the benefits and risks of project during the planning phase.

Real option methodology, introduced in 1990s, is an advanced method to evaluate the economic value of a project, inspiring from financial option tool. For the last two decades, real option approach has been a legitimate and widely used method in both academic and managerial communities and has gained a surge of attentions by scholars considering its advantages to capture the below features

- 1) Market uncertainty about future prices
- 2) Manager's flexibility to choose different strategies in future
- 3) private uncertainty specific to project (Borison, 2005)

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Although the previous methods which are used in practice, has certain merits; yet they all have considerable limitations due to the assumptions that they make regarding the aforementioned features. Table 1 summarizes the most common project evaluation methods, their assumptions and limitations.

Table 1: Project evaluation methods characteristics

Method	Brief description	Assumptions	Limitations
NPV& IRR	Discount back cash flows to present time. The project present value is the decision criterion	Future path of project is predictable (No management flexibility) Future prices are predictable (no market risk)	Not able to capture the tree important feature
Monte Carlo simulations	Simulate future prices based on given distribution. The average of prices apply to the NPV model	Future path of project is predictable (No management flexibility) 2. No private risk	The model is computationally intense with no private risk
DTA	Future prices are deterministic. The project path will be flexible based on technical uncertainties	Future path of project is predictable (No management flexibility) Future prices are predictable (no market risk)	Difficulties in determination of suitable interest rate and with no market risk
Scenario based analysis	Consider different possible scenarios which may apply depending on project situation and further information.	Future path of project is predictable (No management flexibility)	Limited scenarios to the private uncertainty and with no market risk

The intuition behind the methodology is that future commodity prices (and hence the intrinsic project value) are uncertain, but can be predicted by an appropriate stochastic process. In addition, in a project, decision makers have opportunity, but not the obligation, to change the project's path, which is a feature similar to financial options. The different kinds of manager's flexibility –i.e., real options– summarized in table 2.

Table 2: Type of Real Option

No		Equivalent option	Definition
1	Expand	Call option	Decision to expand the scale of project
2	Abandon		Decision to abandon project usually for a salvage value
3			Decision to shift the activity of the project
4	Contract	Put option e.g. outsourcing	Decision to decrease the scope of project,
5	Defer (wait)	Call option with leakage (Deferred premium option)	Decision about start time of project
6	Choose		Concurrent options with some or
7	Stage (compound)	Compound option	Phasing project, and deciding about each phase (parallel or sequential)

In addition to aforementioned benefits of real option model, it is more than just a single economic value for the project. Real option result has also conceptual benefits and helps managers to capture strategic considerations. In other words real option consider objectives as well as solutions.

Real option methodology has an established academic tradition. However, some surveys show that, although managers believe in uncertainty effects in project value, most of them prefer not to use real option. A survey by Bain & Company shows that one-third of 451 senior executives who had applied real option, had given up using it the same year, because of its technical difficulty and its limitation in dealing with complex options (not able to capture all kind of optionality the same time) of the real world setting (T.Copelan, p.Tufano, 2004). Copeland and Antikarov (2005), in their research conclude that decision makers could not trust real option results, because they are not fitted for real world characteristics. Ryan and Ryan (2002) report that only 11.4 percent of fortune 1000 CFOs use real option. Block (2007) shows that during these 5 years, the use of real option has increased only 2.9 percent. In addition, Baker et al (2011), observed that only 16.8 percent of Canadian firms use real option.

In all, real option models are able to capture important factors of manager's decision making flexibility and market and private uncertainties, while they have still some limitations. As mentioned above, there are lots of criticisms on real option models, because these models are not suitable for real world applications (T.Copelan, P.Tufano, 2004), also, there are not sufficient understanding of real option's result interpretation.

Motivated by aforementioned criticisms of current real option models, and to add to this line of research, this article has treepurposes. The first purpose is to suggest an improved model which is able to capture private and market risks, second one is to find a model which consider all kind of concurrent options _i.e, management flexibility_ in the model. Finally, with the aim of bringing more intuition to decision making based on real option model, the interpretation of real option result is discussed . The remainder of this article is organized as follows. In next section, a brief description of our assumptions and current real option model's shortage discussed. The suggested approaches and methods discussed in section 3. Section 4 presents a real case application of the proposed model and provides sensitivity analysis of the result. Finally, Section 5 draws the conclusions of the research.

