

THE NEXUS OF ENTERPRISE RISK MANAGEMENT AND VALUE CREATION: A SYSTEMATIC LITERATURE REVIEW

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Abstract. *Enterprise risk management (ERM) has emerged as a new paradigm for managing the portfolio of risks that face organizations and delivers synergic value by exploiting natural hedges. Proponents of ERM claim that ERM is designed to enhance the shareholder value (SHV). Increasing numbers of researchers have studied the impact of ERM on a firms' value (value creation) and found a positive correlation, but ultimately fail to enlighten the entire picture because of the yet to be fully understood field of ERM as well as a missing conceptualization of the nexus between ERM and Value Creation (VC). The literature on ERM is still in a pre-paradigmatic state and executed quantitative studies are too early in the stage of the research field. This study proposes an updated research agenda to examine the nexus of ERM and VC and determines which quality articles and proxies for ERM and VC currently exist in literature. Therefore, the authors systematically reviewed 25 articles regarding the ERM and VC nexus by coding the articles and later using a qualitative thematic analysis. First, the study provides an overview of theoretical background regarding ERM development, frameworks and regulation. Then the authors describe the empirical methodology and introduce the findings of the study. The study found a lack of reliable proxies, authors struggling to find the influencing ERM determinants and, thus, the inability to make a general statement on the value creating effect of ERM programs. Resulting of the findings, the authors proposes the identification of specific components and processes of ERM that contribute to firm value and evaluation of added benefit of ERM, compared to TRM. The authors further suggest the solicitation of a same base and scrutinization of profitability based VC measures towards a cash flow based approach.*

Keywords: *Risk, Finance, Enterprise Risk Management, ERM, Value Creation*

Introduction

Risk management, its processes, its measures as well as its instruments have been playing a major role in financial markets and a company's ability to avoid, reduce, offset or turn risks into opportunities for decades. A newly developed framework revolutionizes traditional silo-based concepts and drives risk management into a comprehensive, strategic and integrated system, called Enterprise Risk Management. Studies find evidence for a connection between the introduction of Enterprise Risk Management (ERM) and an increase in value for the corresponding companies (Hoyt & Liebenberg, 2011; Pagach & Warr, 2010). Based on hypotheses of possible correlations between proxies, such as the introduction of a chief risk officer (CRO) and Shareholder Value (SHV), it is argued in literature that a positive correlation exists and that ERM contributes to Value Creation (VC) (Beasley, Pagach, & Warr, 2007; Pagach & Warr, 2010). However, the studies so far fail to address and explore the actual contributing processes and factors, and literature falls short on finding a more holistic approach. Moreover, after a careful literature review, the authors came to the conclusion that the maturity of the body of knowledge on ERM is still in a pre-paradigmatic state (Kuhn, 1963) and, thus, the mentioned quantitative approaches are too early and may miss some important mediator and moderator variables between ERM and VC (Edmondson & Mcmanus, 2007). Hence, the mentioned studies can only present early evidence for such a connection. Yet many conceptual and explorative articles on the organization of ERM and its possible impact can be identified, presenting a much-varied picture. In an approach, now to identify the existing theories and find the blind spots in literature on the ERM/VC nexus, the authors embark on a qualitative journey of inductively coding existing literature, clustering and, finally, comparing the approaches to the existing body of knowledge on the phenomenon of ERM. Enterprise Risk Management enables firms to manage a wide array of risks in an integrated, enterprise-wide fashion (Hoyt & Liebenberg, 2011). ERM represents a radical paradigm shift from the traditional "silo-based" approach to managing risk holistically in a portfolio (Pagach & Warr, 2010). Studies use ERM synonymous with integrated risk management (IRM), holistic risk management, enterprise-wide risk management and strategic risk management. For consistency, the acronym ERM is used throughout this study. Value Creation includes all types of benefits, creating a better value for shareholders (Gluck, Kaufman, & Walleck, 1980). Much has been written in the fields of Enterprise Risk Management (ERM) and Value Creation (VC). Strategic Management sees Value Creation as the goal of its aggregated activities (Gluck et al., 1980) and ERM is placed in literature as an important variable within the respective causal chain (Meulbroek, 2002). Besides, ERM itself remains largely vaguely defined and unspecific (Miccolis & Shah, 2000b). Approaches from GARP (Global Association of Risk Professionals) (GARP, 2004) and COSO (Committee of Sponsoring Organizations of the Treadway Commission) (COSO, 2004) present ERM as a term for systemic, integrated approach to risk management that differs from traditional container based methods as well as delivers synergic value by exploiting natural hedges and portfolio effects, improve the stability and quality of earnings along with reducing external costs of capital (Meulbroek, 2002; Miccolis & Shah, 2000b; Nocco & Stulz, 2006). Explanatory studies found early evidence of a positive correlation of specific forms of risk management and firm value in form of Shareholder Value (SHV). However, only recently, more empirical studies emerged with a distinct focus on the specific contribution of a firm's overall or enterprise risk management to SHV (Hoyt & Liebenberg, 2011; Pagach & Warr, 2010). Hoyt and

Liebenberg (2011), for example, found a positive relation between firm value and the implementation of ERM. The study is based on publicly traded U.S. insurers (117). In their attempt to identify ERM activities for each firm of the initial sample (275), they encountered difficulties in finding suitable proxies and, therefore, ultimately, their search string for media evidence included “chief risk officer (CRO)” and “risk committee”, being used synonymously for enterprise risk management. Thus, a major obstacle of ERM related research is the difficulty in identifying signals for ERM engagement from publicly available data. Some authors (Beasley, Clune, & Hermanson, 2005; Liebenberg & Hoyt, 2003) determined the creation of a specialized managerial position, the CRO, as an expressive signal. Liebenberg and Hoyt (2003) state the CRO as being responsible for the implementation and coordination of ERM and, therefore, firms appointing CROs are more likely to actually implement a true form of ERM in the definition that was laid out before. Accordingly, Beasley et al (2005) find that the presence of a CRO is associated with a greater stage of ERM adoption. Pagach and Warr (2010) fail to find support for the proposition that ERM contributes to value creation. Although they reveal that some firms adopting ERM actually experience reduction in earnings volatility, overall, they see no significance in value enhancement. As a signal of a firm’s adoption of ERM, they focused on the hiring announcement of enterprise-level or chief risk officers (CRO). They studied (138) announcements of senior risk officers appointments made from 1992 to 2004, whereby the synonym enterprise-wide risk management appeared for the first time only in the Joint Australia / New Zealand Standard for Risk Management in 1995 (AS/NZs, 2004). The study of Beasley et al. (2007) examines the firm-specific equity market reactions surrounding the appointment of a CRO. The univariate result of the study suggests that a general statement about the benefits or costs of implementing ERM is not possible. However, the multivariate analyses reveal a significant relation between the magnitude of market returns and certain firm-specific characteristics. The announcement of a CRO during the period 1992-2003 was used to obtain a sample of (120) firms probably engaged in ERM and they measured abnormal stock market returns occurring on the day of the hiring announcement plus the following day. So this study only measured short-term reactions to the CRO appointment and did not consider that the synonym ERM did not appear before 1995. Beasley et al. (2007) also discusses the view that ERM may in fact be value destroying, when shareholders, according to the modern portfolio theory, are able to costless eliminate idiosyncratic risks through portfolio diversification. Prevalent studies examined the impact of ERM on different value approaches, including firm value determined with Tobin’s Q (Hoyt & Liebenberg, 2011), equity market reactions (Beasley et al., 2007) and long-term firm performance (Pagach & Warr, 2010).

The authors of this thesis claim that recent quantitative empirical studies on the topic, while contributing in examining specific factors, ultimately fail to enlighten the whole picture because of the yet to be fully understood field of ERM and a missing conceptualization of the nexus between ERM and SHV. Many studies, for example, fully relied on the appointment of a CRO as a signal of a firms’ ERM adoption and disregarded confounding ERM activities, such as idiosyncratic risks for their research. More specifically, mixed outcomes concerning a possible correlation of ERM and SHV demonstrate that the underlying model needs to be expanded. Such further scrutinization would also provide further insights not only if, but also how ERM influences SHV. The different levels or stages of ERM programs and their associated longitudinal magnitude of value creation need to be included in such a model. Therefore, it is the opinion of the authors that the researchers’ community needs to take a step backwards and conceptualize further to come up with a

more holistic and dynamic approach. As a result, this article will present an overview of the current state of literature on the ERM / VC nexus and propose a research agenda to address the “blind spots”.

The following four sequential research guidelines were thus created:

- Which quality articles on the nexus of ERM and VC are found to display a highly relevant contribution to the field?
- What schools of thought can be identified, what theoretical background from the ERM side and the VC side can be identified in them?
- What concepts of the ERM literature remain unaddressed in ERM / VC literature so far?
- Proposing an updated research agenda in the field addressing the findings.

Literature Review

Interest in enterprise risk management (ERM) has continued to grow in recent years. A considerable number of organizations have implemented ERM programs, rating agencies have begun to consider ERM in the ratings process, consulting firms have implemented ERM in their services, universities have developed ERM addressing courses and research centres (Hoyt & Liebenberg, 2011). What’s more, in this first theoretical chapter, the authors aim to provide a brief overview on the differences of TRM and ERM as well as some insight into the development of the risk management sector in recent years.

Risk management is traceable to the late 1940s and early 1950s and started as a so-called “silo-based” approach to corporate risk management until the mid-1990s. The “silo-based” approach is also known as Traditional Risk Management (TRM) and is categorized by the management of individual risks in separate units in a highly disaggregated method (Dickinson, 2001). Until the 1990s, there were only the two categories of risks managed, namely “non-financial” and “financial” risks. The “non-financial” or physical risks include natural catastrophes, accidents and hazard, whereby the financial risks market and credit risk contain (Culp, 2002). In the early stages, Traditional Risk Management used merely insurance companies to transfer their non-financial risks. In the 1970s, companies began to look more closely at how they managed various financial risks, such as movements in exchange rates, commodity prices, interest rates and stock prices. Furthermore, financial risk management began, as a formal system, at the same time as the development of financial derivative products, e.g. futures, options and swaps (Dickinson, 2001). Twenty years ago, the responsibility for risk management was split between a risk manager at low-level position, who’s main job was the purchase of insurances and a treasurer responsible for hedging of interest rates and foreign exchange exposure (Nocco & Stulz, 2006). In 2003, even 92% of the world’s 500 largest companies report using derivatives (Smithson & Simkins, 2005). In 1995, the synonym enterprise-wide risk management appeared the first time in the Joint Australia / New Zealand Standard for Risk Management (AS/NZs, 2004). The standard provides the first practical prescription for implementation of ERM using generic examples. So the development toward a more holistic approach began.

The integrated or enterprise-wide approach has advantage over the traditional risk management approach, because it’s not managing one risk at a time on a decentralized basis, which creates inefficiencies because of the lack of coordination between the various

risk management departments, but in a systematically and consistently way. Additionally, ERM enables to identify interdependencies between risks across different sources, enhancing it from the TRM known focus on market and credit risk to operational, reputational and strategic risk, optimize the tradeoff between risk and return and strengthens a company's ability to carry out its strategic plan (Meulbroek, 2002; Nocco & Stulz, 2006). In addition to that, ERM views all risks facing a company through a common lens by harmonization of the variety of instruments, tools and terminology as well as the enterprise-wide view attempt to consolidate the risk management process organizationally across systems, processes and people (Culp, 2002). In 2002, the development towards enterprise-wide risk management obtained further support from the Public Law of Sarbanes Oxley Act (SOA 2002), which led to extensive changes in corporate governance and compliance and is applicable for all US-publicly traded companies. The SOA (2002) contains the requirement to state the responsibility of management for establishing and maintaining an internal control structure and the assessment of the effectiveness of the internal control in each annual report. Furthermore, a regulatory capital framework, known as Basel II, emerged in 2003 and expands risk management requirements for financial institutions to include oversight of operational risks in addition to credit and market risks as part of their capital adequacy determinations (Basel, 2003). In response to these requirements, financial institutions are embracing ERM to manage risks across the entity (Hoyt & Liebenberg, 2011). Not until frameworks and best practices were developed, the new concept of ERM got its updraft. The Casualty Actuarial Society (CAS, 2003) published an overview of ERM and the Joint Australia / New Zealand Standard for Risk Management enhanced its report to an international RM standard ISO 31000 (2009). But probably the 2004 emerged Integrated Framework for Enterprise Risk Management of the Committee of Sponsoring Organizations of the Treadway Commission is best known (COSO, 2004). In 2010, publications of U.S. laws concerning risk management augmented the trend towards ERM further. Moreover, the Dodd Frank Act (Act, 2010) requires financial companies to have a formal risk committee and enterprise-wide risk management program and the New York Stock Exchange Corporate Governance Rules (NYSE, 2009) calls for organizations to disclose details about the board's role in risk oversight.

Fehler! Verweisquelle konnte nicht gefunden werden. The differences between TRM and ERM (adapted from Banham, 2004)

Traditional Risk Management	Enterprise Risk Management
Risk as individual hazards	Risk viewed in context of business strategy
Risk identification and assessment	Risk portfolio development
Focus on discrete risks	Focus on critical risks
Risk mitigation	Risk optimisation
Risk limits	Risk strategy
Risks with no owners	Defined risk responsibilities
Haphazard risk quantification	Monitoring and measurement of risks
"Risk is not my responsibility"	"Risk is everyone's responsibility"

Drivers towards the Enterprise Risk Management

The trend towards the adoption of ERM programs is attributed to a combination of external and internal pressure. Miccolis and Shah (2000a) cite the direct and indirect pressure from corporate governance bodies as well as institutional investors as external driven reason for ERM adoption. However, the literature claims that additional external drivers exist. So a company's ERM adoption is also affected by a broader scope of risks arising from factors, such as globalisation, industry consolidation, regulation and technological progress (Lam, 2001; Miccolis & Shah, 2000b). Dickinson (2001) further mentions the failures of high-profile companies along with the financial crisis as motivating factors to consider ERM. Rating agencies, like, for instance, Standard & Poor's and Moody's, have begun to take account of ERM systems in their rating methodology and, thus, it can be presumed that it's a driving factor for an organization to adopt ERM (Aabo, Fraser, & Simkins, 2005). Internally driven is the desire for an ERM program primarily by an emphasis to maximize shareholder wealth (Lam, 2001; Miccolis & Shah, 2000a). A study from Deloitte (2008) with 151 respondents from Europe, North America and South America found that ERM efforts are being driven, for the most part, by the need to be able to respond effectively to regulation, either because it is required by regulations or because ERM is seen as a means to manage increasingly complex compliance requirements. Additionally, further interest drivers in ERM are 'unanticipated losses', 'market expectation' and 'public image'. The key groups driving ERM from inside an organization are boards and audit committees, followed by internal audit and then senior management (Deloitte, 2008). Figure 1 summarizes the ERM drivers found during the literature review.

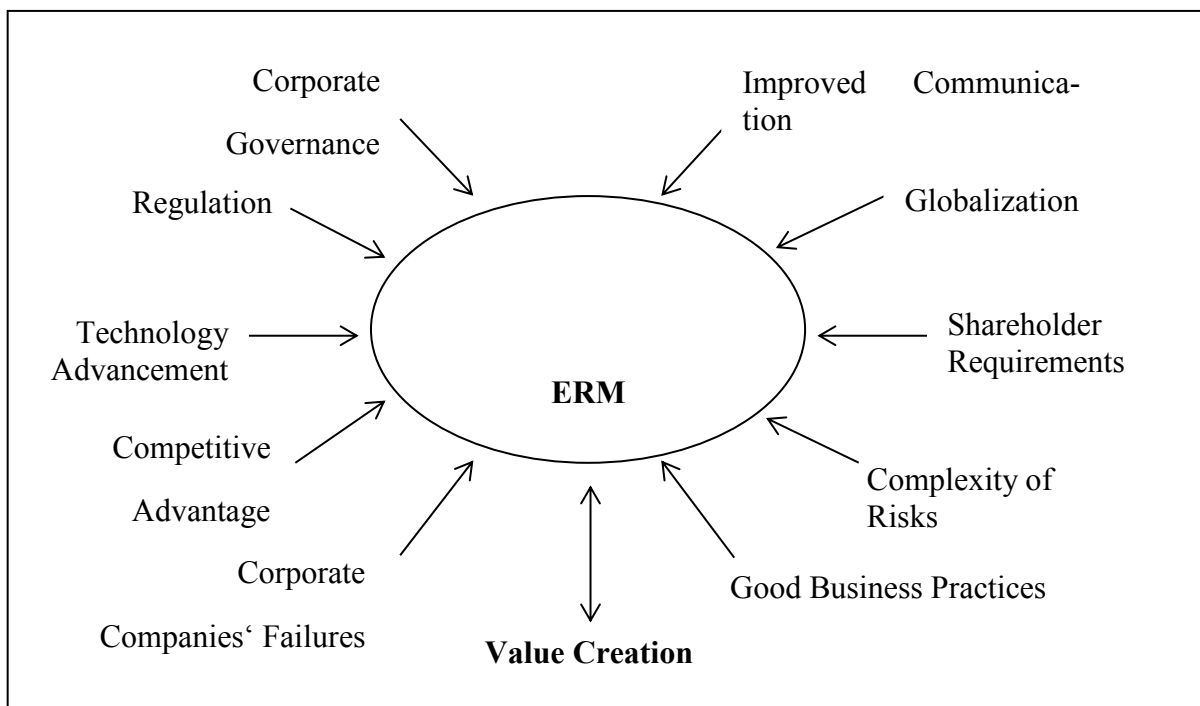


Figure 1: ERM Drivers (adapted from Banham, 2004)

Current State of ERM Adoption

In 2001, a study by the Economist Intelligence Unit (EIU, 2001) found out that 41% of the companies in Europe, North America and Asia had implemented some form of ERM. Beasley et al. (2005) conducted a study on 123 organizations mainly composed of U.S. firms and also international firms in 2004. The authors noted that 50% of the entities in the sample have either partially or completely implemented ERM, 35% have not made a decision to implement ERM or have no plans to implement ERM and 31% of the entities have appointed a CRO. Furthermore, they observed that the US firms have less-developed ERM processes than the international firms in the sample. Firms in banking, education and insurance industries have a more advanced stage of ERM implementation than firms outside these industries (Beasley et al., 2005). A study of Baxter, Bedard, Hoitash, and Yezegel (2011) on 165 U.S. firms in the banking and insurance industry for the period 2006 to 2008 used the S&P Rating database on ERM activities. The study states in its descriptive statistics, that 25% of the sample firms have either strong or excellent S&P RM ratings and only 4% have a weak S&P RM rating (Baxter et al., 2011). Whereas Desender and Lafuente (2010) concentrated on pharmaceutical firms by including 97 U.S. firms of this industry into the study. 39% of firms reported the presence of a CRO in 2004. Additionally, the sample firms indicated that they have adopted on average 33% of the COSO ERM framework (Desender & Lafuente, 2010).

In Canada, a study found on 118 companies from the insurance industry in 2001, that 31% of the sample had adopted ERM, 29% were investigating adopting ERM and 40% were not considering ERM. A large portion of the firms is moving towards ERM. 45 firms are developing company-wide guidelines for risk management; 49% are increasing the awareness of non-operational risks by operational risk management and increasing the awareness of operational risks by non-operational risk management as well as 64% are enhancing the coordination with different areas responsible for risk management (Kleffner, Lee, & McGannon, 2003).

A comprehensive study by Deloitte in 2008 of 151 mid-size companies, with mainly internal auditors and risk manager as respondents, from North America (56), South America (24) and Europe (68) detected a growing interest in ERM (Deloitte, 2008). What's more, the majority of respondents (64% in Europe and 62% in North America) have a higher interest in ERM than they did a year earlier, with South America showing the greatest increase in interest (79%), compared to that of the prior year. Besides, with 56% of companies having an ERM program in place for less than two years, most ERM programs are in relatively early stages of development (Deloitte, 2008). According to the study of Deloitte (2008) Europe is further ahead in ERM deployment, with 43% of companies, which have had an ERM program in place for more than four years. In terms of industry, also differences were identified in the state of ERM adoption. So are telecommunications (38%), life science and health care (34%) as well as energy (24%) more likely to have fully operational ERM programs than other industries (Deloitte, 2008).