Literature review

In real option study, the same as financialoptions, there are various pricing methods.Compared with other evaluation methods, binomial method has higher flexibility in modeling multiple uncertainties, multiple concurrent options and complex payoff characteristics. Therefore, considering that options involved in real projects are more complicated than financial options, binomial tree is a more suitable option evaluation method for real option applications. In addition to its computational advantages, binomial tree model provides an efficient discrete approximation of stochastic process, which is a transparent answer for manager to analyze (W.J.Hahn; J.S.Dyer, 2008). Therefore the focus of this article is on binomial tree ofNelson-Ramaswamy model (D.B Nelson, K.Ramaswamy, 1990)

One important feature of real option evaluation is market risk, which is captured by assumption of stochastic price prediction for future. In this article mean reversion process is the pre-assumption to capture market uncertainty, considering that in literature it is commonly accepted that this process gives better estimation of commodity prices, due to their long life and supply-demand effect on assets (E.S.Schwartz, 1997).

Another feature of real option valuation is private risk. Private risk is any source of risk other than market risk, which stem from being unclear about new resources, technological uncertainty and so on . The option pricing model itself do not capture private risk, and there are various study which try to combine the private risk feature with option pricing models, yet the topic of addressing both market risk and private risk still is a debatable topic with no quite acceptable and unique answer in real option study. The first try to a real option model which capture both private and market risk is applying an adjusted discount rate as a premium value for the private risk in the model, while this discount rate is completely subjective value.

The combination of the decision tree and real option model is the most noteworthy approach to the problem, which first time suggested by (T.Copeland, P. Tufano, 2004). The model assume stochastic process for prices to capture market risk, and private risk as success probabilities that enter to decision nodes of the decision tree. The idea developed further by several studies, still these methods suffering from exponential increase in the calculation volume and are limited to the simple option models. Also, the final result of these models are inseparable into market and private risks, which is important characteristic of a model.

It is greatly important that a model be able to differentiate between market and private risks in valuation process, due to different effect of them. Market risk _ market uncertainty of future prices _ is possible to be hedged, then considering the management flexibility, it brings value to option. On the other hand, private risk _ technological, organizational or other kind of risk specific to the project _ is not possible to be hedged, then it will decrease the option value. Treating the two different source of risks the same will cause underestimation or overestimation of the real option value.

On the other hand, estimation of the private risk value is not an easy task. In most cases, it is more facile to find the probability distribution of the size of private risk which is more accurate value than a single number. Considering the fact that the private risk distribution is more often available information, and need of a real option model which separately deal with private and market risk, we introduce distribution based real option approach.

The other part of this study focus on management flexibility topic. Decision making about the initiating time of a project is a momentous subject for managers which is evaluated in real option models by defer option. The idea behind defer option is that later entrance in the market will probably cause getting more information and losing market share. Then the value of option in defer option model decrease by a leakage rate percentage for each period of deferring to enter the market. The defer option evaluation is exactly the same as option pricing with dividend, but it is not attempted in mean reversion models yet. In addition, in real world, the expense of delay in entering the market increases by time (dynamic leakage rate), which is not addressed in literature.

Besides defer option, the project manager has authority to decide about the project status during the lifetime of the project, since the project start. These different statuses are defined as various options and the collection of these concurrent options could be captured by option to choose. A reliable real option model should be able to capture all the aforementioned optionality of a project. Such a model introduced by (C. Okan Özogul, E. Ertugrul Karsak., 2009) which evaluate defer option and option to choose by a multiplex binomial tree with Geometric Brownian motion. We will develop the model to the multiplex binomial tree with mean reversion process in this study.

Finally, we will address the real option interpretation value. Real option methodology is not only an advanced economic evaluation model with single value, but the real option result is capable to be applied as a strategic decision making tool. However, in real option literature, there are several studies that criticize the difficulty of understanding and interpretation of the real option result as

the main reason for its lack of application. In spite the necessity of studying real option result, it is not concentrated in literature properly. In context of real option result interpretation, study of Pascal triangular briefly mentioned by (P.Kodukula, C.Papudesu, 2006). In next sections, the Pascal triangle interpretation method will be exemplified and discussed for better insight.

Developed real option model methodology

As previously mentioned in detail, there are different criticisms on real option model which stem from the fact that real option model is not fit to real world characteristics.

In this section we will discuss and suggest models to address these criticisms to find a more reliable real option model. In order to do this, the purpose of this paper is to find 1. A new real option approach with private risk consideration, 2. Multiplex real option model with mean reversion process and, 3. Better insight of real option value interpretation.

Private risk distribution based real option model

Although capturing market risk by real option model is of great importance, but a reliable model should be able to consider private risk as well. Besides, the model should be detachable from private risk and market risk, due to different effect of these two source of risks.

Private risk or operational risk is any kind of risk other than market risk which include technology risk, economic risk, ecological risk and so on. Private risk could happen at any point of time (node in binomial tree) during project's lifetime. In distribution based model, we focus on the fact that no matter what is the source of private risk, it always directly affects the net present value (NPV) of the project. In real option models, NPV of the project is applied as the initial value of the asset in option pricing model. Then focusing on the NPV changes ensued from private risk, help to model real option which consider both market and private risks.

In private risk distribution based model, each point of uncertainty instead of just one single value contains a distribution of probable values of uncertainty which is approximated by several district points of value. Each point of these district values is considered as a separate value with related probability to calculate the NPV of the project. Distribution of the NPV values (a discrit approximation of distribution) results from following the same process for all the district values of the private risk. Calculating real option value for each point of the NPV district distribution gives the distribution of real option values. The result of this model is numerous real option values as an approximation of district distribution of real option value, which gives more precise result by not to lose the available information. This model also helps to analyze the result more accurate due to separable answer to private and market risk. Besides, the expectation of real option value distribution could be considered as a single value for real option. Figure 1 shows explicitly the option valuation process in wich star points in binomial tree are sample private uncertainty points (1a), as each star point contain information of a distribution of private uncertainty (1b).

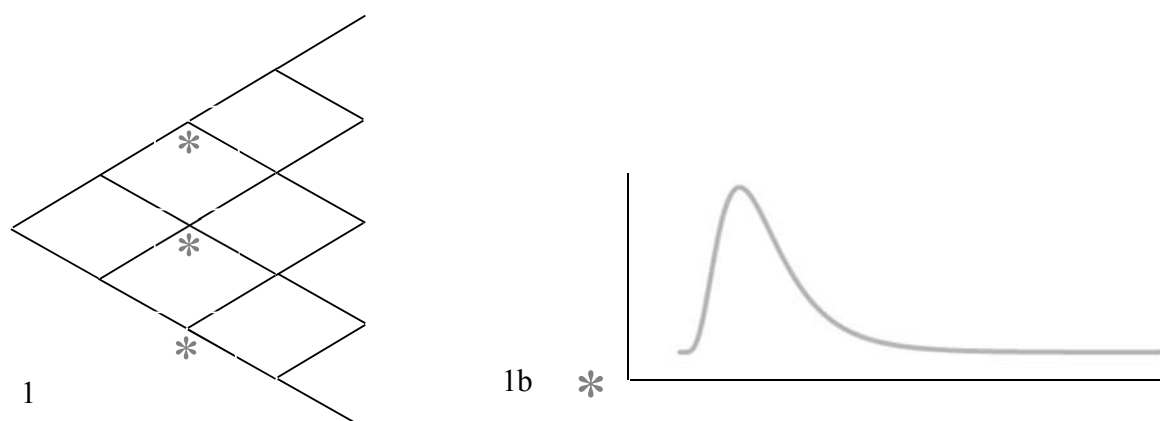


Figure 1a : binomial tree, the star nodes are sample nodes with private uncertainty. Figure 1b: sample private uncertainty distribution

To give more intuition of the model, suppose that there is uncertainty about the volume of reservoir in a mining project. In this example the revenue of the project is related directly to the quality of extracted material. Based on different value of the private uncertainty the NPV and then real option distribution will be calculated. In another case, assume that in the second year of the project life (star points) there is an uncertainty about availability of the raw material which will affect its price, and then subsequently the project revenue. This risk cause an uncertain value for the NPV of the project. To evaluate the project with private distribution based model, several NPV values based on the distribution of private risk should be calculated, and applied to compute the distribution of the real option value.

The advantages of private risk distribution based model are as follow:

- 1: Private and market risk effects are completely separated from each other and then it is possible to study the distinct impact of them on real option value.
- 2: Help to not lose available information. In real cases, private uncertainties commonly are reported in the form of distribution and not just a single value, in project's technical and economic studies. Although this approach keeps more information for the final value and gives more accurate result, but it increases the volume of calculation and is limited in the number of private uncertainty sources. All in all, in spite of the advantages of private risk distribution model, its applicability depend on the source of private risk and project characteristics.

Mean reversion defer option with dynamic leakage rate evaluation

In this section we illustrate GBM defer option with dynamic leakage rate evaluation method by an example, then try to extend the differ option pricing to the mean reversion model. To develop the multiplex mean reversion option pricing model, at first we need to model mean reversion differ option pricing. The result of this section will be applied to the multiplex mean reversion model construction.

Defer option with dynamic leakage rate

Defer option for the evaluation purpose is a vanilla call option with leakage rate and the restriction that option should be exercised during option life. In previous studies leakage rate has been considered as a constant value or even zero, while in real world, the cost of later entrance in the market increase in time. The following example shows binomial tree defer option pricing with dynamic leakage rate.