One of the latest studies in this concern is the survey of COSO on the current state of ERM in the year 2010 with 460 respondents from U.S. based organizations (COSO, 2010). The findings of the study prove that the level of ERM sophistication still remains fairly immature for most responding to the survey. Around 15% of the respondents described their organization's level of ERM process as "very immature" and 28% as "somewhat im-

mature”. Only 3% responded that their organization’s ERM process was “very mature” (COSO, 2010). So, to get more insight, respondents were asked to pick a statement, which best described their organization’s current stage of ERM implementation. In this case, only 28% of all respondents describe their current stage of ERM implementation as “systematic, robust and repeatable” with regular reporting to the board, while almost 60% of respondents say their risk tracking is mostly informal and ad hoc or only tracked within individual silos or categories as opposed to enterprise-wide. Around 13% indicated that their organization had no structured process for identifying and reporting top risk exposures to the board (COSO, 2010).

Value Creation

Proponents claim that the underlying concept of ERM is to enhance shareholder value and is related to each type of organization, whether profit, non-profit or government agency (COSO, 2004). ERM addresses important business issues, such as growth, return, consistency and value creation (CAS, 2003). Moreover, Liebenberg and Hoyt (2003) stated that unlike the traditional “silo-based” approach to corporate risk management, ERM enables firms to benefit from an integrated approach in managing risk.

The basic premise that ERM is value creating runs counter to the portfolio theory by Markowitz (1952). The portfolio theory assumes that under certain assumptions, shareholders can eliminate idiosyncratic risks in a virtually costless manner through portfolio diversification (Markowitz, 1952). So, the classical finance theory (CFT) distinguishes between systematic (market or beta) risk and idiosyncratic risk (firm-specific or unsystematic) risk, which conclude in a firm’s total risk. Investors can reduce the amount of total risk by two primary risk management tools, namely diversification and asset allocation. The systematic risk is the risk that remains after diversification, but investors can control their exposures to the systematic risk by adjusting their holdings of risky assets or by using futures, forwards or swap contracts (McShane, Nair, & Rustambekov, 2011; Woon, Azizan, & Samad, 2011).

Apparently, the ability of investors to adjust their own risk exposures seems to leave no role for firm-based risk management. Since investors can diversify firm-specific risks, they should not be compensated for bearing such risks. As a result, investors should not value costly attempts by firms to reduce firm-specific risks. Additionally, risk management at the firm level should be a negative net present value project (Meulbroek, 2002; Pagach & Warr, 2010). This view relies on the assumption that capital markets work without frictions, imperfections and asymmetric information. Modigliani and Miller (1958) established that in perfect capital markets capital structure does not affect the market value of the firm. The explanation for how risk reduction can add value must be found in the various market imperfections faced by firms, principally transaction costs, taxes and the costs of financial distress. However, in imperfect capital markets, researchers have suggested that risk management may create value by reducing and / or exploiting market imperfections (Grace, Leverty, Phillips, & Shimpi, 2010).

Another stream of the finance literature argues that firms should not engage in an effort to manage idiosyncratic risk in the context of the capital asset pricing model (CAPM). The reason in this model is that investors are compensated only for bearing systematic (non-diversifiable) risks, but not for bearing idiosyncratic (diversifiable) risks. In other words, a firm’s cost of capital (required rate of return) should depend only on the firm’s

systemic risk, not the total risk of the firm, because investors can eliminate the diversifiable risks of individual firms by holding a well-diversified portfolio. So, the systemic risk of the firm is represented by beta in the CAPM. However, several researchers countered with asset pricing models, in which idiosyncratic risk does matter, for example, because investors may hold undiversified portfolios (McShane et al., 2011).

It can be derived from the above discussion, that the theories by Markowitz (1952) and Modigliani and Miller (1958), in which firm level risk management is a negative present value projects, are disproved. Accordingly, researchers present arguments, under which risk management activities could be value increasing, when agency costs, market imperfections as well as information asymmetries interfere with the operation of perfect capital markets (Nocco & Stulz, 2006).

Based on the argument taken from the value maximization theory of corporate risk management, researchers suggest theoretical concepts of value creation through the implementation of ERM programs by firms. Stulz (1996) argues that a potential value creation role of ERM is to reduce or eliminate the probability of financial distress and, consequently, reducing the effect of “costly lower-tail outcomes“. Lower tail outcomes are primarily negative earnings and cash flow shocks following extreme, negative financial events and can have both direct costs, like, for example, losses and bankruptcy, and indirect costs, such as reputational effects with customers and suppliers. The reduction in lower-tail outcomes can be achieved by reducing the firm’s total risk, which should, in consequence, lead to smoother earnings and cash flow performance. As a result, the ERM adopting firm will experience a reduction in earnings and stock price volatility (Nocco & Stulz, 2006).

The lack of coordination by managing each risk class in separate silos creates inefficiencies. Proponents of ERM argue that by integrating all risk classes, firms are able to avoid duplication of risk management expenditure by exploiting natural hedges (Liebenberg & Hoyt, 2011). A further potential benefit from ERM might be the reduction of expected costs of regulatory scrutiny and monitoring as well as external capital costs because of the improved information about a firm’s risk profile. It enables firms to better inform outsiders about their risk profile and should serve as a signal of their commitment to risk management (Meulbroek, 2002). Additionally, the rating agencies’ focus increased on ERM as part of their financial review. So Standard & Poor’s announced that risk management will become a separate category for its analysis (S&P Standard&Poor’s, 2006).

Firms that engage in ERM have a better understanding in aggregate risk inherent in different business activities. This should in turn provide them with a more objective basis for resource allocation and, thus, improving capital efficiency and return on equity. ERM also creates value by reducing a company’s tax burden and by smoothing out cash flow volatility. ERM can also help to ensure that the firm will be able to fund profitable projects internally (Meulbroek, 2002).

Woon et al. (2011) developed a model to capture the causal relationship of ERM implementation and the enhancement of shareholder value. The authors consider this model as very useful to define the term value creation for this study.

The implementation of an ERM program will lead to tangible and intangible benefits for the firm. These benefits include outcomes, like optimizing risk / return profile of the company, reducing earning volatility, strengthening the management’s confidence in business operations and risk monitoring, creating smooth governance procedures, enriching corporate reputation, improving clarity of organization-wide decision making and chain of command, encouraging corporate entrepreneurship and boosting the enterprise’s profitability.

ity. As a result of the ERM program implementation, all the tangible and intangible benefits will then lead to lower cost of capital and / or contribute to firm performance. This relationship represents the value creation from the ERM program and is illustrated in Figure 2 (Woon et al., 2011).

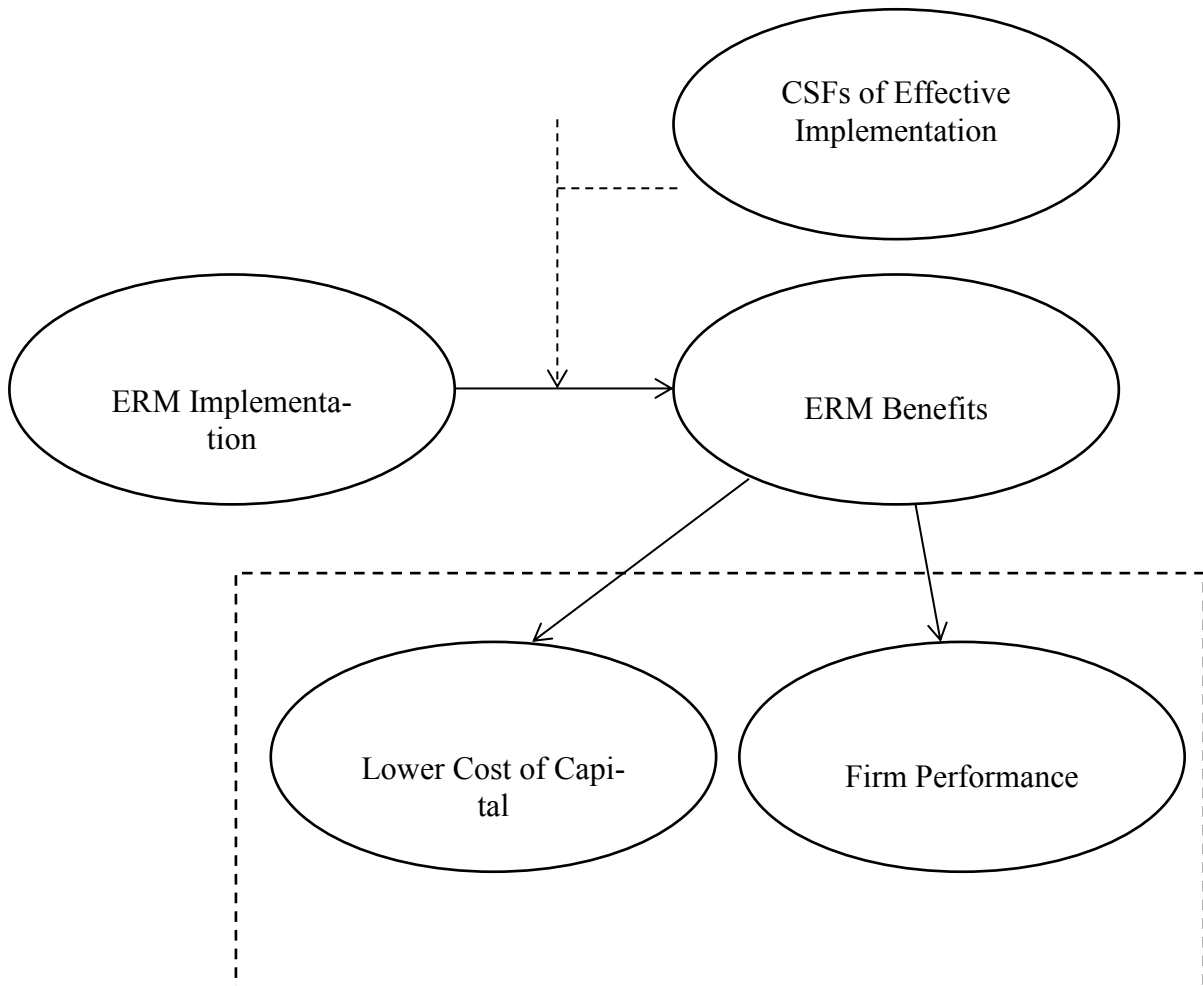
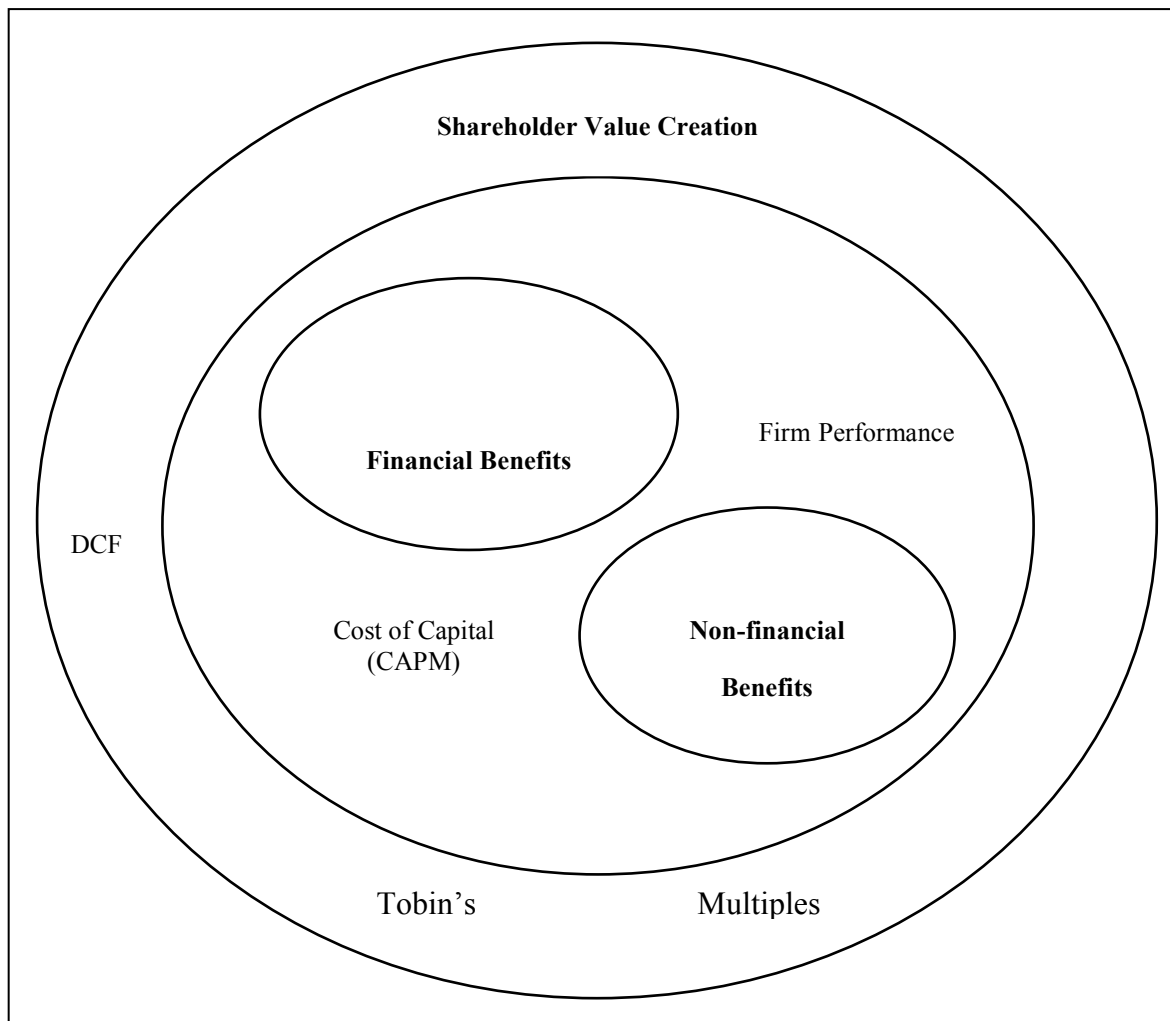


Figure 2: Path Diagram of Causal Relationship ERM and SHV (adapted from Woon et al., 2011)

While there are theoretical reasons, why ERM may increase or decrease shareholder value, according to Beasley et al. (2007) says that these reasons may depend upon the characteristics of the individual firm, suggesting that a definitive statement about the benefits or costs of ERM is not possible. Woon et al. (2011) state that the effective implementation depends on some critical success factors (CSFs) during the implementation phase of such programs. Hence, the authors also consider articles elaborating the factors associated with ERM implementation as useful for this study.

In essence, academics argue that ERM benefits firms by increasing return on equity, growth, decreasing earnings and stock-price volatility, reducing external capital costs, increasing capital efficiency and creating synergies between different risk management activities (Lam, 2001; Miccolis & Shah, 2000a). However, ERM drives value creation not only in terms of financial aspects, but also in non-financial aspects. ERM, for example, increas-



es the risk awareness, which facilitates better operational and strategic decision making (Stroh, 2005). Regarding this study, the authors decided to develop a concept to define the

Figure 3: Concept used for Value Creation

term 'value creation', involving all the discussed aspects from financial to non-financial benefits, leading to lower costs of capital and increasing firm performance resulting in an increased shareholder value. For a better overview, the concept used is illustrated in Figure 3. An improved price-to-earnings ratio or return on asset or equity influences the firm's performance, whereby the lowering of cost of capital is due to risk premium reduction as a result in the firm lowering its idiosyncratic risk and better capital efficiency (Woon et al., 2011). In literature, Tobin's Q is often used as proxy for firm value (Chung & Pruitt, 1994; Hoyt & Liebenberg, 2011). The discounted cash flow method and multiples using price-to-earnings ratio or Return on Asset (ROA) is generally accepted to measure the shareholder value of a firm (Rappaport, 1998).

Data, Sample and Method

For the selection of articles used in the analysis, the authors reviewed academic peer-reviewed journals that are included in the Social Science Citation Index (SSCI), an interdisciplinary database that covers citations from about 1.950 leading journals of social sciences. The authors selected articles from this database Mai 2012 and included all papers published between 1998 and 2012. The advanced search term was TS (= “enterprise risk management” SAME “value creation”). The search came up with only few articles. So, to increase the scale and scope and to provide a more comprehensive collection of this field, the authors subsequently worked out additional search terms inductively and extended the search onto current literature on ERM and Value Creation from journals that were cited in the previously found papers from the SSCI. Additional search terms, such as “Integrated Risk Management” or “Holistic Risk Management” as synonyms for ERM and “Benefits” or “Firm Performance” as synonyms for Value Creation were identified and used. Furthermore, high quality conference papers, electronic articles, monographs, reports, standards and working papers from research or professional membership organizations or initiatives for ERM from searches in additional databases, like, for instance, EBSCO, LexisNexis, Sage Premier and Science Direct were included. At this stage, two major streams of research have been developed around ERM. The first stream focuses on the influence of ERM on firm performance (e. g. (Hoyt & Liebenberg, 2011; Nocco & Stulz, 2006), while a second stream studies the implementation of ERM (Beasley et al., 2005; Kleffner et al., 2003). Hence, to embrace the significant criteria for the level of ERM maturity and the firm specific characteristics enhancing an ERM’s performance, the authors decided to extend the search term to “Enterprise Risk Management” SAME “Implementation” or “Adoption”. Such an approach seems especially important in nascent research fields, as there are many journals on that topic that are too young to be included in any quality list but otherwise provide many hidden gems on the topic and there is no common definition on terms.

In total, there were N=70 papers included in this review. All articles in this selection were then evaluated, whether any substantial focus on ERM / VC or ERM / Implementation could be found. Hence, 28 articles had to be removed from further analysis, either due to a lack of an ERM / VC and ERM / Implementation attention or because of the fact that these articles used synonyms of ERM, such as Corporate Risk Management in their title, but after additional investigation, the focus on a more silo-based than a holistic view became apparent. From the remaining 42 articles, three articles did not meet the scientific requirements and had to be eliminated. From these 39 articles, the authors determined 21 articles covering the factors associated with ERM adoption and 25 articles (some articles cover both areas) with a focus on the nexus of ERM and VC, which are the basis for the qualitative analysis.

So the final sample resulted in 25 relevant articles (n=25) and these papers were then subsequently codified to detect research framework, data set, the definition of ERM, possible proxies, the definition of VC, specific linkage between ERM and VC, research outcome and limitations. The data analysis included the individual paper analysis and the cross-paper comparison within categories (see table 1) and was carried out, based on the technique of the thematic analysis (Boyatzis, 1998; Denzin & Lincoln, 2005), which was applied for this study. Due to the lacking profound theory to date, the thematic analysis was inductively conducted to identify the missing links in the literature. Through constantly going back and forth between the papers, emerging codes were identified and applied in

a reflective and recursive manner. A clustering analysis was conducted to identify existing theories and later compared to conceptualizations of ERM in literature. While the authors is aware that neither the search, nor the evaluation and coding process can guarantee that all possibly relevant articles were found and / or identified, the actual number of papers included and the variety of frameworks that were found make it safe to claim some validity and allow for a cautious generalization of the findings.

Figure 4 summarizes and illustrates the method used and processes followed in the study.