Example: There is a proposal for a project with 80\$ gross value in which decision maker have authority to defer project initiating time for three years. The required investment of the project is 70\$ (I_0), risk free rate is equal to 5% and leakage rate for the first year of later entrance is 1%, second year is 2% and third year is 3%.

In defer option pricing model the exercise price (initial investment) increase per year by risk free rate. The first number in each node of the tree in figure is the asset price, the second number is the value of exercising option at that point and the third value is the value of continuing project without change for later exercise of option. The decision in this tree is to wait until the third year for initiating the project, and the value of defer option is 31.95 \$. Figure 2 presents binomial tree of defer option, also the required investment shows by I_i and the probability of up moves by P_i , in each period.

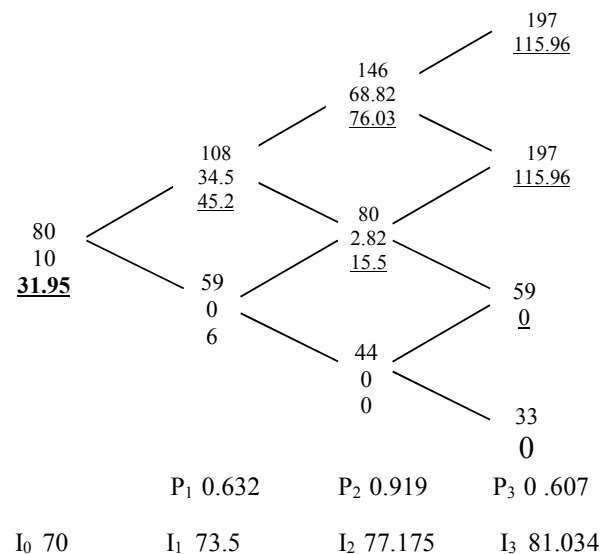


Figure 2: defer option binomial tree

Mean reversion defer option in binomial tree model

Defer option pricing is similar to financial call option with dividend. The leakage rate in defer option decrease the value of the option per period the same as dividend payment. As in section 2 mentioned, in this study we will try to develop the Nelson-Ramaswamy mean reversion binomial tree model to the model with dividend, and apply it to price defer option. To conclude mean reversion option pricing with dividend model, we will focus on different option pricing model in this section.

GBM binomial tree with dividend ,Cox-Ross-Rubenstein model

The GBM differential equation with dividend is equal to

$$dS_t = (r - d) S_t dt + \sigma S_t dw_t$$

Where the σ stands for volatility, r for drift of the process (risk free rate), d for dividend, S_t asset price at time t , and dw_t for wiener process at time t . In binomial tree models, asset price moves up or down to a determined values with special risk-neutral probability. The up and down move values and up move probability are shown in following respectively by up, down and P .

$$up = \exp(\sigma\sqrt{\Delta t})$$

$$down = \exp(-\sigma\sqrt{\Delta t})$$

$$P = \frac{\exp(r - d)\sqrt{\Delta t} - down}{up - down}$$

Brownian motion binomial tree with dividend, Nelson-Ramaswamy model

The Nelson_Ramaswamy (1990) propose a general method for binomial option pricing model which fix the up and down moves in each step of the tree (for constant variance) and calculate the conditional probability of up moves _conditioned on the position of node to reflect the drift_. The generality of model is due to possibility of applying different kind of stochastic process in model. This model calculated based on Brownian motion (BM) stochastic process, in BM the differential equation is equal to

$$dS_t = r dt + \sigma dw_t$$

$$up = S_t + \sigma\sqrt{\Delta t}$$

$$down = S_t - \sigma\sqrt{\Delta t}$$

$$P = \begin{cases} \frac{1}{2} + \frac{r\sqrt{\Delta t}}{2\sigma} & \text{if } 0 \leq P \leq 1 \\ 0 & \text{if } P \leq 0 \\ 1 & \text{if } P \geq 1 \end{cases}$$

The up probability in this model has been calculated with the similar equation as Cox-Ross-Rubenstein model by the following equation

$$P = \frac{S_t(1 + r) - down}{up - down}$$

Inserting the dividend rate (d) in this equation, we can conclude the following up probability for the dividend version of Nelson-Ramaswamy model.

$$P = \begin{cases} \frac{1}{2} + \frac{(r-d) \sqrt{\Delta t}}{2 \sigma} & \text{if } 0 \leq P \leq 1 \\ 0 & \text{if } P \leq 0 \\ 1 & \text{if } P \geq 1 \end{cases}$$

Mean reversion binomial tree with dividend

Mean reversion binomial tree option pricing model suggested by Nelson_Ramaswamy. This model is based on the Ornstein-Uhlenbeck stochastic process with following differential equation

$$dS_t = \lambda (S_t - \bar{S}) dt + \sigma dw_t$$

Where λ is the mean reversion coefficient, and \bar{S} is the long term value of S. In this model the up and down movement, and up probability are as follow

$$up = S_t + \sigma \sqrt{\Delta t}$$

$$down = S_t - \sigma \sqrt{\Delta t}$$

$$P = \begin{cases} \frac{1}{2} + \frac{\lambda (S_t - \bar{S}) \sqrt{\Delta t}}{2 \sigma} & \text{if } 0 \leq P \leq 1 \\ 0 & \text{if } P \leq 0 \\ 1 & \text{if } P \geq 1 \end{cases}$$

In financial mathematic contexts the differential equation of mean reversion process _i.e, Ornstein-Uhlenbeck _ with dividend is as follow

$$dS_t = \lambda [(S_t - \bar{S}) - d] dt + \sigma dw_t$$

Substituting the mean reversion drift for mean reversion with dividend drift in the Nelson-Ramaswamy model, the up probability movement would be as follow

$$P = \begin{cases} \frac{1}{2} + \frac{\lambda [(S_t - \bar{S}) - d] \sqrt{\Delta t}}{2 \sigma} & \text{if } 0 \leq P \leq 1 \\ 0 & \text{if } P \leq 0 \\ 1 & \text{if } P \geq 1 \end{cases}$$

Multiplex binomial tree with mean reversion process

As previously mentioned multiplex binomial tree which evaluate the concurrent option to choose and defer option is more realistic model. On the other hand the idea that assets in real world (commodities) follow from mean reversion process commonly accepted in literature. In this regards, the mean reversion multiplex binomial tree will introduce to improve the real option model to a more reliable model. To reach this aim, we already introduced the mean reversion defer option pricing model and, in next step, we will use the model to build the multiplex mean reversion tree.

Multiplex binomial tree is combination of two type of binomial tree, main binomial tree and several binomial sub-trees related to each node of the main tree as presented in figure 3. In this model, the main tree (blue tree) evaluate the defer option and sub-trees (red trees) are responsible for calculation of choose option. The multiplex option pricing process is as follow:

In the main tree, the gross value of the project considered as the initial asset. The value of the exercised defer option (asset value minus the initial investment) in each node apply as initial value in the sub-trees, $S_{i,j}$ for position i and j in figure. The sub-trees value calculation are the same as usual binomial tree to choose. In next step, the option value plus the initial value of the sub-trees, which present in the figure by $F_{i,j}$, are switched with the $S_{i,j}$ values in the main tree. Finally the main tree become a binomial tree with $F_{i,j}$ values. Then the remaining process is backward binomial tree calculation, which is exactly similar to simple binomial tree calculation with value of $F_{i,j}$ in each node.

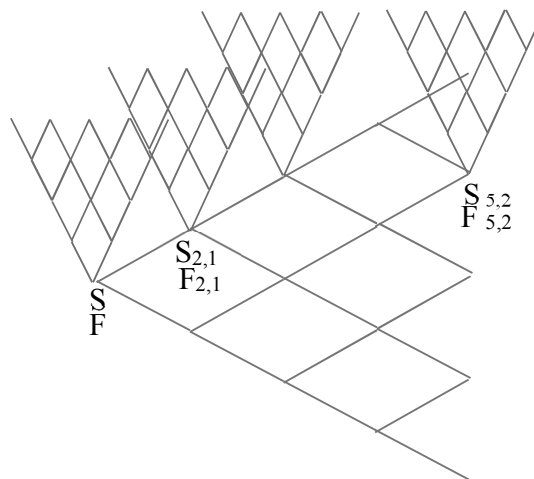


Figure 3: mean reversion twofold binomial tree

Real option value interpretation

As regards real option model is a strategic decision making tool, it is not proper to use its result as a single value, rather it is required to construe the result appropriately. As mentioned earlier, Pascal triangular approach gives a good intuition of real option interpretation. To make the approach more clear, as an example consider a project with option to expand, option to contract and option to abandon with initial value of 200 \$ and option value of 27\$. In figure 4 rectangular numbers show nodes with decision to expand project, oval numbers show nodes with decision to contract and lined number displays decision to abandon.