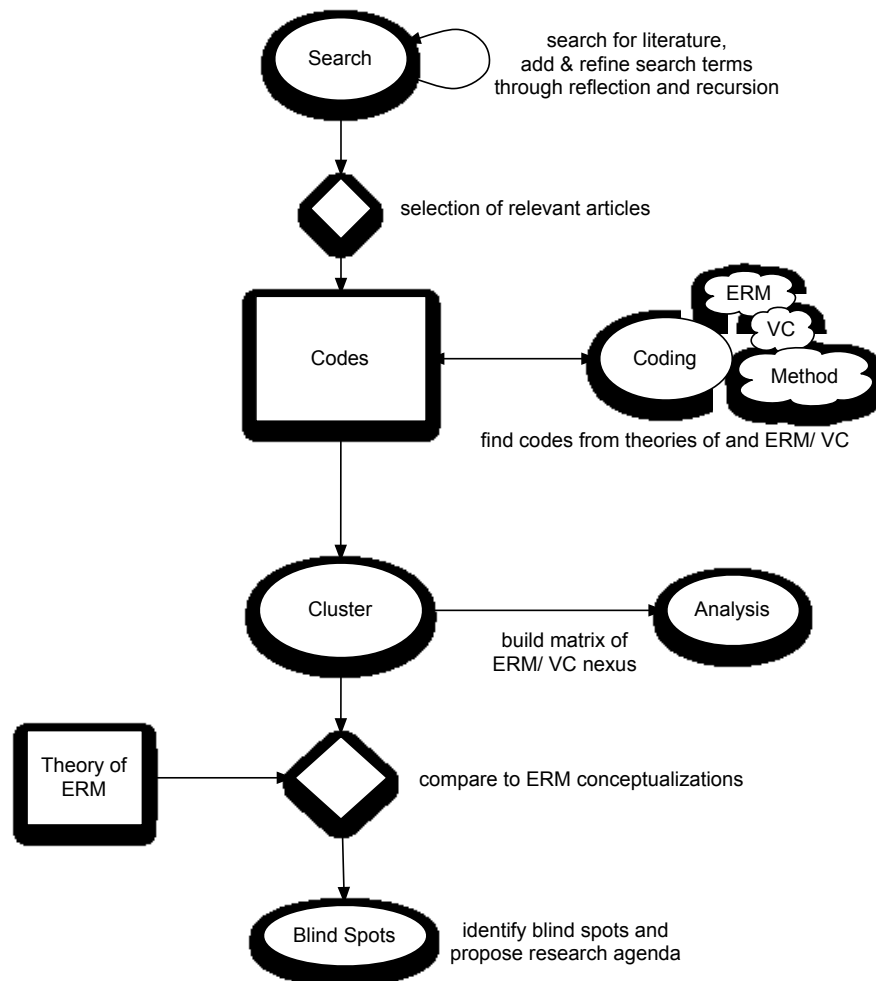


Figure 4: Method flow Source (Lehner, 2012)

Analysis of Articles

Categories for Thematic Analysis

In Table 1, the definition of the code categories and their description, which determines the requirements for an allocation to a particular category, are illustrated.

Table 1: Categories for Thematic Analysis

Variable	Description
Definition for ERM	Which concepts and frameworks were used in the study to define Enterprise Risk Management?
ERM Variable	What search strings were applied to identify the usage of an Enterprise Risk Management system in a company?
Research Framework	What were the paradigmatic assumptions of ontology, epistemology, methodology, and ethics, in the study?
Dataset for Empirical Analysis	Where did the source of data come from and what was the end value used for the study?
Definition for Value	How was the impact of Enterprise Risk Management on Value Creation defined and measured?
Linkage to Theories of ERM / Value Creation	Can a specific linkage of established theories, views or schools of thought in ERM to VC be found?
Outcome	What are the conclusions of the study?
Limitations	Which limitations are presented by the authors?

Table 8: Categories 'Area' and 'Sub-Area'

Areas	Sub Areas
Traditional Risk Management (TRM)	Traditional Risk Management (TRM)
	Connex TRM and VC
ERM practices	ERM review & techniques
	Guidelines for ERM implementation
Determinants of ERM adoption	Drivers ERM adoption
	Factors associated with extent of ERM implementation
	State of implementation
Valuation Effect of ERM	Impact of ERM on VC
	Connex maturity level of ERM on VC

In order to detect the ‘Amount of Secondary Citations’ for each article, Harzing (2007) software to analyse academic citations was used. In total, 70 articles were included in the review. Due to constraints, only 25 of them were considered in particular as ‘**Relevant for**

Study’. The authors established an index to determine the relevance of each article for this particular study. Based upon a journal publishing quality criteria, as well as an intrinsic consideration on ERM literature, the authors came out with a new index. The index was developed during the constantly re-reading of the articles to get information about the importance of each of the categories. The weight of each category was determined in accordance to the research purpose and guidelines. Articles published in journals are rated higher than electronic articles, reports, working papers or conference papers. The higher a journal article is rated in the ABS list (2005), the higher is its relevance for this study. The evaluation of an article is also positively associated with the amount of secondary citations (Harzing, 2007). The purpose of this study is to review the current state of literature on the connex of ERM and VC; therefore an article’s rating increases when ERM and VC proxies are defined. Quantitative or mixed studies with in-depth statistical analysis are valued higher than qualitative studies including case study and open-ended questionnaires without detailed text analysis, and these are in turn valued higher than literature reviews with only illustrative examples. The amount of case studies, observations or interviews is also positively associated with the rating received by the article. In Table 2 the Relevance index is illustrated in detail.

Table 2: Relevance Index

Category	Weight &Evaluation
Reference Type	15%
Journal Article	100%
Conference Paper	50%
Electronic Article	50%
Report/ Monographs	50%
Working Paper/ Discussion Paper	50%
Journal Quality	15%
Not in ABS list or not a journal article	0%
Quality > = 3	100%
Quality = 2	75%
Quality = 1	50%

Amount Secondary Citations	15%
0	0%
1 – 5	20%
6 – 15	40%
16 – 25	60%
26 – 50	80%
> 50	100%
Proxies ERM	15%
Not defined	0%
ERM proxy defined	100%
Proxy VC	15%
Not defined	0%
VC proxy defined	100%
Research Framework	15%
Literature review/ illustrative examples & description of content	25%
case study & description of content	75%
open-ended questionnaire & description of content	75%
survey research & description	50%
survey research (close-ended questionnaire OR secondary data) & statistical analysis	100%
Mixed research (survey + case studies) & statistical	100%
Data Set	10%
Few & various Articles	10%
One case study in deep	80%
Survey research with 1 – 25 respondents	20%
Survey research with 26 – 60 respondents	40%

Survey research with 61 – 100 respondents	60%
Survey research with 101 – 150 respondents	80%
Survey research with > 150 respondents	100%
Amount respondents not stated	0%
Total achievable	100%

Reflection

Within the context of this study, articles with the purpose to define the determinants of ERM adoption were reviewed. The authors was able to detect 20 articles (some of them also focus on ERM and VC and are included in the subsequent coding) examining factors associated with an ERM implementation. In this chapter the findings of these studies are presented in a qualitative description. The studies were primarily conducted as quantitative studies in form of surveys using secondary data, questionnaire and statistical analysis (Kleffner et al., 2003; Liebenberg & Hoyt, 2003; Pagach & Warr, 2011). A focus on North American companies and especially the U.S. insurance industry became apparent in the majority of the studies (Beasley et al., 2005; Desender, 2007). A smaller part of the studies concentrated its research on European firms (Altuntas, Berry-Stölzle, & Hoyt, 2011).

In order to determine a company using an ERM program, different proxies were used. The by far most used proxy was the hiring announcement of a Chief Risk Officer (CRO) or in general the search of keywords like ‘Enterprise Risk Management’, ‘Strategic Risk Management’, ‘Holistic Risk Management’, ‘Corporate Risk Management’, ‘Risk Committee’ or Enterprise Risk Officer’ (Liebenberg & Hoyt, 2003; Pagach & Warr, 2011). Some authors also used advanced proxies for their search. The Risk Management Quality Scale by Standard & Poor enabled the researchers to classify a company’s Risk Management into different stages, from a more silo-based approach to a fully integrated approach (Baxter et al., 2011). Some authors used a closed-ended questionnaire with a definition of COSO’s ERM Framework and asked the participants to determine on a scale the level of the company’s ERM program (Waweru & Kisaka, 2011).

Basically two topics emerged out of the review: the characteristics of a typical ERM user and the factors associated with the extent of ERM implementation.

Firm Characteristics

Various studies claim that an ERM user is larger (Beasley et al., 2007; Hoyt & Liebenberg, 2011; Klumpes, Wang, Tang, & Abhyankar, 2011; Liebenberg & Hoyt, 2003; Pagach & Warr, 2011), has a lower cash ratio (Pagach & Warr, 2007, 2011) and is more levered (Hoyt & Liebenberg, 2011; Klumpes et al., 2011; Pagach & Warr, 2011). Hoyt and Liebenberg (2011) found that companies with an integrated ERM program have less financial slack. ERM using companies also show a significant higher level of institutional ownership (Hoyt & Liebenberg, 2011; Pagach & Warr, 2007, 2011), but are less likely to be publicly owned (Altuntas et al., 2011).

Regarding volatility, different streams were ascertainable, Hoyt and Liebenberg (2011); (Klumpes et al., 2011; Pagach & Warr, 2011) found that ERM users are less vola-

tile, have less stock return and also less cash flow volatility, whereby Pagach and Warr (2007) claim that ERM firms have higher earnings volatility and less stock price volatility.

Beasley et al. (2007) presume that firms which are more likely to benefit from an ERM program are also more likely to adopt one. As a consequence, larger firms are not only more likely to adopt ERM but also more likely to benefit from the program (Klumpes et al., 2011; Lin, Wen, & Yu, 2011; Pagach & Warr, 2007, 2011).

Additionally, there are several other firm characteristics leading to an extended likelihood of a company to adopt an ERM program, for example firms with greater financial leverage (Liebenberg & Hoyt, 2003; Pagach & Warr, 2007), with a higher institutional ownership and higher market-to-book ratio are more likely to adopt ERM (Pagach & Warr, 2011). Whereas the typical ERM user is supposed to have a lower earnings volatility, firms have a higher cash flow and stock return volatility before implementing ERM (Pagach & Warr, 2007, 2011). Firms with changes in past performance (Altuntas et al., 2011) and firms with a better credit rating are more likely to adopt ERM (Kleffner et al., 2003). Kleffner et al. (2003) are also the only ones who found differences in the likelihood of adopting an ERM program dependent on the industry, so as energy firms are more likely to adopt an integrated RM program.

So far the authors discussed the positive relations of firm characteristics and ERM program, but other studies show which factors have no significant impact on the adoption of ERM programs. So found Beasley et al. (2007) that the capital structure has no impact, Pagach and Warr (2007) found that the extent of financial slack has also no influence and Liebenberg and Hoyt (2003) claim that also ownership characteristics show no significant relationship. Whereby some authors assume that firms with more growth opportunities would value an ERM program higher, Beasley et al. (2007); Liebenberg and Hoyt (2003) weren't able to find evidence of this assumption.

Factors associated with Extent of ERM Implementation

The hypotheses that a higher level of ERM implementation is positively associated with the presence of a CRO or risk champion and the entity's size is verified by various authors (Baxter et al., 2011; Beasley et al., 2005; Paape & Speklé, 2012; Saeidi, Sofian, Rasid, & Saeid, 2012; Waweru & Kisaka, 2011).

Beasley et al. (2005); Desender and Lafuente (2009) were able to ascertain a positive association between board independence and ERM level, while Desender (2007); Waweru and Kisaka (2011) disagreed and found a negative association. It emerged that a company can achieve a higher maturity of its ERM program with the support of a CEO and a CFO and with a separation of a CEO and chairman (Beasley et al., 2005; Desender, 2007). Whereby Desender and Lafuente (2009) claim that the separation of a CEO and a chairman has no influence on the maturity level. Studies show that the use of a Big Four auditor is positively associated with the ERM level (Beasley et al., 2005; Desender & Lafuente, 2009), whereby Paape and Speklé (2012) say that the institution's auditor has no impact on the maturity level. (Paape & Speklé, 2012) also found that the presence of an audit committee is positive related, but Desender and Lafuente (2009) on the other side believe that the size of the audit committee has no impact on the maturity level. Only few studies examined the influence of different industries, but findings show that companies in the financial industry have a higher level of ERM (Paape & Speklé, 2012), and also companies in the banking, insurance and education sector have a better developed ERM program in place than companies in other industries (Beasley et al., 2005).

Valuation Effect of ERM

On the following pages the authors presents the table comprising the outcome of the first step in the systematic literature review. By the use of the previously developed template, consisting of six mentioned code categories and the code manual for research framework, substantial content from literature addressing the valuation effect of ERM emerged. Based on the first extraction of main content, the authors were further able to address the sub coding within the code categories.

THE NEXUS OF ENTERPRISE RISK MANAGEMENT AND VALUE CREATION

Title							
Authors	Year	Reference Type	Data Source	Sub Area	Journal Quality	2nd Citation	Relevance
Synonyms for ERM (when provided)							
Purpose	ERM Definition		Variables for ERM	Research Framework	Data Set (End Value & Data Source)		
Value Definition (Proxies for VC)	Linkage to Theories of ERM/Value Creation		Outcome			Limitation	

Information Conveyed in Hiring Announcements of Senior Executives Overseeing Enterprise-Wide Risk Management Processes (Beasley et al., 2007)

Beasley, Mark S.							
Pagach, Don	2007	Journal Article	Journal of Accounting, Auditing and Finance	Impact of ERM on VC	3	33	95.00%
Warr, Richard							
Examination of equity market reactions to announcements of senior executive officers appointments and the impact of firm-specific characteristics on the magnitude of equity market response	A process of analysing the portfolio of risks facing the enterprise to ensure that the combined effect of such risks is within an acceptable tolerance; a holistic, top-down approach to manage risks across the enterprise (Kleffner et al., 2003) and designed to ensure that the entity's risk profile is within the stakeholders' risk tolerances (Beasley et al., 2005), while protecting and enhancing shareholder value (COSO, 2004)		Appointment of a CRO or equivalent as signal adoption of ERM; search string contained "announced", "named", or "appointed" in conjunction with position descriptions of "chief risk officer" or "risk management"	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data (database); Method of data analysis = statistical (univariate and multivariate regression model)	120 public listed companies with CRO announcements from 1992-2003 in U.S. (CRO announcements from business library LEXIS-NEXIS); sample concentrated in three industries: financial services (39.2%; n=47), non-financial (n=73, insurance 12.5% and energy services 20.0%)		

Stock market reaction surrounding the appointment of a CRO measured by cumulative abnormal return (event period as the day of the hiring announcement plus the following day; the abnormal return is computed using a three factor market model estimated over the -255 to -46 day window prior to the announcement; three factors: market return proxied by the CRSP equally weighted index, book-to-market and size)	No specific linkage between ERM theories and VC found	Univariate average two-day market response is not significant, a general statement about the benefit or cost of ERM is not possible; Multivariate analysis: <u>in general</u> : firms with large cash reserves are less likely to benefit from ERM, the extent of growth opportunities, holdings of intangible assets, recent earnings volatility and capital structure have no impact on value creation, larger firms are more likely to benefit from ERM; <u>financial-firms</u> : firms with less cash and more leverage are more likely to see benefits from ERM, reduction in beta is associated with a positive price reaction; non-financial firms: market returns are positively associated with the firm's prior earnings volatility and size, negatively associated with the extent of cash on hand and leverage, no statistical association between returns and the firm's growth, extent of intangible assets, or change in beta; results suggest: costs and benefits of ERM are firm-specific	Use of CRO appointments as signal for ERM adoption might be biased, e.g. CRO appointment is a replacement of an existing CRO or a title change (manager has already been engaged in ERM); unable to directly observe the extent of ERM; capture of only short-term reactions to CRO announcements; no consideration of ERM's value to other stakeholders; issue of managerial characteristics on ERM adoption is not addressed
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Enterprise risk management and firm performance: A contingency perspective (Gordon, Loeb, & Tseng, 2009)

Gordon, Lawrence A. Loeb, Martin P. Tseng, Chih-Yang	2009	Journal Article	Journal of Accounting and Public Policy	Firm specific impact of ERM on VC	3	21	92.00%
Examination of the relation between ERM and firm performance argument that ERM is related to firm performance and that the ERM-firm performance relation is contingent upon the appropriate match between a firm's ERM system and key firm-specific factors	ERM overview -Casualty Actuarial Society: <i>"The discipline by which an organization in an industry assesses, controls, exploits, finances, and monitors risks from all sources for the purpose of increasing the organization's short-and long-term value to its stakeholders"</i> (CAS, 2003); ERM - Integrated Framework: <i>"A process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives"</i> (COSO, 2004)		Two variables: ERM Keywords: "Enterprise risk management", "Strategic Risk Management", "Corporate Risk Management", "Risk Management Committee", "Risk Committee", "Chief Risk Officer" AND COSO ERM effectiveness index: index to measure the effectiveness of a firm's ERM based on its ability to achieve its strategy, operations, reporting, and compliance objectives; indicators measures achievement of objectives by: Strategy1 = more sales by firm relative to the industry's average sales; Strategy2 = a firm's reduction in its beta, relative to the other firms in the same industry; Operation1 = operating efficiency by turnover of assets; Operation2 = input-output ratio; Reporting1 = poor reporting reliability (measured by combination of Material Weakness, Qualified Auditor Opinion, and Restatement); Reporting2 = absolute value of abnormal accruals; Compliance1 = proportion of auditor's fees to	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data (database); Method of data analysis = statistical (univariate tests, regression model, robustness check)	112 US firms identified (mainly utility, financial trading, business service, insurance industry) as using ERM derived from US Security and Exchange Commission's EDGAR database based on search in disclosed ERM activities in 10K and/or 10Q reports for 2005; Data for firm performance and firm-specific factors obtained from the Compustat database		

THE NEXUS OF ENTERPRISE RISK MANAGEMENT AND VALUE CREATION

		net sales revenue; Compliance2 =settlement net gains (losses) over total assets		
Firm performance measured by the one-year excess stock market return (risk-adjusted) to shareholders for 2005	Proper match between effectiveness of ERM, measured by the developed ERM index, the ERM index (effectiveness) is based on its ability to achieve COSO's four objectives relative to strategy, operations, reporting, and compliance	Confirmation of positive relation between ERM and firm performance; relation is contingent upon the appropriate match between a firm's ERM system and the five factors: environmental uncertainty, industry competition, firm size, firm complexity, and monitoring by the board of directors; findings are robust to such concerns as the self-selection problem, the effectiveness of a newly constructed ERM Index, different measures for monitoring by the firm's board of directors, and different measures for firm performance	Study only covers data from 2005; only one-year excess stock market returns to measure firm performance are used; a theoretical model describing which contingency variables should be considered in studies like this one does not exist	

The Value of Enterprise Risk Management (Hoyt & Liebenberg, 2011)

Hoyt, Robert E. Liebenberg, Andre P.	2011	Journal Article	Journal of Risk and Insurance	Impact of ERM on VC	2	32	91.25%
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Integrated Risk Management, Holistic Risk Management, Strategic Risk Management, enterprise-wide Risk Management

Measurement of the extent to which specific firms have implemented ERM programs and the value implications of these programs	Management of a wide array of risks in an integrated, enterprise-wide fashion	Keyword search: "Enterprise Risk Management", "Chief Risk Officer", "Risk Committee", "Strategic Risk management", "Consolidated Risk Management", "Holistic Risk Management", "Integrated Risk Management"	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data; Method of data analysis = statistical (univariate results, maximum-likelihood treatment effects model)	117 publicly traded U.S. insurers drawn from CRSP/Compustat database for the period 1998-2005 (SIC Code 6311 and 6399); 687 firm-year observations for the 8- year period
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Tobin's Q as the market value of equity plus the book value of liabilities divided by the book value of assets	No specific linkage between ERM theories and VC found	Univariate result: value of Tobin's Q is higher for firms with ERM (approx. 4%); ERM user is larger, less leveraged, less opaque, has less financial slack, lower return volatility, higher levels of institutional ownership and relies less on reinsurance than the average nonuser; Results maximum-likelihood treatment effects model: variables Size, Leverage, Opacity, Institutions, Reinsurance, Value Change, Diversification International and Life are significantly related to ERM engagement; Insurers engaged in ERM are valued higher (approximately 20%) than other insurers	Relatively small sample size and inability to measure the intensity of ERM usage
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Does Enterprise Risk Management Add Value? (McShane et al., 2011)

McShan, Michael K. Nair, Anil Rustambekov, Elzotbek	2011	Journal Article	Journal of Accounting, Auditing and Finance	Connex maturity level of ERM and VC	3	5	84.00%
Investigation of the relationship between the degree of implementation of ERM implementation and firm performance, using Standard and Poor's newly available risk management rating	Coordinated management of all risks faced by a firm, whether it is risk related to corporate governance, auditing, supply chains, distribution systems, IT, or human resources.		Standard & Poor's RM Quality Scale: five categories, three TRM levels ('weak' = lacks reliable loss control systems, 'adequate' = still be managing risks in silos, 'adequate with a positive trend' = still lacks a well-developed process for making coordinated risk/reward decisions) and two ERM levels ('strong' = beyond silo RM to deal with risks in a coordinated approach, well-developed risk-control processes and a focus on optimizing risk-adjusted returns; 'excellent' = even further in implementation) as a proxy for degree of RM implementation (adapted from Standard&Poor's, 2006)	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data; method of data analysis = statistical (descriptive statistics, multivariate tests)	82 publicly traded U.S. insurers for which S&P released 2008 an ERM rating; data for control variables and Tobin's Q obtained from Thomson Banker One databases from 2008		
Tobin's Q as the market value of equity plus the book value of liabilities divided by the book value of assets	No specific linkage between ERM theories and VC found	Descriptive results: positive relationship between ERM rating (even a peak for 'adequate with a positive trend' and 'strong' ERM rating) and firm value; Multivariate results: results indicate a positive relationship between "ERM rating" and firm value as the value increases over the first three categories ('weak', 'adequate' and 'adequate with a positive trend') —the first three categories are indicative of increasing levels of TRM—but no additional increase in firm value as the rating moves beyond TRM into what is considered as			S&P provides these separate ERM assessment ratings only for insurance companies, a generalization of the results outside the industry is not possible		

			ERM ('strong' and 'excellent' ERM rating)	
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Incorporating Strategic Risk into Enterprise Risk Management: A Survey of Current Corporate Practice (Gates, 2006)

Gates, Stephen	2006	Journal Article	Journal of Applied Corporate Finance	Connex maturity level of ERM and VC	2	36	78.25%
Investigating the forces behind the push for a more organized and integrated management of significant risks, the challenges to implement ERM and the effect of ERM on the company's ability to implement its strategy	ERM is a board-supervised process that aims to identify, evaluate, and manage all major corporate risks in an integrated framework		ERM stages: Pre-contemplation (never considered ERM); Nay-sayers (considered ERM and rejected it or between contemplation and rejection); Positively-disposed (becoming aware of need for ERM or between contemplation and preparing for action); Preparers; Developers / Implementers (actively in process); Monitors of implemented ERM systems	Research design = mixed; Paradigm = Pragmatism; Methodology = sequential (survey + case studies); Method of data collection = Questionnaire (open-ended & close-ended); Method of data analysis = description of content & statistical	271 financial and risk executives of member companies of the Conference Board in 2004 (64% North America, 28% Continental Europe, 11% U.K.; industry: 28% manufacturing, 16% financial services, 14% professional services, 10% wholesale and retail trade), 5 in-deep case studies		
Not defined ahead		Companies with ERM integrated into strategic planning, annual budget process, stakeholder communications, management scorecards and remuneration experience better-informed decisions, greater mgmt. consensus, increased mgmt. accountability, smoother governance practices, ability to meet strategic goals, better communication to board	Drivers of ERM implementation: Corporate governance requirements; greater understanding of strategic and operating risks; regulatory pressures, including rating agencies; board request; competitive advantage; Implementation process: 1. risk inventory and assessment activities, 2. introduce ERM framework and methodology in major operating unit first as a pilot; 3. install and operationalize ERM processes throughout the company, from strategic planning process to business processes, 4. apply ERM framework when entering new businesses and making other major investment decisions, 5. reinforce accountability by integrating RM with individual performance plans in a number of business units; Companies with advanced ERM experience greater benefits: Better-informed decisions, greater management consensus, increased corporate governance practices, ability to meet strategic goals, better communication to board, reduced earnings volatility	No limitation stated			

The role of strategic enterprise risk management and organizational flexibility in easing new regulatory compliance (Vicky Arnold, Benford, Canada, & Sutton, 2011)

Arnold, Vicky Benford, Tanya S. Canada, Joseph Sutton, Steve G.	2011	Journal Article	International Journal of Accounting Information Systems	Impact of ERM on VC	1	0	75.50%
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Strategic Risk Management

Examining organizations' pre-SOX ERM processes, ERM supporting technologies, and organizational flexibility in order to better understand the antecedents to the difficulty encountered in meeting SOX 404 requirements	Strategic ERM is defined as a framework for risk management that entails the following: (1) identifying events and circumstances relevant to an organization's achievement of its goals and objectives, (2) assessing these events and circumstances in terms of likelihood and magnitude of impact, (3) determining a strategy for responding to the identified threat or opportunity, and (4) monitoring the subsequent evolution and impact of the events	ERM strategic benefits measure: Organization performs a thorough enterprise-wide risk assessment at least once a year = ERM1; Strength of internal control system enhances organization's ability to identify events that may affect the achievement of objectives = ERM2; Organization regularly evaluates the effectiveness of internal controls to mitigate identified risks = ERM3; Management has effective processes to respond to identified risks = ERM4; RM procedures provide the necessary information top management needs to monitor changes that could impact our organization's well-being = ERM5; (Measures are designed to reflect the overall strategic ERM development; strength of ERM processes relates to how well an organization's ERM processes achieve the goals of ERM) (adapted from Vicky Arnold, Benford, Hampton, & Sutton, 2009)	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = Questionnaire (close-ended, Likert scale); Method of data analysis = statistical (descriptive statistics, partial least squares, formative construct, t-statistics)	113 Chief Audit Executives (CAEs) members of the Institute of Internal Auditors Research Foundation (IIARF) in the U.S.; 94% employed at publicly traded companies; industries: financial services / real estate (17%), technology (11%), insurance (10%); data for variables strategic ERM (5-point Scale) drawn from Questionnaire
Qualitative benefits (item measures, questions to CAE): increasing strength of control environment, increasing IT compatibility, enhancing organizational flexibility, decreasing SOX 404 implementation difficulty	No specific linkage between ERM theories and VC found	Direct relationship between the strength of ERM processes and the organization's control environment; positive association between the strength of ERM and IT compatibility; organizations with strong strategic ERM processes prior to SOX 404 mandates faced fewer obstacles in implementing the processes necessary to meet internal control requirements; organizations with weak ERM processes incurred the greatest difficulty in implementing effective compliance processes	Views of CAE on SOX 404 compliance experience may not be reflective of other chief executives in the organization; limited set of organizational structures and processes; only organizations studied that have at least one in-house internal auditor (responses on chief audit executives narrowed)	

Enterprise Risk Management as a Strategic Governance Mechanism in B2B-Enabled Transnational Supply Chains (Vicky Arnold, Benford, Hampton, & Sutton, 2012)

Arnold, Vicky Benford, Tanya S. Hampton, Clark Sutton, Steve G.	2012	Journal Article	Journal of Information Systems	Connex maturity level of ERM and VC	0	0	70.00%
Examination of the influence of strategic enterprise risk management (ERM) processes on improving supply chain capability while mitigating risks	ERM is a strategic mgmt. approach to integrating and coordinating RM efforts across an organization through comprehensive processes for identifying and addressing risks. An important aspect of strategic ERM is the focus on identifying both threats (risks with negative effects) and opportunities (risks with positive effects). ERM - Integrated Framework: "A process that aligns organizational risk appetite and strategy, enhances risk response decisions, reduces operational surprises and associated costs, identifies and manages integrated responses to cross-enterprise risks, proactively identifies and realizes opportunities, and improves capital allocation" (COSO, 2004).		ERM strategic benefits measure: measures are reflective of activities typically associated with strategically and holistically balancing risk; Company performs a thorough enterprise-wide risk assessment at least once a year = ERM1; Company is able to identify events that may affect the achievement of our objectives = ERM2; RM procedures provide the necessary information top management needs to monitor changes that could impact our company’s well-being = ERM3; One focus of ERM is the strength of internal control system for risk identification = ERM4 (adapted from Arnold et al, 2009)	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = Questionnaire; Method of data analysis = statistical (descriptive statistics, covariance-based structural equation modelling, Chi-square test)	207 participants employed at North American organizations in 2011 and engaged in transnational supply chain relationships; subsample of 179 responses from 28 countries from CLOBE study used to examine the cross-cultural implications		
Qualitative benefits (measured by five-point Likert-type scale in Questionnaire): decrease in B2B e-commerce risk; decrease in global business risk; increase in absorptive capacity (ability to recognize the value of new external information, absorb it, and apply it for commercial ends)	No specific linkage between ERM theories and VC found		Strategic ERM leads to stronger governance over transnational supply chain partners; stronger ERM promotes higher levels of partner absorptive capacity, lower B2B risk, and lower associated global business risk; stronger ERM is associated with partners being from countries with cultural traits conducive to strong supply chain performance	Study may be limited in its ability to project on the role of ERM in the partner selection and integration processes			

The Relationship between Enterprise Risk Management (ERM) and Firm Value: Evidence from Malaysian Public Listed Companies (Tahir & Razali, 2011)

Tahir, Izah Mohd Razali, Ahmad Rizal	2011	Journal Article	International Journal of Economics and Management Sciences	Impact of ERM on VC	0	0	70.00%
<i>Enterprise-Wide Risk Management (EWRM), Holistic Risk Management (HRM), Corporate Risk Management (CRM), Business Risk Management (BRM), Integrated Risk Management (IRM) and Strategic Risk Management (SRM)</i>							
Estimating the relation between ERM and firm value in the Malaysian public listed companies	ERM - Integrated framework: "A process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of the entity's objectives" (COSO, 2004)		Keyword search: Enterprise Risk Management, dummy variable 1 = practice ERM and 0 otherwise	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data (OSIRIS database); Method of data analysis = statistical (descriptive statistics, OLS regression analysis)	528 public listed companies from Malaysia in 2007 (Industrial Product 26%, Trading/Services 24%, Properties 15%, Consumer Products 15%) data obtained from OSIRIS database		
Tobin's Q as the market value of equity plus the book value of liabilities divided by the book value of assets	No specific linkage between ERM theories and VC found		Descriptive statistics: 29.7% are ERM-user; ERM has no impact on firm value; Regression results: ERM is positive but not significant with firm value;		No limitation stated		

The Effects of Enterprise Risk Management on Firm Performance (Pagach & Warr, 2010)

Pagach, Donald Warr, Richard	2010	Electronic Article	papers.ssrn.com	Impact of ERM on VC	0	13	66.50%
Study of the effect of ERM implementation on firms' long-term performance by focusing on how risk, financial, asset	A holistic view of RM and attempts to reduce the probability of large negative earnings and cash flows by coordinating and controlling offsetting risks across the enterprise. ERM-Integrated Framework: "A process, affected by		Hiring announcements of enterprise-level or chief risk officers (CRO) as a signal for ERM adoption; proxies used were "announced", "named", or "appointed", in conjunction with position descriptions such as "chief risk officer" or "director of risk management";	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary	106 publicly traded companies with announcements of senior risk officer appointments from 1992-2004; financial firms 56, utilities		

THE NEXUS OF ENTERPRISE RISK MANAGEMENT AND VALUE CREATION

and market characteristics change around the time of ERM adoption	<i>an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives. ERM help(ing) an entity get to where it wants to go and avoid pitfalls and surprises along the way" (COSO, 2004)</i>	initial sample search included "title" terms like Chief, Director, Vice President, President, Head, Managing Director, Manager, General Manager	data; Method of data analysis = statistical (multivariate: measurement of changes in key variables in the years after relative to the years before a CRO appointment)	15; data collected from Compustat/CRSP (SIC Code mainly 4900s/6000s); and a matched control sample
Earnings volatility (standard deviation of the error term from a regression of the firm's quarterly earnings on the prior quarter's earnings) and stock price volatility (standard deviation of the firm's daily returns over the year prior to the hiring of the CRO); leverage (total liabilities to assets); accounting return (return on equity= net income/book equity); financial slack (proportion of the firm's assets that are cash or cash equivalents); opacity (ratio of intangibles to total assets); growth (market-to-book (MB) ratio and research and development expense)	No specific linkage between ERM theories and VC found	Significant decline in the standard deviation of stock returns for the CRO firms; no significant change in the earnings volatility, no leverage increase, no size increase due to ERM adoption; results fail to find support for the proposition that ERM is value creating		Data may be too noisy or tests too weak to pick up the changes; ERM could take a longer period of time to implement and pick up benefits from; ERM might not have any significant effect on firm performance, or no effect that can be measured from a financial statement users perspective

The Value of Investing in Enterprise Risk Management (Grace et al., 2010)

Grace, Martin F. Leverty, Tyler J. Phillips, Richard D. Shimpi, Prakash	2010	Electronic Article	papers.ssrn.com	Impact of ERM on VC	0	1	65.50%
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Examination of the impact of ERM on firm value by investigating its effect on firm cost and revenue efficiency while controlling for firm specific factors; focus of analysis directly on the cash flow implications of adopting ERM	ERM is a holistic approach to risk management in which many risks are examined jointly. It is an enterprise level assessment, quantification, financing, and managing of risk. With ERM a firm assesses the interaction of a risk with the firm's portfolio of other important risks.	Tillinghast Towers Perrin survey: Detailed information on a number of ERM initiatives from a survey conducted by Tillinghast Towers Perrin on their worldwide insurance clients; variables to evaluate ERM program: economic capital model (ECM); market value based risk metric; CRO or significant risk management entity; entity responsible for risk management reports to the board, the CFO, the CEO, or a committee; risk management influences executive compensation; risk reflection in decision making process	Research design = quantitative; Paradigm = Post-positivism ; Methodology = survey research; Method of data collection = secondary data; Method of data analysis = statistical (multivariate regression model, efficiency as the vector of firm characteristic variables and vector of variables of ERM activities)	National Association of Insurance Commissioner's (NAIC's) annual regulatory statement database; 532 observations (U.S. 306; non U.S. 226); data from the Bureau of Labor Statistics, the Federal Reserve Board, and A.M. Best; life-insurers & property insurers for the year 2004 and 2006; Tillinghast Towers Perrin ERM survey for 2004 and 2006 for ERM practice identification
Cost and revenue efficiency (ROA) using frontier efficiency measures (standard linear programming technique, data envelopment analysis (DEA), to construct the "best practice" frontier for each firm and measure the firm's performance relative to this frontier; frontier efficiency analysis in R (FEAR) to estimate and bootstrap efficiency) for firm performance measurement; value-added approach to identify the important outputs of life and property-liability insurers	Life insurers with the use of an economic capital models, the use of a dedicated risk committee and primary reporting relationship to officials in the C-Suite of the insurer (either the CEO or the CFO) and the reflection of risks in their business decisions increases efficiency and return on assets; insurers with a dedicated entity responsible for firm-wide risk management experience a higher level of cost efficiency and returns on assets	Significant increases in both cost and revenue efficiency; life insurers benefit from the use of economic capital models and produce significant increases in returns on assets; insurer with entity responsible for firm-wide risk management (such as a CRO) also experiences a higher level of cost efficiency and returns on assets; use of risk committee and a primary reporting relationship to the officials in the C-Suite of the insurer (either the CEO or the CFO) is significantly related to increases in efficiency and return on assets; insurer's confidence that risk is reflected in business decisions is also significantly related to increases in efficiency and returns on assets	No limitation stated	

Enterprise Risk Management on the Internal Audit Function (Beasley, Clune, & Hermanson, 2006)

Beasley, Mark S.	2006	Report	North Carolina State University, Enterprise Risk Management Initi-	Impact of ERM on VC	0	3	63.50%
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THE NEXUS OF ENTERPRISE RISK MANAGEMENT AND VALUE CREATION

Clune, Richard Herman- son, Dana R.			ative				
Examining the overall impact of ERM adoption on the internal audit function's activities (i.e., in which situations does ERM alter internal audit's focus and workload to the greatest extent?)	ERM - Integrated Framework: " <i>A process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives</i> " (COSO, 2004)		COSO ERM scale: Definition and elements of COSO's ERM framework for the survey instrument; ERM Complete = if a complete ERM framework is in place; ERM Partial = if a partial ERM framework is in place (i.e., some, but not all risk areas addressed); ERM Plan = if the entity is currently planning to implement an ERM framework; ERM No Dec. = if the entity is currently investigating the concept of ERM, but has made no decision yet (no plans to implement ERM is in the intercept)	Research design = quantitative; Paradigm= Post-positivism; Methodology = survey research; Method of data collection = Questionnaire (close-ended questions); Method of data analysis = statistical (descriptive statistics, OLS regression model, sensitivity analysis)			122 organizations of the IIA's Global Audit Information Network (GAIN) in 2004, respondents were chief audit executives (79 in the U.S., 13 in Canada, eight each in Great Britain and Australia, and 14 in other countries; 10% banks, 12% educational institutions)
Qualitative impact on Internal Audit: via Questionnaire to evaluate impact on scale from 1 = not at all to 5 = greatly	No specific linkage between ERM theories and VC found		Descriptive statistics: 14 organizations have a complete ERM framework in place, 55 reported a partial ERM framework; 18 planning to implement ERM, 17 are investigating ERM but have not made a decision yet, 18 have no plans to implement; Regression results: ERM has greatest impact on internal audit's activities when (a) the organization's ERM process is more completely in place, (b) the CFO and audit committee have called for greater internal audit activity related to ERM, (c) the chief audit executive's (CAE) tenure is longer, (d) the organization is in the banking industry or is an educational institution, and (e) the internal audit function has provided more ERM leadership; no evidence of an association between organization's size and ERM impact on IA				Rely on accuracy of individuals responses to online survey; response rate to survey is lower than typical for surveys of IA; there may be important organizational characteristics of ERM involvement that are not reflected in the study

Enterprise Risk Management Program Quality: Determinants, Value Relevance, and the Financial Crisis (Baxter et al., 2011)