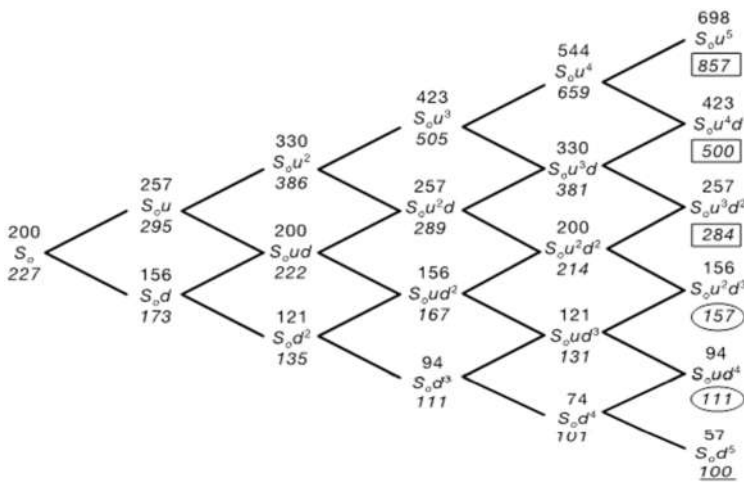


Figure 4a

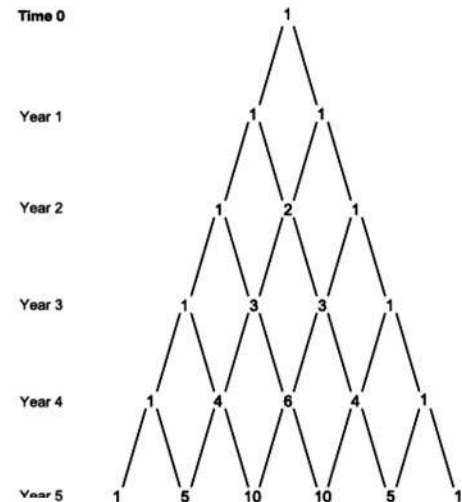


Figure 4b

Figure 4a, binomial tree to choose; 4b, Pascal triangular related to the binomial tree.

As shown in figure, each node related value in Pascal triangular shows the number of paths which end in that node, so the probability of ending with each node is available. Linking these probabilities to the same size of binomial tree, the probability of various future decisions in real option model could be calculated. In this example, the probabilities of each option exercising are as follow:

The number of possible paths after 5 years is 32

Probability of ending with expand decision: $(1+5+10)/32 = 50\%$

Probability of ending with contract option: $(10+5)/32 = 46.9\%$

Probability of abandoning the project: $1/32 = 3.1\%$

Although real option value of a project is an important criterion for decision making, but it is not all the information that could be achieved from real option model. Studying the probability of future strategies, brings good understanding of the project value distinctively in two themes.

1: Required future investment: the required future investment is equal to the expected future cash flow, which results from exercising option. This cash flow could be positive from exercising abandon option or contract option or be negative because of payment of the expand option exercise price. Indeed, the expected future investment information helps managers to construct their portfolio of investments.

2: Stability of project: The final decision of investment, depend greatly on the utility of decision maker. Applying the probabilities in real option model, brings good strategic information about the stability of project and help managers to decide based on their priorities. The stability term here means the chance of continuing project without change or with favorable changes. As an instance, one's priority could be a project with higher real option value, while other may prefer to have a project with stable situation with the aim of staying in the same line of business. Besides, we should be aware that any changes in project have intangible expenses that are not, at least easily, possible to capture by project evaluation methods, such as expense of managers inaction period, which make the stability study of the project more important.

To make discussion more understandable, consider two different projects with the same possible future strategies _options_ and real option values. The first project have probabilities of 60% to continue project without change, 35% to expand project and 5% to abandon project, and the second project's probabilities are, 15% to continue project without change, 60% to expand project and 25% to abandon project. A risk seeking decision maker may choose the second project, due to its high probability of expansion, while a risk averse decision maker may choose the first project because of its trivial probability of abandon.

In decision making process based on real option value, it is also important to notice the effect of volatility and time to maturity on the option value. Increasing volatility cause increase the value of the real option, while entering an uncertain market is not always favorable for managers, and depend on the decision maker's utility. Increase in time to maturity the same as volatility, increase the real option value. Although it is accepted that longer life projects have better chance to be more beneficial (time to maturity effect), but long life project is not often interesting for decision makers, then in this case the priority of managers should be taken into account as well.

Mean reversion multiplex real option in practice, the analysis and interpretation

The suggested model applied in a mining project of deep sea rare metal extraction. The option to expand, option to abandon, option to contract, and defer option recognized as project flexibilities based on its characteristics. The private risk in this project is the quality of extracted material which is provided by geological studies (figure 5). By the fact that this project is classified as high technology project, the leakage rate is small value of 0.5% and grow slowly every year by 15%. In this study, the historical data of Osmium used as a substitute of the intended rare metals (figure 6). To estimate volatility we use GARCH (1,1) model, and apply regression model for mean reversion coefficient assessment.