Baxter, Ryan Bedard, Jean C. Hoitash, Rani Yezege, Ari	2011	Electronic Article	papers.ssrn.com	Connex maturity level of ERM and VC	0	0	62.50%
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Investigation of factors associated with high quality Enterprise Risk Management (ERM) programs, and whether ERM quality enhances performance and signals credibility to the financial markets	ERM Integrated framework: <i>"A process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of the entity's objectives"</i> (COSO, 2004)	Standard & Poor's RM Quality Scale: Advanced: six categories, 1 = weak (no consistent control of major risks; limited ability to fully identify, measure, or manage major risk exposures), 2 = weak-adequate, 3 = adequate, 4 = strong-adequate (adequate = fully functioning risk control systems for major risks; RM is silo-based; lack of clear vision of overall risk profile and overall risk tolerance; risk limits for various risks are set independently, and systems for each risk element functions separately; lack of robust process for identifying and preparing for emerging risks; no process to optimize risk-adjusted return); 5 = strong (vision of overall risk profile, an overall risk tolerance, a process for developing risk limits and goal of optimizing risk-adjusted returns; robust processes to identify and prepare for emerging risks), 6 = excellent (share all the criteria for strong programs but more advanced in development, implementation, and execution effectiveness; process developed more fully) (Standard&Poor's, 2006)	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data (database); Method of data analysis = statistical (descriptive statistics, OLS regression, logistic regression, sensitivity analysis)	165 firm-year observations in the banking and insurance industries from the U.S. with coverage in the S&P Ratings Direct database in 2006-2008; data for independent and performance variables drawn from Compustat, SEC filings, CRSP, S&P credit rating, Audit Analytics, IRRC and Lexis Nexis
Financial performance measured by ROA (ratio of income before extraordinary items divided by total assets); value creation measured by Tobin's Q (market value of equity plus the book value of liabilities divided by the book value of assets); stock market reaction (average abnormal return around S&P rating announcement)	no specific linkage between ERM theories and VC found	25% strong or excellent ratings (firm's ERM quality sample: 6 weak, 11 weak-adequate, 84 adequate, 22 strong-adequate, 35 strong, 7 excellent); ERM adoption: more complex (larger, more diversified) entities have higher quality programs; companies with higher volatility and/or risk of financial distress may demand better programs; higher-risk companies have lower quality ERM; higher quality of ERM among companies with better corporate governance; i.e., audit committees charged with direct oversight of risk, less audit-related risk (i.e., stable auditor relationships and effective internal controls), risk officers/committees, and boards with longer tenure); Impact ERM: ERM quality is positively associated with firm performance; positive and significant association between ERM and Tobin's Q; when ERM programs are initially rated by S&P, average market reaction is higher for strong and excellent ERM rated firms than for firms with lower ratings; results imply market anticipation of better future performance by high-quality ERM companies; intensity of investors' average reactions to earnings surprises increases for companies with higher quality ERM; Financial Crisis: no association of ERM quality with abnormal returns in the sub-period preceding the crisis; strong association of ERM quality and returns in the initial recovery period	Implicitly assume that components of S&P ERM ratings validly represent aspects of ERM quality, and that program effectiveness increases in ERM rating score; If credit ratings were biased upward during sample period, may also have applied to ERM quality ratings; limitation of analysis to financial services companies; impact of ERM on the equity markets is less clear	

The impact of hedge accounting rules on enterprise risk management adoption practices by multinationals (Klumpes et al., 2011)

Klumpes, Paul J. M. Wang, Pengguo Tang, Liyan Abhyankar, Abhay	2011	Electronic Article	papers.ssrn.com	Impact of ERM on VC	0	0	62.50%
Testing the benefits of ERM implementation by controlling for variables like firm specific risk, hedge accounting policies and GAAP quality	Not defined		Keyword search: "Chief Risk Officer", "Enterprise Risk Management", "Enterprise Risk Officer", "Strategic Risk Management", "Integrated Risk Management", "Holistic Risk Management" and "Consolidated Risk Management"	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data (database); Method of data analysis = statistical (descriptive statistics; multivariate logistics, OLS model)	60 European and 121 US non-financial publicly listed firms in the S&P 500 and Euro top 300 during 2005-2009; search for ERM keywords in annual reports; 59 firms adopted ERM between 2005 and 2009; financial data from COMPUSTAT, stock price data from CRSP, derivative reporting data from annual report		
Stock return volatility as log of the annualized standard deviation of monthly stock returns (measure for a firm's total risk); risk to reward ratio as operating profits per unit of risk (ROA/return volatility)	No specific linkage between ERM theories and VC found		Descriptive statistics: ERM firms are less volatile, significantly larger, more diversified and levered; Multivariate results: larger firms are more likely to adopt ERM; firms with less onerous net pension obligations are more likely to adopt ERM; ERM adoption is positively related to market risk but negatively related to idiosyncratic; significantly negative relation between GAAP quality and firm volatility; reduction in stock return volatility disappear over time and risk to reward benefits reduce over time		Results are conditioned on voluntary disclosure of notional values		

Enterprise Risk Management: Re-Conceptualizing the role of Risk and Trust on Information Sharing in Transnational Alliances (Vicky Arnold et al., 2009)

Arnold, Vicky Benford, Tanya S. Hampton, Clark Sutton, Steve G.	2009	Electronic Article	papers.ssrn.com	Connex maturity level of ERM and VC	0	0	62.50%
Examining the influence of ERM on risk and trust associated with transnational alliances and the resulting impact on inter-organizational information sharing	A process that requires senior management direction, extends across the whole organization, and signifies a new organizational consciousness of ‘risk appetite’ and assurance.		ERM strategic benefits measure: Company performs a thorough enterprise-wide risk assessment at least once a year = ERM1; Company is able to identity events that may affect the achievement of objectives = ERM2; Company regularly evaluates the effectiveness of internal controls for mitigating identified risks, management has effective processes to respond to identified risks = ERM3; RM procedures provide the necessary information top management needs to monitor changes that could impact company’s well-being = ERM4; Focus of ERM is the strength of internal control system for risk identification = ERM5; for each ERM stage five point Likert scale where 1 represented the strongest positive response, 5 represented the strongest negative response, and 6 represented “no basis for answering”	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = Questionnaire (close-ended, Likert scale); Method of data analysis = statistical (descriptive statistics, structural equation modelling (SEM), sensitivity testing)	200 North American managers monitoring relationships with transnational supply chain partners (managers are familiar or very familiar with relationships) and supply chain partners located in an array of different countries and geographical locations; manufacturing 16%, wholesale/retail 15%; 2 sub samples: 117 respondents high ERM firms; 83 low ERM firms		
Qualitative benefits (item measures): B2B ecommerce risk: five aspect strategic nature, understanding of benefits, reengineering of business processes, management of data processes, and obligation fulfilment; trust: general trust in a supply chain partner in addition to trust issues distinct to B2B ecommerce based alliances; information sharing: breadth, quality, privileged nature and coordination of the information exchanged	No specific linkage between ERM theories and VC found		Positive association between increasing levels of organizational ERM and increasing trust in a supply chain partner; increases in strength of an organization’s ERM are negatively associated with alliance partner’s business risk (increased ERM leads to decreased risk); a positive relationship between ERM and information sharing; sensitivity testing: sample into two groups; for high-level ERM firms, all relationships center around business risk with risk levels driving trust and information sharing; for remaining sub-sample, all relationships center around trust with trust driving perceived risk and the level of information sharing	Study was focused on North American managers and there might be differences to other regions; survey data captures perception data as opposed to observable or archival data			

Enterprise Risk Management in Financial Crisis (Seik, Yu, & Li, 2011)

Seik, Heng Yik Yu, Jifeng Li, Jared	2011	Journal Article	The IUP Journal of Risk & Insurance	Connex maturity level of ERM and VC	0	0	62.00%
Examining whether ERM helps property and casualty insurers withstand financial crisis	ERM overview - Casualty Actuarial Society: <i>"The discipline by which an organization in any industry assesses, controls, exploits, finances and monitors risks from all sources for the purpose of increasing the organization's short- and long-term value to its stakeholders"</i> (CAS, 2003). ERM is an integrated approach in dealing with risk exposure in a business. Since ERM is an overview of the company's risk portfolio, it focuses not just on pure risks but also on financial risk, operational risk, reputation risk, and any other type of company risks. ERM considers risks as interrelated and the process should be incorporated in business strategies and decision-making processes.		Two variables: ERM Keywords: "CRO", "Chief Actuary Officer", "Vice President of Enterprise Risk Management", "Risk Management Committee" AND Standard & Poor's RM Quality Scale four categories, ERM 'excellent' = advanced capabilities to identify, measure, manage all risk exposures within tolerances; advanced implementation, development and execution of ERM parameters; consistently optimizes risk adjusted returns; ERM 'strong' = clear vision of risk tolerance and overall risk profile; risk control exceeds adequate for major risks; robust processes to identify and prepare for emerging risks; incorporates RM and decision making to optimize risk adjusted returns; ERM 'adequate' = fully functioning control systems in place for major risks; lack of robust process for identifying and preparing for emerging risks; performing good 'silo'-based RM; not fully developed process to optimize risk adjusted returns; ERM 'weak' = incomplete control process for major risks; inconsistent or limited capabilities to identify, measure or manage major risk exposures (Standard&Poor's, 2006)	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data (database); Method of data analysis = statistical	12 publicly traded property and casualty insurers in the US from New York Stock Exchange (NYSE) or NASDAQ during 2006 to 2008; 5 firms in 'ERM group' (three companies with excellent or good ERM and two firms with weak ERM programs according to S & P's rating (2008)) and 7 companies in 'non-ERM group'; search of CRO appointment in companies' annual reports, companies' websites, news or article in Lexis Nexis; stock return data from finance.yahoo.com from 2006 to 2009		
Stock return volatility (standard deviation); loss ratios (ratio of incurred losses to earned premiums and is used to measure the percentage of loss payments made by the company from each dollar of earned premiums in a year), combined ratios after dividends (gains from overall underwriting activity by including the total underwriting expenses	No specific linkage between ERM theories and VC found		Companies with 'excellent' or 'strong' ERM programs have a relatively low stock volatility, lower than non-ERM peers; insurers with better ERM have lower loss ratios than those of weak ERM insurers; insurers with strong ERM have higher combined ratios than those of the industry average; in terms of overall operating ratios quality ERM insurers outperform the weak ERM insurers and the industry average; results indicate that ERM programs, if not properly implemented will jeopardize the financial stability of the firm		No limitation stated		

ratio into loss ratio) and overall operating ratios (pre-tax operating profitability which includes its return on investment and underwriting revenues and expenses)			
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The Impact of Enterprise Risk Management on the Marginal Cost of Reducing Risk: Evidence from the Insurance Industry (Eckles, Hoyt, & Miller, 2011)

Eckles, David L. Hoyt, Robert E. Miller, Steve M.	2011	Electronic Article	villanova.edu	Impact of ERM on VC	0	3	61.50%
Testing the impact of ERM adoption on firms' risk taking behaviour by testing the hypothesis that practicing ERM reduces firms' cost of reducing firm risk; lowers the marginal cost (MC) of reducing risk, which creates incentives for profit-maximizing firms to reduce total risk while increasing firm value	ERM is a process that identifies, assesses and manages individual risks (e.g. currency risk, interest rate risk, reputational risk, legal risk, etc.) within a coordinated and strategic framework.		Keyword search: "Chief Risk Officer", "Enterprise Risk Management", "Enterprise Risk Officer", "Strategic Risk Management", "Integrated Risk Management", "Holistic Risk Management", "Consolidated Risk Management"	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data (database); Method of data analysis = statistical (descriptive statistics, bivariate, regression analysis)	69 publicly-traded insurance companies in the US drawn from CRSP/COMPUSTAT database from 1990 to 2008 (i.e. firms with Standard Industry Classification Code between 6311 and 6399) and identified as ERM user by a search in Factiva, LexisNexis, Thomson and Edgar; financial data from COMPUSTAT, stock price data from CRSP and institutional ownership from Compact Disclosure		
Risk reduction & Profit increase; reduction in firm's total risk measured by the log of the annualized standard deviation of daily stock returns (stock return volatility as proxy for firm risk, because it is a well-establish measure for a firm's total risk); profit increase is measured by ratio of Re-	ERM-adopting firms combine their individual risks in risk-portfolio leading to better recognize natural hedges, prioritize hedging activities towards the risks that contribute most to the		Firms adopting ERM experience a reduction in stock return volatility; due to costs and complexity of ERM implementation, it is also found that the reduction in return volatility for ERM-adopting firms become stronger over time; operating profits per unit of risk (ROA/return volatility) increase post ERM adoption		No limitation stated		

THE NEXUS OF ENTERPRISE RISK MANAGEMENT AND VALUE CREATION

turn on Asset (ROA) to firm risk post-ERM adoption (ratio of ROA over annualized standard deviation of stock returns) (alternative definitions of profits used, including return on book value of common equity and return on market value of common equity)	total risk of the firm, and optimize the evaluation and selection of available hedging instruments; these advantages allow ERM-adopting firms to produce greater risk reduction per dollar spent;		
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Enterprise Risk Management: Strategic Antecedents, Risk Integration and Performance (Lin et al., 2011)

Lin, Yijia Wen, Ming-Ming Yu, Jifeng	2011	Electronic Article	papers.ssrn.com	Connex maturity level of ERM and VC	0	0	58.50%
Investigation whether the heterogeneity in Individual Risk Management practices (IRM: hedging, insurance etc) across firms accounts for their different propensities toward adopting ERM (Considering that ERM integrates IRMs) Analysing the patterns of IRM adjustments subsequent to ERM adoption; Examination of influence of ERM on firm performance in the context of IRMs	Through a holistic approach, ERM identifies and measures diverse risk factors and coordinates risk management activities across all operating units of an organization; ERM - integrated framework: "A process ... applied in strategy setting and across the enterprise" (COSO, 2004)		Two variables: ERM Keywords: "Enterprise Risk Management", "Chief Risk Officer", "Risk Committee", "Strategic Risk Management", "Consolidated Risk Management", "Holistic Risk Management", and "Integrated Risk Management" (as dummy variable) AND Standard and Poor's RM Quality Scale ERM1 = Weak; ERM2 = Adequate; ERM3 = Strong; ERM4 = Excellent (Standard&Poor's, 2006)	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data (database); Method of data analysis = statistical (descriptive statistics; probit regression model; Simultaneous Equations Model; Treatment-Effect Model; Sensitivity tests)	507 observations for 85 publicly traded property and casualty (PC; SIC code 6331) insurers in the U.S. market during 2002 - 2007; Accounting and derivatives related data obtained from National Association of Insurance Commissioners (NAIC) annual statements; market-based measures constructed by using data from Compustat; Credit information from A. M. Best's Key Rating Guide; search in SEC filings, LexisNexis, company websites and Google for ERM evidence		

Benefits: reinsurance costs (Ratio of reinsurance ceded to sum of direct business written and reinsurance assumed), asset portfolio volatility (Annualized volatility of assets estimated from seven asset return series from 1991Q1 to 2007Q4), cost of financial risk measured by derivative usage (Notional amount of all derivative positions for hedging purpose held at year end, normalized by total assets);Tobin's Q (market value of equity plus the book value of liabilities divided by the book value of assets) & return on asset (ROA) (Net income divided by total assets) & Underwriting ROA (underwriting income divided by total assets)	No specific linkage between ERM theories and VC found	Descriptive statistics: 18,5% use ERM; derivative usage by ERM insurers higher than non-ERM insurers; ERM insurers more diversified in terms of lines of business and underwriting regions; ERM insurers have higher Tobin's Q, ROA and Underwriting ROA than non-ERM insurers; ERM insurers are larger and have better credit rating than non-ERM insurers; Probit model: insurers using more reinsurance and with larger degree of geographic diversification are more likely to adopt ERM; product diversification, use of derivatives or asset allocation shows no significant effects on ERM initiation; insurers with high reinsurance sustainability index are less likely to pursue ERM; larger firms and with better credit rating are more likely to engage in ERM; financial stress from the exposures to catastrophe risks is more important than leverage; Equation model: ERM reduces cost of reinsurance from less reinsurance purchase; ERM reduces cost of financial risks via more derivative usage; ERM leads to lower asset volatility; Treatment effect model: ERM lowers Tobin's Q, ROA, Underwriting ROA; Sensitivity test with S&P Rating: weak ERM insurers have lower ROA and Underwriting ROA than non-ERM firms in 2007; a poorly implemented ERM program is detrimental to the firm	No limitation stated
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The Relationship between Enterprise Risk Management and External Audit Fees: Are they Complements or Substitutes? (Desender & Lafuente, 2010)

Desender, Kurt Lafuente, Esteban	2010	Electronic Article	papers.ssrn.com	Connex maturity level of ERM and VC	0	0	58.50%
Exploring how the adoption of enterprise risk management (ERM) practices and the presence of a CRO influence external audit fees in large pharmaceutical firms	ERM - Integrated framework: <i>"A process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of the entity's objectives"</i> (COSO, 2004).		Two variables: ERM Keywords: "CRO" (as dummy variable) AND COSO ERM Index: ERM framework (2004) as an aggregate measure of ERM, (list of 108 items related to ERM, scoring zero (absence) or one (presence) composited under the eight dimensions of COSO's ERM framework (2004): 1) internal environment, 2) objective setting, 3) event identification, 4) risk assessment, 5) risk response, 6) control activities, 7) information and communication, and 8) monitoring); variable used = weighted average of eight dimensions	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data (annual reports, 10-K's, proxy statement, company website); Method of data analysis = statistical (descriptive statistics, OLS regression model)	97 U.S. based pharmaceutical firms (SIC code: 2834) randomly chosen and listed on Amex, NYSE or NASDAQ; data was collected for 2004 from the company's annual reports; information about ERM practices was obtained from public sources (10-K's, proxy statements, annual reports, firms website)		

THE NEXUS OF ENTERPRISE RISK MANAGEMENT AND VALUE CREATION

Natural log of audit fees as dependent variable = total fee paid to all auditors for both audit and non-audit services	No specific linkage between ERM theories and VC found	Descriptive statistics: 39% of firms report the presence of a Chief Risk Manager in 2004; firms of sample have adopted on average 33% of the ERM practices considered in index; Regression results: larger firms pay higher external audit fees; the mere presence of a CRO does not exert a significant impact on external audit fees; taking into account the ERM index: firms that heavily rely on ERM report significantly lower levels of external auditing fees (implies a reduction in hours required by external auditors); board independence and ownership concentration are not significantly related to audit fees; external audit fees are significantly lower in firms where CEO also serves as Chairman; the size of the audit committee is positively related to external audit fees	Results are limited due to fact that publicly available data may not reflect true state of ERM implementation (coped by using alternative proxy for ERM); study focuses on a single industry, may not be generalized for other industries; maybe other organizational characteristics of ERM deployments not considered
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The Effect of Enterprise Risk Management Implementation on the Value of Companies Listed in the Nairobi Stock Exchange (Waweru & Kisaka, 2011)

Waweru, Nelson Kisaka, Eric Simiyu	2011	Electronic Article	papers.ssrn.com	Connex maturity level of ERM and VC	0	0	54.50%
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"Integrated Risk Management (IRM)", "Enterprise wide risk management (EWRM)"

Assessment of the level of implementation of ERM in companies listed in the Nairobi Stock Exchange. Testing the significance of factors affecting this level of ERM implementation and to investigate whether the level of ERM implementation has a positive effect to the value of companies.	ERM - Integrated framework: <i>"A process, effected by an entity's board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of the entity's objectives"</i> (COSO, 2004)	COSO ERM scale: Definition COSO's ERM framework for survey instrument; ERM LEVEL 6 = ERM framework is well formulated across business and fully implemented; ERM LEVEL 5 = ERM framework is well formulated across business, with implementation in progress and a clear timetable for completing implementation; ERM LEVEL 4 = ERM framework is well formulated across business, with a clear timetable for implementation but implementation has not started; ERM LEVEL 3 = ERM framework is a partially developed concept and there is no clear timetable for implementation; ERM LEVEL 2 = No ERM framework is in place but there is a plan to introduce one in the short-term; ERM LEVEL 1 = No ERM framework and no plans to introduce one	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = questionnaire (for ERM level) & secondary data (financial statements for factors influencing ERM level); Method of data analysis = statistical (descriptive statistics; multivariate regression analysis; ordinary least squares regression model; Variance Inflation Factors)	22 Chief Internal Auditors as the respondents of companies listed on Nairobi Stock Exchange (Industry: Commercial & Service (6), Industrial & Allied (4), Finance & Investment (12)) ; market value data used for Tobin's Q; data collected from financial reports of companies and NSE website (Dec 2009 financial statements for companies whose year end is in Dec and year 2010 financial statements for companies whose year ends
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				fall between Jan and Jun)
Tobin's Q as the market value of equity plus the book value of liabilities divided by the book value of assets	Companies that implement ERM according to COSO's Integrated Framework in the NSE are valued at 16% higher than those that have not implemented ERM	Significant relationship between the value of the firm and the Level of ERM implementation, the company's size and the profitability of the firm; companies engaged in ERM are valued at 16% higher than other companies; presence of CRO/Risk champion positively associated with the extent of ERM deployment; organisation's size, institution's auditors, industry of operation, board independence, regulatory pressure and growth have no significant influence on ERM level;	Difficulties to measure the level of ERM implementation with limited subjectivity of questionnaire responses; only 49% of the targeted population responded to questionnaire and most of the respondents were from the financial services segment thus there is a probability of industry bias in the research findings; email questionnaires had a limitation in terms of response rate; small sample size also limited the extent of statistical analysis	