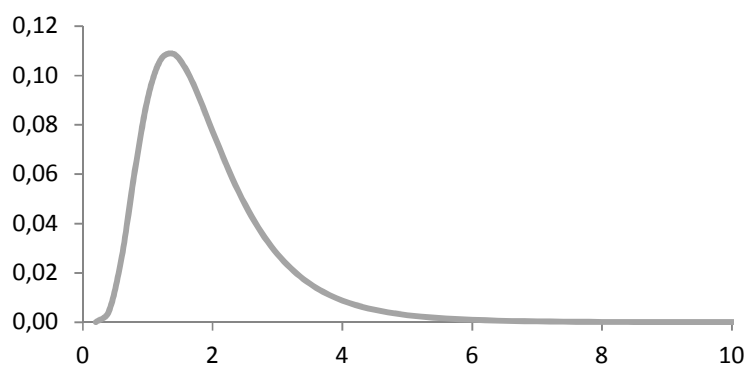


Figure 5: Probability distribution of private uncertainty (the quality of extraction)

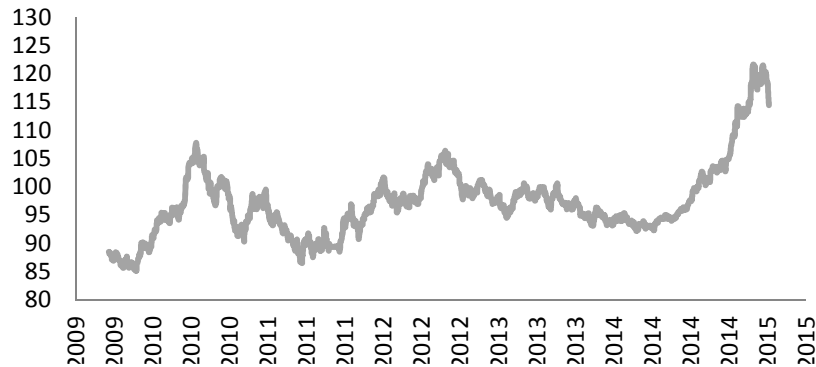


Figure 6: Osmium daily prices information 2009-2015

To convert continues values to discreet ones, several probability points from private uncertainty distribution are chosen (probabilities are chosen per .02). Using the private risk quantity, real option value of each quality calculated and assigned to its probability. These real option values used to approximate the distribution of real option value which shows in figure 7. The expected value of mean reversion real option distribution is equal to 717,492 Mln \$, and the biggest probable real option value is 18646.15 Mln \$. The expected value of GBM real option value is equal to 36630.29 Mln\$ which as it is expected, the real option value with mean reversion process is much less than its value with GBM process (figure 8).