The Relationship between enterprise risk management and creating value in Iranian insurance companies (Mazloomi & Izadpanahi, 2010)

Mazloomi, Nader Izadpanahi, Sareh	2010	Conference Paper	World Risk and Insurance Economic Congress, Singapore	Impact of ERM on VC	0	0	54.50%
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"Enterprise Risk Management", "Integrated Risk Management", "Corporate Risk Management"

Relationship between ERM techniques in the field of "financial & operational risks" and "creating value" in insurance companies is studied	ERM overview - Casualty Actuarial Society: <i>"An operational discipline that manages risks from all sources (hazard, financial, operational and strategic risk) in order to increase short and long-term value of organization" (CAS, 2003).</i> ERM Framework: <i>"A process which is applied in strategy setting and designed to identify potential events to provide reasonable assurance regarding the achievement of the objectives" (COSO, 2004).</i> Integrated - ERM must span all	ERM components: Existence of Risk Management philosophy, Risk identification & analysis (Risks identification, qualitative & quantitative assessments, risks classification, risks prioritization), Extent of Risk Financing and Controlling techniques (Financing: Investment and Reserve management, Capital allocation; Controlling: Portfolio management, Asset-liability management, risk transfer & reinsurance, rules & limitations), Availability of ERM implementation requirements (Existence of CRO, risk reporting to senior man-	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = Questionnaire & secondary data (financial statement); Method of data analysis = statistical (Friedman test,	21 companies from insurance industry (state-owned & privately owned); data source are financial statements from 2008
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THE NEXUS OF ENTERPRISE RISK MANAGEMENT AND VALUE CREATION

	lines of business, Comprehensive - ERM must include all types of risks, Strategic - ERM must be aligned with overall business strategy.	agement, RM committees, systems & data management)	regression analysis)	
Economic Value Added (EVA) = net operating profit minus an appropriate charge for the opportunity cost of all capital invested in an enterprise (Net Operating Profit after Tax (NOPAT) and net asset; Weighted Average Cost of Capital as average return expected from capital structure of the firm)	No specific linkage between ERM theories and VC found	Findings did not support a systemic use of ERM as a strategy by the insurance companies; and it was not practiced as a whole concept; the result of regression analysis carried out between ERM (independent variable) and EVA (dependent variable) showed that in the field of financial and operational risk no significant relationship was found	No limitation stated	

The Rise and Evolution of the Chief Risk Officer: Enterprise Risk Management at Hydro One (Aabo et al., 2005)

Aabo, Tom Fraser, John R. S. Simkins, Betty J.	2005	Journal Article	Journal of Applied Corporate Finance	Connex maturity level of ERM and VC	2	24	54.50%
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"integrated", "strategic", "enterprise-wide"

Description and analysis of a best practice example for a successful implementation of ERM and the benefits provided by Hydro One, Inc	Foreign exchange risk, operational risk, credit risk, and commodity risks function all as parts of an integrated, strategic, and enterprise-wide system. Risk Management is coordinated with senior-level oversight, and employees at all levels of the organization are encouraged to view risk management as an integral and on-going part of their jobs.	Not defined	Research design = qualitative; Paradigm = Constructivism; Methodology = case study; Method of data collection = not stated (assume: interview & secondary data - company documents); Method of data analysis = description of content	Hydro One Inc., the largest electricity delivery company in Ontario, Canada; all the shares are owned by the Ontario government by 2003; data gathered from interviews & company documents
Not defined	No specific linkage between ERM theories and VC found	Implementation: preparation of ERM Policy (governing principles/definitions) and Framework (ERM procedures); start of a pilot study (determination of top risks in workshop); preparation of risk tolerance guide-		No limitation stated

		lines (range of possible impacts on a five-point scale from Minor to Worst Case of specific risks on business objectives); identification & assessment of risks (probability of worst credible outcome & production of a 'risk map'); definition of risk tolerance by risk owner; monitoring and review; risk profile for managers twice a year (basis for resource allocation); capital allocation (based on greatest mitigation of risk per \$ spent); Benefits/outcomes: ERM enables regulatory, strategic, operational, and financial risks to be managed and aligned with strategic business objectives; positive reaction of the credit rating agencies, resulting in a reduction in the company's cost of debt; improvement of capital expenditure process; avoidance of surprises; reassurance of stakeholders that business is well managed; improvement of corporate governance; implementation of a formalized system of RM; identification of risks the company can pursue better than it peers; better understanding of employees at all levels of firm's risks	
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Enterprise Risk Management: The Case of United Grain Growers (Harrington, Niehaus, & Risko, 2002)

Harrington, Scott E. Niehaus, Greg Risko, Kenneth J.	2002	Journal Article	Journal of Applied Corporate Finance	Connex maturity level of ERM and VC	2	15	51.50%
Discussion of advantages and disadvantages of ERM, description of ERM process at UGG and outcome of the ERM process; lessons to be learned from UGG's experience with ERM	Identification and (when possible) measurement of all of its risk exposures—including operational and competitive risks—and management within a single unified framework.		Not defined	Research design = qualitative; Paradigm = Constructivism; Methodology = case study; Method of data collection = not stated (assume: interview & secondary data - company documents); Method of data analysis = description of content	United Grain Growers (UGG); provides commercial services to farmers, and markets agricultural products worldwide; public company listed on Toronto Stock Exchange; data gathered from interviews & company documents; data mainly used from 1994-1999		
Not defined		No specific linkage between ERM theories and VC found	ERM process: formation of risk management committee (CEO, CFO, risk manager, treasurer, compliance manager, corporate audit manager), identification and ranking of firms major risks, gathering data and estimating probabil-		No limitation stated		

		ity of losses, quantification of impact on performance (return on equity, EVA, EBIT); analysing relationship weather and UGG's profit; a contract based on grain shipments and integration of the grain volume "coverage" with other traditional property and liability coverage (aggregation of property losses, liability losses and grain volume losses); Benefits to UGG: coverage of a risk which was previously not hedged, more likely to have the internal funds available, increase of debt-to-equity ratio and additional tax shields without increasing the firm's cost of risk, better understanding and communication of risks	
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The influence of Enterprise Risk Management on insurers' stock market performance – an event analysis (Acharyya, 2009)

Acharyya, Madhusudan	2009	Working Paper	Society of Actuaries	Impact of ERM on VC	0	0	47.00%
Testing whether ERM influences insurers' stock market performance and the impact of critical events	ERM overview - Casualty Actuarial Society: <i>"The management of insurers' all significant risks in a holistic framework. It operationally includes the integration of financial (including market, credit and liquidity), insurance, operational, and hazard risks – termed hereinafter as enterprise risk"</i> (CAS, 2003).		Standard & Poor's RM Quality Scale: five categories, Excellent, Strong, Adequate with positive trend, Adequate and Weak (Standard&Poor's, 2006)	Research design = quantitative; Paradigm = Post positivism; Methodology = survey research; Method of data collection = secondary data; Method of data analysis = no statistical analysis; comparison and logical conclusions	16 members and 5 associate members of CRO forum (professional RM group, est. in 2004 to work on key relevant risk issues) including primary insurers and reinsurers with life and non-life businesses from several geographical locations; daily closing share prices downloaded from Thompson Analytics database or company's homepage for 2000 - 2008 (divided into catastrophic / market event timeframes: 2001 & 2002; 2004; 2005; 2007-2008 (i.e. subprime mortgage crisis)); ERM rating criteria from Rating Direct (S&P publication)		

Stock market performance = Standard deviation of stock prices	No specific linkage between ERM theories and VC found	Sub-prime crisis event affects insurers' stock price differently compared to other events: insurers' stock market performances maintain similar pattern in 2001-2002 credit crisis, 2004 US hurricanes; it was different in subprime and financial crisis 2007-08 (some insurers demonstrate superior performance and others were found severely vulnerable); it was concluded that insurers' stock market performance depend much on characteristics of industry events rather than performance of ERM OR insurers' stock market performance is an event driven phenomena without maintaining any direct link with ERM	Limitation of both quantitative and qualitative data; small sample size; inability to use statistical techniques; uneven understanding and framework of insurers' ERM program; lack of theoretical approach of perceiving ERM (financial or management approach)
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Enterprise Risk Management: Theory and Practice (Nocco & Stulz, 2006)

Nocco, Brian W. Stulz, René M.	2006	Journal Article	Journal of Applied Corporate Finance	Impact of ERM on VC	2	105	46.00%
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"Enterprise Risk Management", "Corporate Risk Management"

Examination how enterprise risk management creates value for shareholders and the practical issues that arise in the implementation of enterprise risk management	All risks viewed together within a coordinated and strategic framework	Not defined	Research design = qualitative; Methodology = literature review; Method of data collection = secondary data (literature) & development of illustrative examples; method of data analysis = description of content	Various articles & set of illustrative examples (fictive and real e.g. Nationwide Insurance);
Not defined	No specific linkage between ERM theories and VC found	ERM creates value at a “macro” or company-wide level and a “micro” or business-unit level; macro level: creates value by quantifying and managing the risk-return trade-off of the entire firm, helps the firm maintain access to the capital markets for implementing its strategy, reducing non-core risks; micro level: risk-return trade-off evaluated for all corporate decisions (decentralization), every risk is owned, risk-based capital allocation and performance evaluation; optimal level of risk: trade-off between managing risk and holding more equity to absorb costs of financial distress; ERM reduces probability of financial distress, managing risk should be less costly than holding more equity; ERM implementation: identify all risks (top-down and bottom-up), measure the risk exposure, aggregate all individual risks to a firm-wide risk profile; target accounting-based ratios as determinants of ratings; take account	No limitation stated	

THE NEXUS OF ENTERPRISE RISK MANAGEMENT AND VALUE CREATION

			of risk correlations; equity capital set should base on a VaR estimate; evaluation of ERM				
A Senior Manager’s Guide to Integrated Risk Management (Meulbroek, 2002)							
Meulbroek, Lisa K.	2002	Journal Article	Journal of Applied Corporate Finance	Impact of ERM on VC	2	48	43.00%
“Integrated Risk Management”							
Statement of managerial overview of integrated risk management, using a series of examples to illustrate the range of applicable management decisions and the benefits for the firm from its implementation	ERM involves the identification and assessment of the collective risks that affect firm value and the implementation of a firm-wide strategy to manage those risks. Integrated risk management is by its nature “strategic” rather than “tactical”.		Not defined	Research design = qualitative; Methodology = literature review; Method of data collection = secondary data (literature) & development of illustrative examples; method of data analysis = description of content	Various articles & set of illustrative examples (fictive and real)		
Not defined		No specific linkage between ERM theories and VC found	Benefits (and costs) of risk management: vary by firm; Facilitation of RM by firm’s stockholder's (corporate-level risk management is likely to be less expensive than risk management by investors); reduction of financial distress costs (by reducing the firm’s total risk); reduction of risk faced by key undiversified investors (managers with stock-and option-based compensation); reduction of tax expense (IRM smooth’s earnings to minimize taxes); reduction of monitoring costs by improving performance evaluation (for outside investor monitoring and evaluation difficult and costly, so IRM makes corporate disclosures more informative); provision of internal funds for investment (by smoothing cash flow volatility); risks within the firm partly or completely offset each other (netting significantly reduces transaction costs); reduction of unnecessary insurance (multi-risk policies)		No limitation stated		

Table 3: Substantial Content from Articles regarding ERM/VC Connex, source: Verena Kraus (2012)

Relevance of Studies

Univariate analysis with frequency distribution in the categories ‘reference type’, ‘amount secondary citation’ and ‘relevance’ will facilitate a better overview of quality and utility of coded articles to accomplish the research purpose. In the table underneath, the types of references and their respective absolute frequency (fi) and relative frequency (pi) are shown. Journal (52%) and electronic articles (36%) are clearly the most common used type in the study. The absolute and relative frequency of the journal quality according to the ABS list is additionally incorporated in the table. The journal articles used in the study are listed with a quality range from zero to three, whereby 77% of the articles are drawn from journals with a quality rating of at least one, as it can be seen from the cumulative relative frequency (ci) in the table.

Table 4: Distribution Table Reference Type

Reference Type	fi	pi	ci
Conference Paper	1	0,04	
Electronic Article	9	0.36	
Report	1	0.04	
Working Paper	1	0.04	
Journal Article	13	0.52	
Journal Quality			
0	3	0.23	1.00
1	1	0.08	0.77
2	6	0.46	0.69
3	3	0.23	0.23
Grand Total	25	1.00	

Due to numerous values for the variable ‘amount secondary citations’, the authors grouped the values into ranges and determined the frequencies for each group. The groups or classes are, in general, commensurate with a class range of 10 units, while only the last class is open to capture the outlier. For 64% of the articles, only between 0 and 10 secondary citations were detectable. The nascent study field of the ERM/VC topic might explain the experienced low amount of secondary citations.

Table 5: Distribution Table Amount Secondary Citations

Class Interval	Class Mark	fi	pi	ci
0 bis <10	5	16	0.64	0.64
10 bis <20	15	2	0.08	0.72
20 bis <30	25	2	0.08	0.80
30 bis <40	35	3	0.12	0.92
40 bis <50	45	1	0.04	0.96
>=50		1	0.04	1.00
Grand Total		25	1.00	

The total range is 105, the mean of the sample is 13.56 secondary citations and the median is 1. Based on the outlier the mean and the median vary in particular.

Table 6: Descriptive Statistics Amount Secondary Citations

N	25.00
Mean	13.56
Median	1.00
Standard Deviation	23.80
Variance	566.51
Range	105.00

Also for the frequency distribution of the variable 'relevance', groups were formed, values were assigned and group frequencies were ascertained. Every group has a range of 10%, whereby the total range of the values is 52%. The cumulative relative frequency was calculated in both ways (1) & (2), and highlights that all articles have at least achieved a relevance of 40% and more than half of all articles have at least a relevance of 60%. To be exact, the minimum of relevance obtained is 43% and the maximum obtained by an article is 95%.

On average, all coded articles are rated with 65.22 % of relevance; the median (62.50 %) doesn't vary too much in this case and indicates a uniform distribution without significant outliers.

Table 7: Descriptive Statistics Relevance

N	25
Mean	65.22%
Median	62.50%
Standard Deviation	14.18%
Variance	2.01%
Range	52.00%

Emerging Codes and Thematic Clustering

The codes basically emerged inductively through continuously re-reading the texts, and going back and forth between them, except for the category research framework, because these codes were already deductively given.

ERM Definition

The authors coded 25 articles to, among other things, find out how ERM is defined, in which context it is used and what kind of frameworks are considered by the researcher. In 1 of these articles, a definition for ERM was not even provided, while 13 adopted an ERM framework as a definition and 11 established their own ERM definition from different literature modules.

The majority of the studies, which incorporated an ERM framework, made use of COSO's ERM framework (Vicky Arnold et al., 2012; Beasley et al., 2007). Besides COSO's framework, only one other framework was found in the studies, namely the ERM framework from CAS (Acharyya, 2009). In 9 studies, the ERM Framework from COSO as a solitary definition for ERM was used; 13 combined COSO's and CAS's framework for their ERM definition and 1 study applied the CAS as a solitary framework.

Other authors defined ERM independent from a particular framework as an integrated (Aabo et al., 2005; Hoyt & Liebenberg, 2011), coordinated (McShane et al., 2011; Nocco & Stulz, 2006) and holistic process (Vicky Arnold et al., 2009; Grace et al., 2010) to manage a company's overall risk exposure. Yet others see ERM as the identification, assessment and management of a risk portfolio on a firm-wide enterprise level, involving the support of the senior management (Aabo et al., 2005; Eckles et al., 2011; Hoyt & Liebenberg, 2011)

ERM Variables

In order to identify an ERM using firm, four main streams of proxies and search strings were found in literature. Keyword search, S&P RM Rating, ERM Index and ERM maturity scale are the variables under which the different proxies and search strings can be aggregated. The studies using keywords conducted the search by screening secondary data like the business library Lexis Nexis or annual statements of companies. For financial service firms covered in the Standard & Poor's Ratings Direct database is the risk management

rating from S&P (2006) which now also integrates ERM as a component, deemed to be a valuable variable for ERM detection. Some authors demand a more comprehensive variable and developed as a consequence an ERM index comprising different ERM components. By screening secondary data for these components, a researcher identified ERM using firms. With these proxies, researchers were by then only able to determine if a company is a non-user or user, but a more sophisticated approach is to take possible stages of an ERM implementation into account. Hence some researchers proceeded with a survey using a questionnaire to interview a firm's risk manager or executives responsible for the level of an existing ERM program.

The following table is structured exactly by the ERM variable used in the studies. Four studies were conducted with the aid of two variables each, either keywords in combination with an ERM index or keyword search with S&P's RM Quality Scale.

Table 8: Frequency Table ERM Variables per Study

ERM Variables per Study	fi	pi
Secondary Data	15	0.60
Keyword Search	6	0.24
S&P RM Quality Scale	3	0.12
ERM Index	2	0.08
Double Variable	4	0.16
Keyword search & ERM Index	2	0.08
Keyword search & S&P RM Quality Scale	2	0.08
Questionnaire	6	0.24
ERM Maturity Scale	6	0.24
Not defined	4	0.16
Grand Total	25	1.00

To illustrate the total frequency for each ERM variable, the double variables were distributed to the particular ERM variable, which results in a total amount of 29 variables used for ERM identification. It is visible that the keyword search is the most common used ERM variable in the coded articles.

Table 9: Frequency Table ERM Variables in Total

ERM Variables in Total	fi	pi
Keyword Search	10	0.34
S&P RM Quality Scale	5	0.17

ERM Index	4	0.14
ERM Maturity Scale	6	0.21
Not defined	4	0.14
Grand Total	29	1.00

Keyword Search

The keyword search was adapted in ten articles, which means in 40 % of all articles a keyword search was applied. In six cases, the keyword search was the single variable and in four cases it was used in combination either with an ERM index (2) or a S&P RM Quality Scale (2). The authors found two studies, which were only the announcement of a Chief Risk Officer or equivalent, were chosen as a proxy for ERM. The appointment of a Chief Risk Officer was simply used as a single signal for the adoption of ERM. Search strings contained “announced”, “named”, or “appointed”, in conjunction with the position descriptions of “Chief Risk Officer” or “Director of Risk Management (Beasley et al., 2007; Pagach & Warr, 2010). One study employed CRO as a single search string but therefore in conjunction with an ERM Index (Desender & Lafuente, 2010).

Table 10: Frequency Table ERM Search Strings

Search Strings	fi	pi
Chief Risk Officer	9	0.21
Chief Actuary Officer	1	0.02
Enterprise Risk Officer	2	0.05
Risk Committee	3	0.07
Risk Management Committee	2	0.05
Vice President of Enterprise Risk Management	1	0.02
Enterprise Risk Management	6	0.14
Consolidated Risk Management	4	0.10
Corporate Risk Management	1	0.02
Holistic Risk Management	4	0.10
Integrated Risk Management	4	0.10
Strategic Risk Management	5	0.12
Grand Total	42	1.00

ERM Index

Researchers, who are aware of the limitation of mentioned variables, extended the spectrum of ERM proxies by the development of ERM indexes. Such an index was formed by the authors through incorporating ERM specific components and by further screening secondary data to identify references approving the components. Within the scope of the literature review, the authors detected four studies using an ERM index, two integrating the COSO ERM framework (Desender & Lafuente, 2010; Gordon et al., 2009) in combination with a keywords search and two with a specific index developed (Grace et al., 2010; Mazloomi & Izadpanahi, 2010).