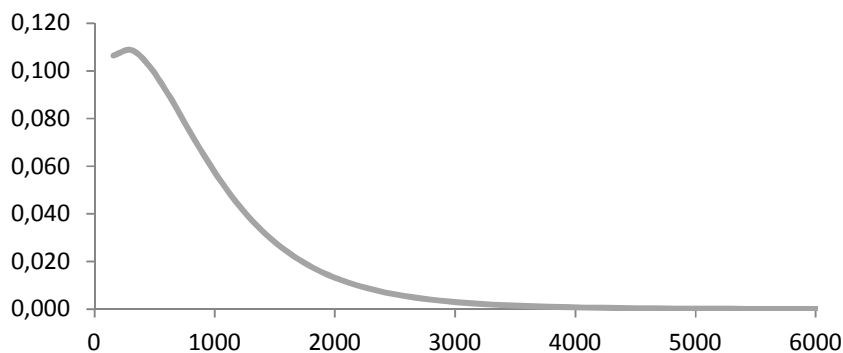


Figure 7: Real option value distribution with mean reversion process

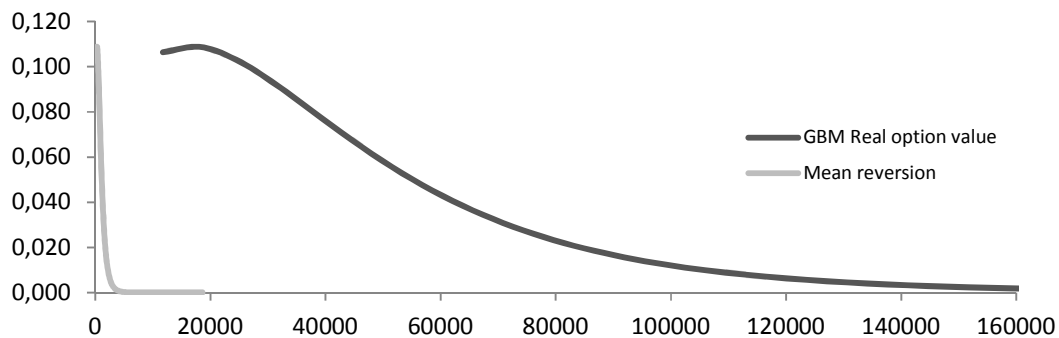


Figure 8: Real option value distribution with mean reversion and GBM process

Based on the Pascal triangular analysis, the probability of decision to expand the project is 96% and the probability of continuing project without change is 4%. The extreme result for expansion probability is due to trivial expansion exercise price and big expansion coefficient factor in this case. This result shows that the project is highly valuable and greatly stable in its future strategy, also it most likely means that manager should consider to start the project with its ultimate capacity. The sensitivity of the real option value based on changes of the exercise price presented in figure 9.

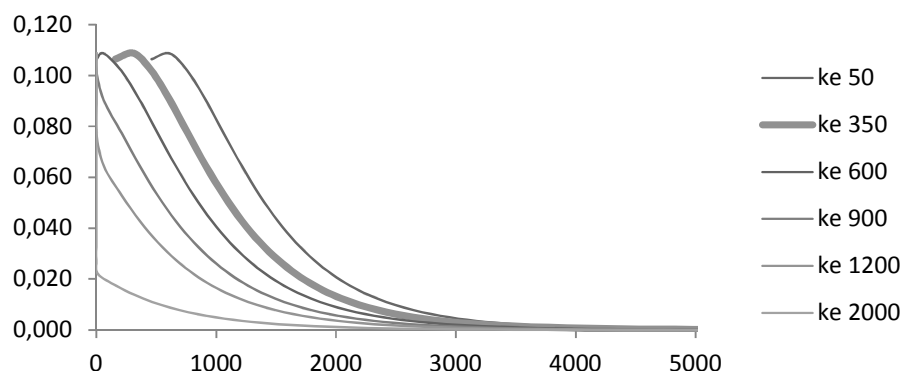


Figure 9: sensitivity of real option distribution value based on changes in expansion exercise price (ke)

The expected future investment is equal to 350 Mln\$ (the expansion exercise price)* 96% (the probability of expansion) = 336 Mln\$ which will occur at the first year.

Although it is not possible to assess the priority of the project alone based on the mentioned hints. Yet, considering that the decision in all the sub-trees are to expand project at the first node of the tree or continue project without exercising any of the available options, it is easy to conclude that the time to maturity did not add value to the final real option value. The same effect is observable for the volatility effect in this project, change in volatility value did not affect the real option value. Then, in this special case, the study of input parameters effect (volatility and time to maturity) is not beneficial.

Conclusion

The aim of this study is to develop a more reliable real option model. To reach this objective, at first the private distribution approach introduced which gives the possibility to analyze the result separated to private risk and market risk, also help to keep all the information of the private risk. The second part of this study investigate manager's flexibility in real option valuation. As respects in real world, managers generally have flexibility to decide about the initial time of project the same time as other options. Therefore, the multiplex mean reversion model, which is able to capture the value of concurrent defer option with other kind of optionality have been studied.

Finally to enhance real option model application in practice by its suitable interpretation, and make strategic decision making based on real option model more clear, the interpretation of real option result discussed in detail, although authors believe that this topic still deserved to be studied more. An extension of this topic could be real option portfolio multi objective decision making (MODM) based on option exercising probabilities and real option value.

References

- Borison, A. (2005). Real Options Analysis: Where Are the Emperor's Clothes? *journal of applied corporate finance* , 17-31.
- C. Okan Özogul, E. Ertugrul Karsak. (2009). A real options approach for evaluation and justification of a hospital information system. *journal of Systems and Software* , 2091-2102.
- D.B Nelson, K.Ramaswamy. (1990). Simple binomial process as diffusion approximation in financial models. *Review of Financial Studies* , 393-430.
- E.S.Schwartz. (1997). The stochastic behavior of commodity prices: Implications for valuation and hedging. *The journal of finance* , 923-973.
- P.Kodukula, C.Papudesu. (2006). *project valuation using Real option*. florida: Ross Publishing, Inc.
- T.Copeland, P. Tufano. (2004). A real-world way to manage real option . *Harvard business review* .
- W.J.Hahn; J.S.Dyer. (2008). Discrete time modeling of mean-reverting stochastic processes for real option valuation. *European journal of operational research* , 534-548.