The COSO ERM index is an aggregate measure of ERM with a list of 108 items related to ERM, scoring zero (absence) or one (presence) composited under the eight dimensions of COSO's ERM framework (2004) (Desender & Lafuente, 2010). The COSO ERM effectiveness index is a different approach and was developed to measure the effectiveness of a firm's ERM based on its ability to achieve its strategy, operations, reporting, and compliance objectives. All the information needed to determine the index is drawn from secondary data like annual statements, websites and newspaper articles (Gordon et al., 2009).

Other indexes are a survey conducted by Tillinghast Towers Perrin from 2004 with detailed information on a number of ERM initiatives like market value based risk metric or risk reflection in decision making processes (Grace et al., 2010) and a list of various ERM components not regarding any ERM framework (Mazloomi & Izadpanahi, 2010).

ERM maturity scale

With the ERM maturity scales, the researchers approached the companies or RM responsible roles directly by interviewing them about the company's ERM level. Also here the COSO ERM framework became useful for two articles. In the COSO ERM scales (2), the interviewees received questionnaires with the COSO ERM framework as definition for ERM and the request to state the level of the ERM program in place, from 'complete' over 'partial' to 'no decision made', even to 'no plan to implement ERM' (Beasley et al., 2006; Waweru & Kisaka, 2011). Another article established its own scale also using different stages of ERM adoption, but without providing a particular ERM definition (Gates, 2006). The ERM strategic benefits measure developed by Vicky Arnold et al. (2009) applied for three studies slightly extends the previous mentioned ERM scales by allocating to each level a description and asking the interviewee to evaluate each level on a five point Likert-scale from total agreement to disagreement. In the review of the ERM variables, it became clear that a large number of studies empirically examine the value of ERM using the appointment of a Chief Risk Officer (CROs) or equivalent in order to identify ERM. The appointment of a CRO as an identification strategy is potentially problematic. The CRO may not be using ERM, the CRO could be replacing another CRO, so the appointment could merely indicate a title change, rather than reflect the firm's use of ERM and/or the firm can appoint a CRO, but not report it (Beasley et al., 2007). Obvious is also the extended integration of pre developed templates as theoretical lens in order to identify ERM user and their stages. This is the case with the COSO ERM framework and its components used as ERM index and ERM maturity scale as well as S&Ps RM rating scale. As a consequence aspects regarding capabilities, culture or human resource in ERM user determination are left out. Basically the ERM variables in the studies determined whether a firm has

adopted an ERM or how far the ERM implementation is processed, but only a single study addressed the evaluation of an ERM program's effectiveness and their ability to fulfil an its goals. So far the literature fails to address and explore the actual contributing processes and factors, and falls short on finding a more holistic approach.

Codes & Themes VC Definition

Table 11 includes all provided definitions for value creation listed here as codes and associated measures. Based on multiple measures implied in particular articles, in total the impact on 64 value measures was evaluated in literature. Outstanding is the frequent usage of the value measures Tobin's Q ($fi = 6$) and stock return volatility ($fi = 4$). In some cases ($fi = 11$) the authorss didn't define the value measure prior to data collection, instead they kept the answer range open for the respondents to capture all varieties of VC. Another approach was more qualitative, by asking respondents to evaluate the impact of ERM on a defined qualitative value measure, e.g. a five-point Likert-scale.

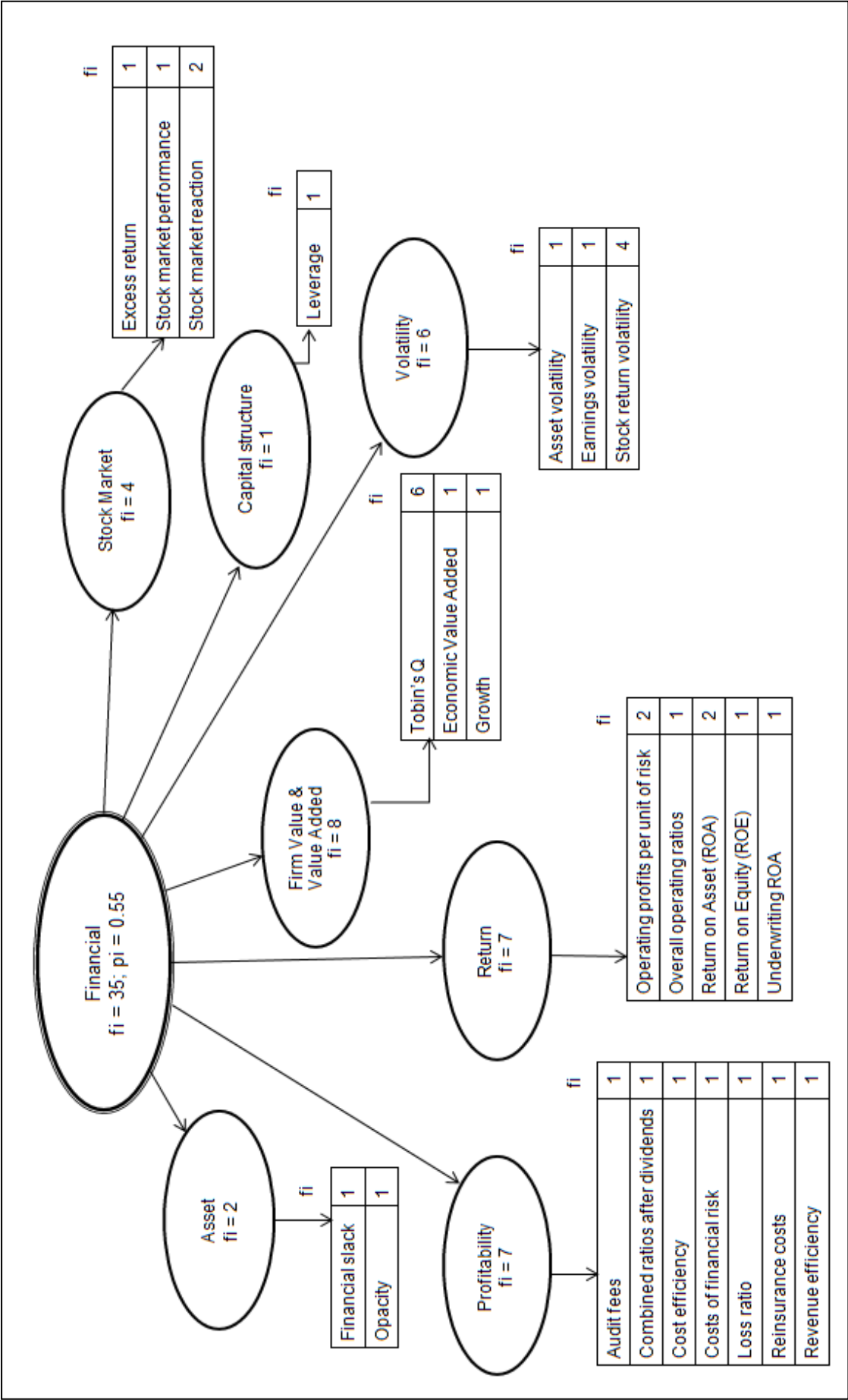
Table 11: Frequency Table Codes VC Definition and Measures

Codes VC Definition	Measures	fi
Absorptive Capacity	Evaluated by respondents on a five-point Likert-type scale	1
Asset volatility	Annualized volatility of assets estimated from seven asset return series	1
Audit fees	Total fee paid to all auditors for both audit and non-audit services	1
B2B E-commerce risk	Evaluated by respondents on a five-point Likert-type scale	1
	Item measures evaluated by respondents	1
Combined ratios after dividends	Gains from overall underwriting activity by including the total underwriting expenses ratio into loss ratio	1
Cost efficiency	Ratio of the costs of a fully efficient firm to the given firm's actual costs	1
Costs of financial risk	Measured by derivative usage (Notional amount of all derivative positions for hedging purpose held at year end, normalized by total assets)	1
Earnings volatility	Standard deviation of the error term from a regression of the firm's quarterly earnings on the prior quarter's earnings	1

Economic Value Added (EVA)	Net Operating Profit after Tax (NOPAT) minus a charge for the opportunity cost of all capital invested in an enterprise (Weighted Average Cost of Capital (WACC) x Capital)	1
Excess return	One-year excess stock market return	1
Financial slack	Proportion of the firm's assets that are cash or cash equivalents	1
Global Business risk	Evaluated by respondents on a five-point Likert-type scale	1
Growth	Market-to-book (MB) ratio and Research and Development expense	1
Impact on Internal Audit	Evaluation of impact on a scale from 1 = not at all to 5 = greatly, by respondents	1
Information Sharing	Item measures evaluated by respondents	1
IT compatibility	Item measures evaluated by respondents	1
Leverage	Total liabilities to assets	1
Loss ratio	Ratio of loss payments made by the company from each dollar of earned premiums in a year	1
Not defined upfront	Illustrative & not measured	7
	Stated by respondents	11
Opacity	Ratio of intangibles to total assets	1
Operating profits per unit of risk	Ratio of Return on Asset (ROA/stock return volatility)	2
Organizational flexibility	Item measures evaluated by respondents	1
Overall operating ratios	Pre-tax operating profitability which includes its return on investment and underwriting revenues and expenses	1
Reinsurance costs	Ratio of reinsurance ceded to sum of direct business written and reinsurance assumed	1
Return on Asset (ROA)	Net income divided by total assets	1
	Ratio of income before extraordinary items divided by total assets	1
Return on Equity (ROE)	Net Income divided by Book Equity	1

Revenue efficiency	Ratio of observed revenue to the maximum revenue of a fully efficient firm with the same input quantities and output prices	1
SOX 404 implementation difficulty	Item measures evaluated by respondents	1
Stock market performance	Standard deviation of stock prices	1
Stock market reaction	Average abnormal return around hiring announcements	1
	Cumulative abnormal return around hiring announcements	1
Stock return volatility	Annualized standard deviation of daily stock returns	1
	Annualized standard deviation of monthly stock returns	1
	Standard deviation of the firm's daily returns over the year	1
	Standard deviation of weekly stock returns	1
Strength of control environment	Item measures evaluated by respondents	1
Tobin's Q	Market value of equity plus the book value of liabilities divided by the book value of assets	6
Trust	Item measures evaluated by respondents	1
Underwriting ROA	Underwriting income divided by total assets	1
Grand Total		64

In the next step, codes were grouped by making sure that codes are homogeneous within a group and heterogeneous among other groups. Afterwards, themes emerged and are now illustrated with assigned codes and their absolute frequency shown in Figure 10. The themes were further compromised in superior themes, separating financial and non-financial benefits. As financial benefits can be assigned VC measures regarding stock market, volatility, profitability, return, assets, capital structure and firm value or value added. Non-financial themes gathered organizational structure, process, risk and communication measures. The majority of benefits measured are financial benefits ($fi = 35$). Especially the measurement of an ERM's impact on firm value ($fi = 8$), return ($fi = 7$) and profitability ($fi = 7$) was found in literature. Also the evaluation of ERM's influence on volatility ($fi = 6$) and stock market ($fi = 4$) played an important role in the articles. An ERM's impact on organizational structure ($fi = 4$), risks ($fi = 3$) and communication ($fi = 3$) put forth a more qualitative approach in measuring VC. After careful review of these measures, the authors observed missing approaches. An ERM impact on a company's cash flow or on its capital costs appeared to be neglected in literature.



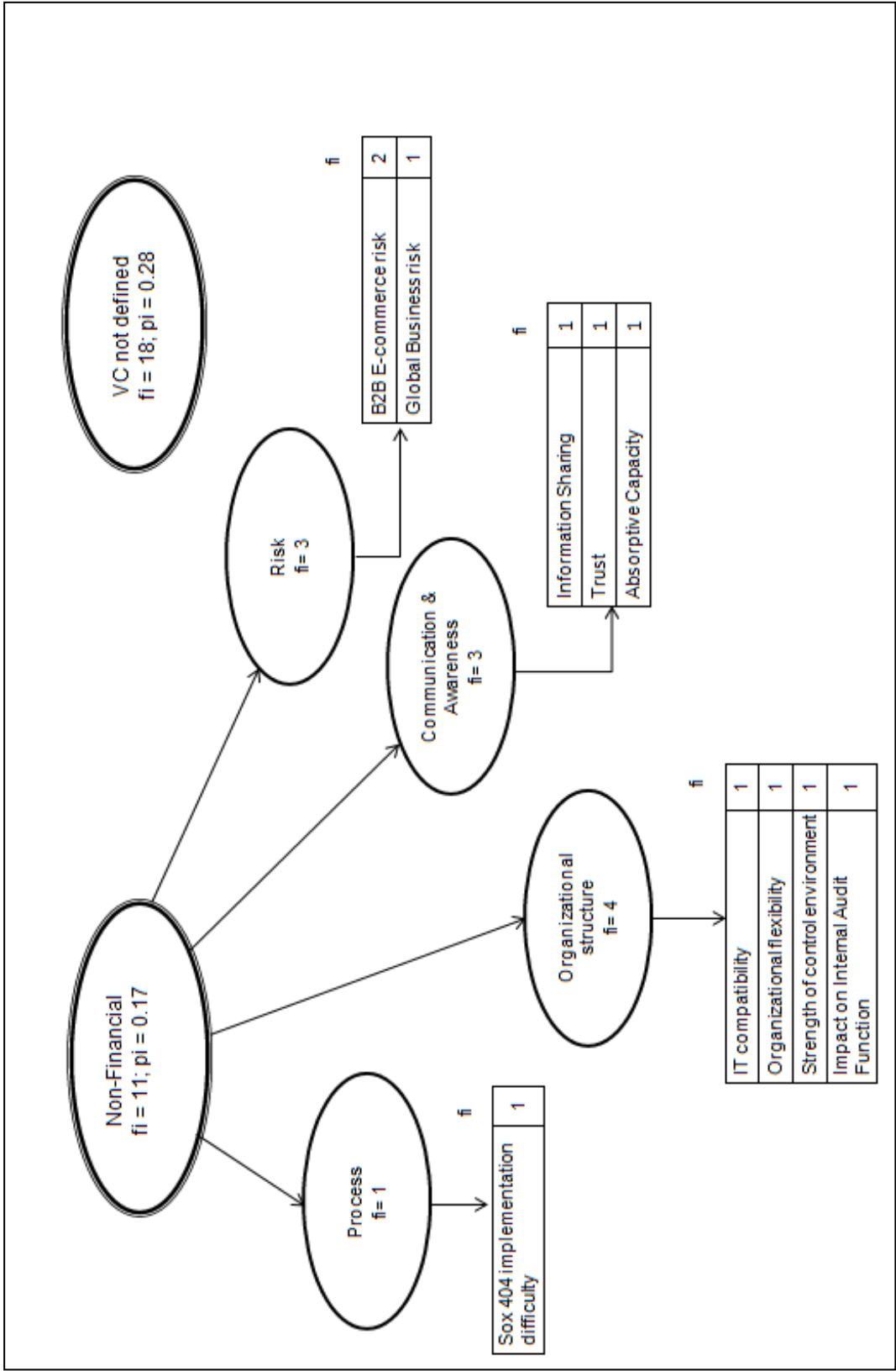
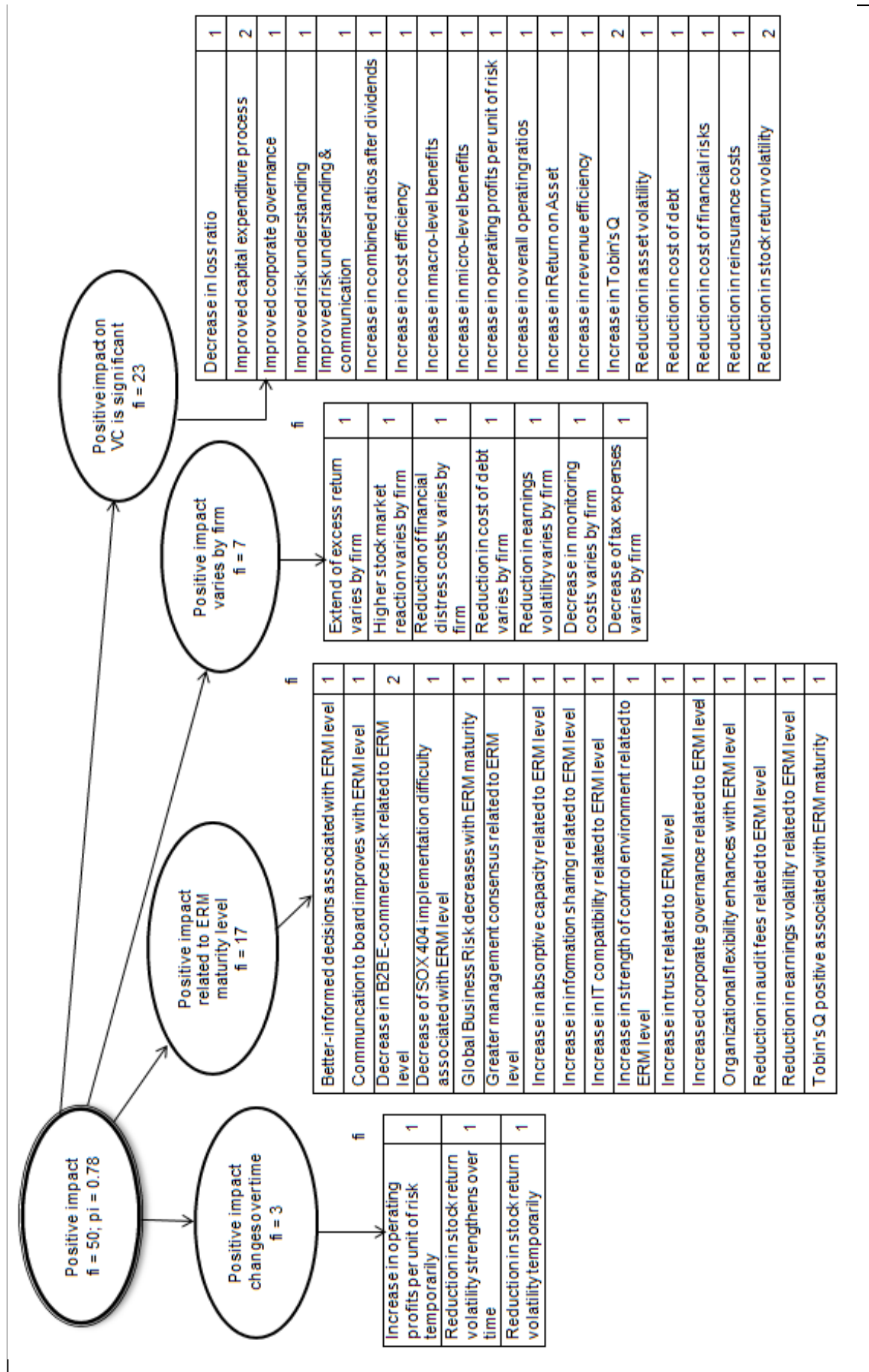


Figure 5: Themes for Definition VC

Impact of ERM

Also for the impact of ERM, the codes were grouped into expressive themes, illustrated on the next two pages in Figure 10. In general, three basic forms of impact are identified in the literature as positive, negative or without significant impact. In total, the impact of ERM on 64 VC measures was examined. In 78 % of the investigations, a positive impact could be detected. This positive impact was either determined in general ($fi = 23$) or varied by different determinants. Studies integrated and measured the impact of different ERM stages on VC, in consequence, positive impact varies by ERM maturity level in 17 cases. Every company has different firm characteristics leading to a different extent of ERM's positive impact on VC measures ($fi = 7$). The authors also found that in three cases, the influence of ERM changed over time, by becoming stronger or disappearing over time. In 17 % of the cases, researchers failed in finding an impact of ERM on VC and in 5 % they even experienced a negative impact of ERM. As mentioned in the prior sector, some VC measures weren't defined upfront in order to receive open-minded statements about ERM benefits directly from respondents. The impact of these benefits are now included in the figure underneath. In this context, as new benefits appear the reduction of cost of debt and better capital expenditure process. Respondents also named improved corporate governance, better-informed decisions and increased risk understanding as benefit experienced from ERM.



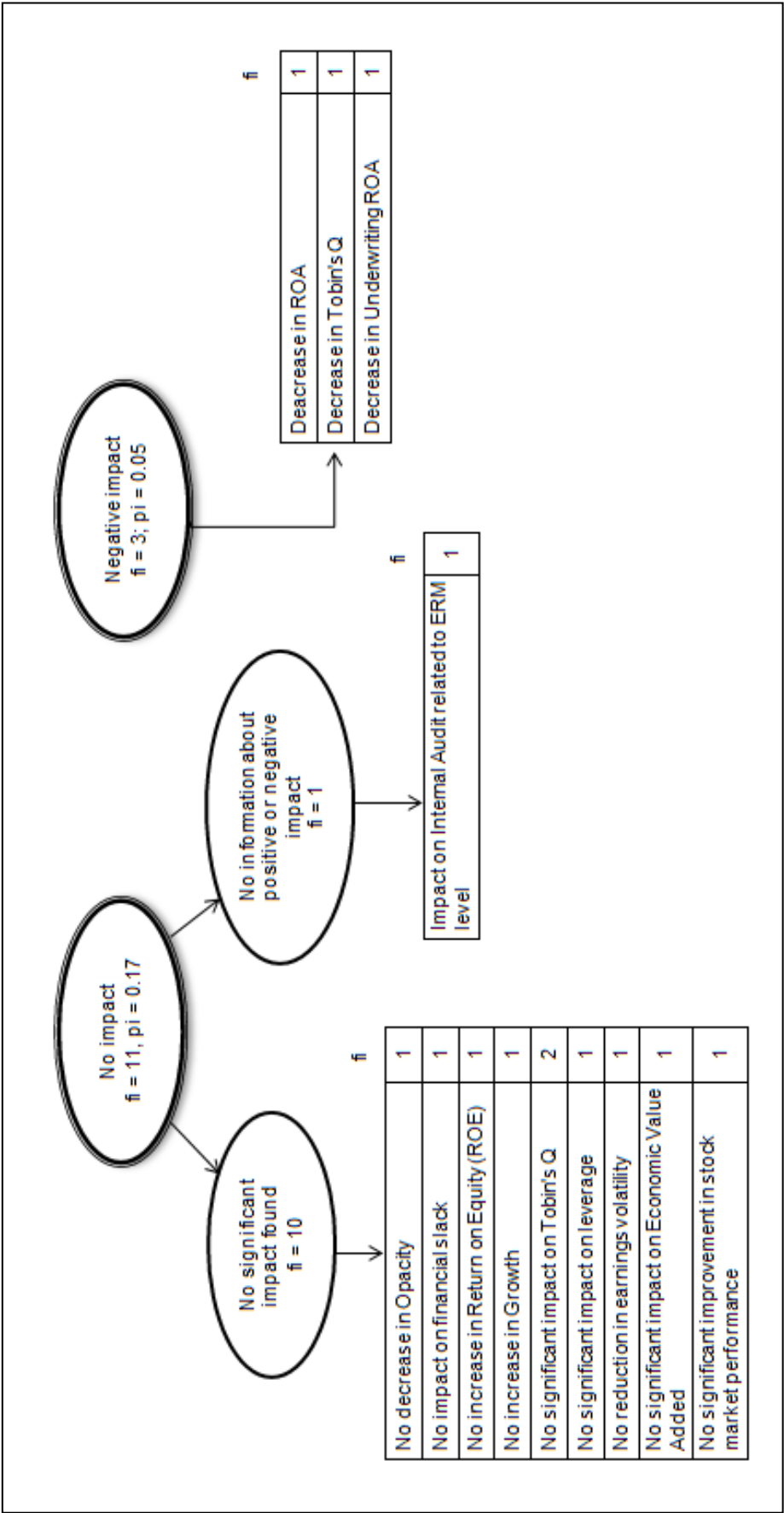


Figure 6: Themes for Impact ERM

Relationship ERM Impact & Definition VC

With the comparison of the themes emerged from VC definitions and ERM impact, the authors provides a better overview of different kinds of ERM influence on a company's value and performance aspects. Studies examining the impact on firm value & value added or return measures failed to find consistent results. Findings show positive impact as well as not significant and even negative results. For firm value & value added measure were in fact more negative respectively not significant outcomes identified than positive. Whereby for profitability (financial benefit), risk and communication (non-financial benefit) a throughout positive impact was detectable. For stock market, volatility and organizational structure measures positive as well as not significant impact were examined. In contrary, the authors couldn't find a significant influence of ERM on asset or capital structure.

Table 12: Relationship Themes ERM Impact & Definition VC

Impact ERM & Definition VC	fi
Negative	3
Return	2
Firm Value & Value Added	1
Not significant	11
Asset	2
Organizational structure	1
Return	1
Stock market	1
Volatility	1
Firm Value & Value Added	4
Capital structure	1
Positive	50
Communication & awareness	3
Organizational structure	3
Process	1
Return	4
Risk	3
Stock market	3

Impact ERM & Definition VC	fi
Volatility	5
Firm Value & Value Added	3
Profitability	7
Not defined upfront	18
Grand Total	64

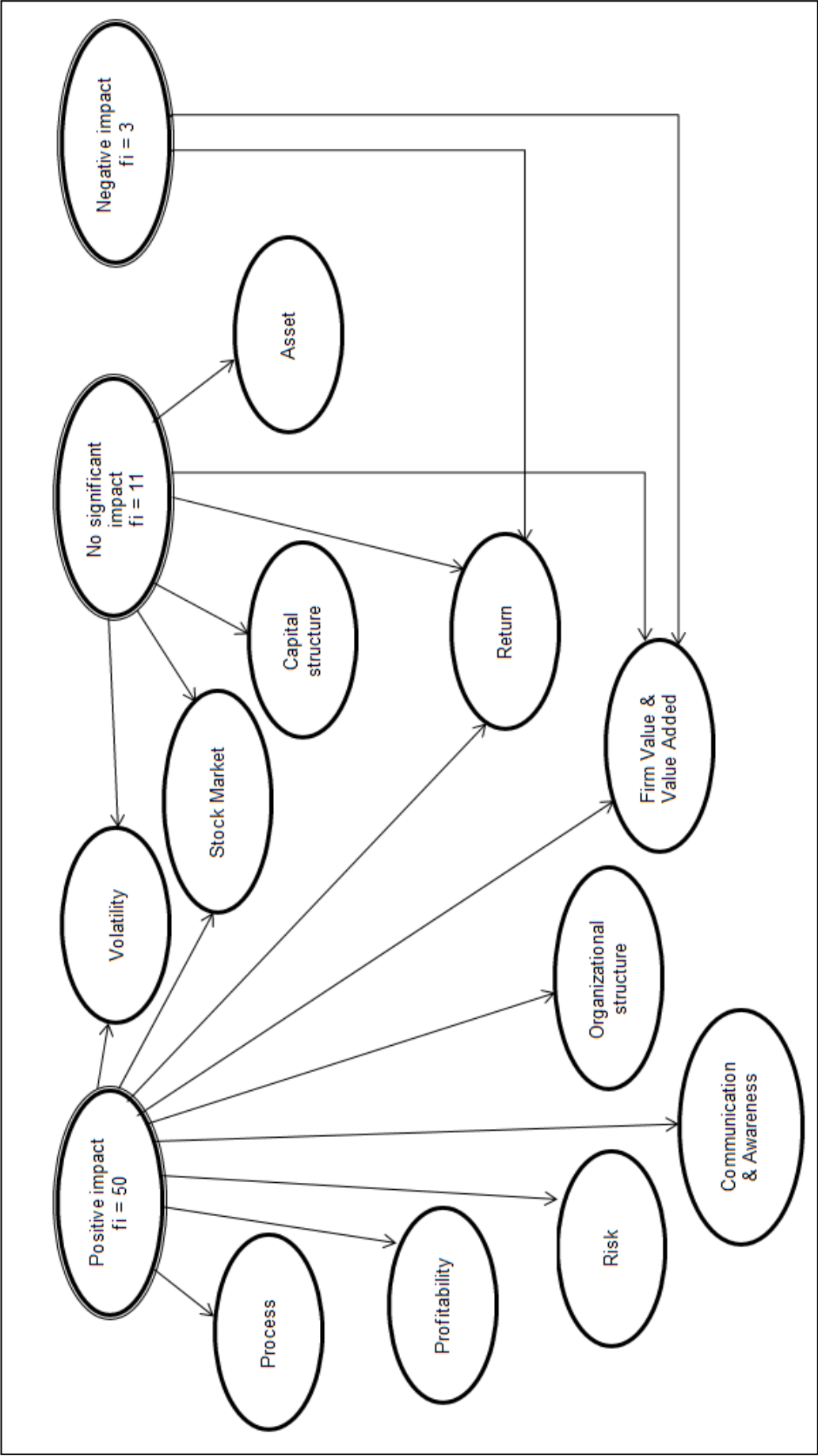


Figure 7: Relationship ERM Impact & Definition VC

Research Framework

Table 13 shows the deductively developed codes for the category research framework as well as the absolute and relative frequency for research design, research methodology and method of data collection with the executed data analysis. Distinctive is the high amount of quantitative studies found in literature; in 80% ($f_i = 20$) of the articles, the study was conducted with a survey, mostly with data collected from secondary sources and then statistically analysed. Even though the authors were operating in a nascent research field, only four executed a qualitative research design and one used with the mixed method a more progressive approach.

Table 13: Frequency Table Research Framework

Codes Research Framework	f_i	p_i
Mixed	1	0.04
Survey & Case studies	1	
Questionnaire (open-ended & close-ended), Description of Content & Statistical	1	
Qualitative	4	0.16
Case study	2	
Description of Content	2	
Literature review	2	
Description of Content	2	
Quantitative	20	0.80
Survey	20	
Secondary Data, Statistical	13	
Secondary Data & Questionnaire (close-ended), Statistical	3	
Secondary Data, Comparison & Logical Conclusion	1	
Questionnaire (close-ended), Statistical	3	
Grand Total	25	1.00

Industry

A majority of the authors addressed in their research process multiple industries. Here are only the industries listed which explicitly mentioned and composed at least 10% of the study's sample size, the rest are consolidated under the code "Others". As it is shown in Table 14, the banking and insurance industry (22%) is the most frequently observed sector in the ERM/VC literature. Financial Service Investment (12%), Trading & Services (10%) and Manufacturing (10%) were also quite common. Reason for the focus on the financial industry might be by regulations with enhanced disclosure requirements and therefore better access to data (Beasley et al., 2007; Pagach & Warr, 2010).

Table 14: Frequency Table Industry

Codes Industry	fi	pi
Banking & Insurance	11	0.22
Financial Services Investment	6	0.12
Trading & Services	5	0.10
Manufacturing	5	0.10
Energy	2	0.04
Utility	2	0.04
Education	1	0.02
Technology	1	0.02
Pharmaceutical	1	0.02
Property/Real Estate	1	0.02
Industrial Allied	1	0.02
Others	11	0.22
Not defined	2	0.04
Grand total	48	1.00

Sample Sizes

The reviewed articles contained two case studies and two literature reviews, thus these four articles are not included in the classes built for the frequency Table 15. The rest of the studies applied a survey research with sample size ranging from 12 to 532 companies or observations. The class size is 50, whereby the last class is open to capture the two outliers (528, 532). The majority of the studies used a sample size between 1 and 150 companies.

Conspicuous was for studies within the class under 50, that their authors mentioned a low sample size as limitation.

Table 15: Frequency Table Sample Size

Class Interval Sample Size	fi	pi
1 to <50	4	0.16
50 to <100	4	0.16
100 to <150	6	0.24
150 to <200	2	0.08
200 to <250	2	0.08
250 to <300	1	0.04
>=300	2	0.08
various articles	2	0.08
one case study	2	0.08
Grand Total	25	1.00

Geography

Table 16 gives an overview for which regions the studies were conducted. Studies examining the ERM/VC nexus focus mainly on North America and especially USA. Europe stays barely considered, although a study by Deloitte (2008) with 151 companies found that Europe's companies are further ahead with their ERM implementation and have higher developed ERM programs than companies in other continents. South America or Australia weren't addressed in any of the articles, whereby the study by Deloitte (2008) indicates a high interest in ERM of companies in South America and in Australia the now widely used AS/NZs (2004) framework emerged.

Table 16: Frequency Table Geography

Codes Geography	fi	pi
North America	3	0.12
North America & Europe	3	0.12
USA	11	0.44

Canada	2	0.08
Iran	1	0.04
Malaysia	1	0.04
Nairobi	1	0.04
not defined	3	0.12
Grand total	25	1.00

Study Period

In 25 reviewed studies, not only one-year periods were observed, but rather two-year or even ten-year periods were taken into account. For the calculation of the frequency distribution, the total frequency of every year observed is calculated and grouped in clear classes, displayed in Table 17. The classes range from 1990 to 2011 with a class interval of two years. The periods from 2002 to 2003 ($f_i = 13$) and 2004 to 2005 ($f_i = 13$) were studied in particular. What is interesting is that around this time, major ERM frameworks emerged (CAS, 2003; COSO, 2004). Even though researchers addressed the periods from 2007 to 2009, the changes in the ERM impact during and after the financial were barely taken into account.

Table 17: Frequency Table Study Period

Class Interval Study Period	f_i	p_i
1990 - 1991	2	0.02
1992 - 1993	6	0.07
1994 - 1995	8	0.09
1996 - 1997	8	0.09
1998 - 1999	10	0.11
2000 - 2001	11	0.12
2002 - 2003	13	0.14
2004 - 2005	13	0.14
2006 - 2007	12	0.13
2008 - 2009	7	0.08
2010 - 2011	2	0.02
Grand total	92	1.00

Three Propositions derived from the findings

Based on the findings, the authors developed the following propositions for a further research agenda. The vast majority of studies used a CRO appointment or, in general, keywords search as an ERM variable. Basically the authors aimed at determining whether an ERM program exists or not. Only a few researchers enhanced the ERM dummy variables to include an ERM's maturity level. One study came up with an advanced approach to proxy ERM programs by evaluating an ERM's effectiveness. None of these studies observed specific components of ERM influencing VC, but rather applied an ERM index and a S&P RM quality scale merely to determine if an ERM program is in place.

Even though the authors looked out for direct linkage between ERM theories and VC, only two articles explicitly mentioned a direct connection. Authors claimed the proper match within ERM effectiveness, measured by the ability to achieve COSO's four objectives relative to strategy, operations, reporting and compliance, as the basic factor for VC (Gordon et al., 2009). Yet other researchers argued that combining individual risks in risk portfolios lead to better recognized natural hedging and in turn produces a greater risk reduction per dollar spent (Eckles et al., 2011). Whereas findings in literature indicate a positive impact of ERM on VC, it is not carved out whether or how observed benefits can be assigned to TRM or can be defined as added benefit of ERM.

Hence, a research agenda, considering which components of ERM actually create value and what benefits are results of TRM or ERM in particular, is expected to advance the research field. The authors introduce the first proposition:

Proposition 1: Identification of specific components and processes of ERM theory contributing to firm value and evaluation of an added benefit of ERM compared to TRM.

The findings suggest that the choice of determinants influences the outcome, but the authors struggle to find the determinants. Such is true also for example with larger firms, with a lower cash ratio or with greater financial leverage, that they more likely to benefit from ERM. Ownership characteristics or type of industry also influences the extent of benefits a company can experience from ERM. A few studies found the positive impact varying from firm to firm. So far, the researchers focused on the financial service industry and especially insurance firms. In order to make a general statement on the VC effect of ERM, it is necessary to study ERM programs throughout different industries. Moreover, partially relatively small sample size may reduce the extent to which results may be generalized. The second proposition developed is:

Proposition 2: First step to a further research agenda is the solicitation of a same base.

The authors found around 30% of the studies examining an ERM's impact for only one year and a majority of studies remaining under five-year observations. These short and mid-term tests may be too weak to be able to pick up changes. ERM could take a longer period of time to implement and reap benefits from its processes and instruments. A large amount of studies used profitability or return measures for VC evaluation. Another prominent proxy applied was Tobin's Q for firm value. Only one article examined an ERM's impact by the usage of a value added measure, in that case Economic Value Added (EVA),

a measure based on profits. Cash flow developments remained utterly disregarded, either in terms of cash flow volatility or in common firm value (Discounted Cash Flow method) or value added (Cash Value Added) measures. Impact on capital costs or in detail Weighted Average Cost of Capital (WACC) wasn't directly examined but appeared in studies with an open answer range for VC: The authors believe a more cash flow based approach, a focus on capital costs and observation of ERM effects over longer periods will be of particular advantage for the research field. Therefore, the authors introduce the third proposition:

Proposition 3: Scrutinization of profitability based VC measures and consideration of capital costs and cash flow based measures as well as the monitoring of ERM benefits over longer periods.

Conclusion and Discussion

Researchers found evidence of a positive correlation between the implementation of an ERM program and Value Creation, but failed to enlighten the whole concept of the ERM / VC connexion. The study provides a systematic analysis of the current literature regarding the impact of ERM on VC and introduces three propositions for a further research agenda. The authors identified 25 articles examining the ERM / VC nexus and found results on the impact of ERM in three forms, positive, negative or not significant. The authors acknowledge a broad range of quantitative and qualitative benefits, anticipated to generate value short- or long-term as VC. The systematic literature review let financial and non-financial measures for VC emerge. The majority of VC measures detected can be summarized under financial benefits, including cost reduction, profit or return increase, volatility decrease leading to firm performance improvement or directly proxied by firm value measures. Studies using non-financial benefits for VC measure, including process, organizational structure, communication and risk factors, basically resulted in the finding of a throughout positive ERM impact. The power of the qualitative measures in these cases might be questionable, because of the involvement of the personal opinion of respondents. The common firm value or value added measures using cash flow or cost of capital as input factors stayed highly disregarded. The findings suggest a consideration of capital cost and cash flow in VC measurement. Findings demonstrate that the majority of studies experienced a positive ERM impact. However, the authors also found the positive impact varying by ERM maturity level, by firm or over time. Results indicate that studies partially experienced for a single VC measure different outcomes, from positive over not significant to negative. The impact varying from firm to firm might be due to different determinants. Although a collective concentration in literature on North American companies in banking and insurance industry was detectable, differences in firm sample on entity size, ownership characteristics, organizational and environmental factors was present. Furthermore, studies capturing specific events were utterly left out. Based on varying determinants, it is hardly possible to make a comprehensive statement on the general impact of ERM on VC. The literature needs to conceptualize and call on a same base of determinants.

Results show ambiguities in the actual added benefit of ERM. Studies applying the S&P RM rating found a value increase for firms with a weak or adequate RM, so basically

TRM. Yet other studies found a value creation for strong and excellent RM firms, defined as ERM firms, assigning the value impact entirely to ERM and ignoring the possible proportion of TRM. Researchers didn't exclude, whether typical traditional risk management activities, such as hedging and corporate insurance, are the driving forces behind VC. However, the authors propose the explicit extinction between TRM and ERM benefits as a valuable approach towards a more advanced research field.

A prominent proxy identified during the systematic review was the CRO, but was simultaneously criticized for its limitations. The results display that the ERM variables were primarily used as dummy variables even for particular developed ERM indexes. Studies with an ERM maturity level as variable merely asked about plans to implement ERM or partially respectively fully implied ERM programs, leaving out information about components of ERM being implemented from stage to stage. An ERM variable using effectiveness evaluation admittedly focused on the strength of a program, but without insight on the valuable aspects of ERM. As a result the literature stayed without identification of value creating capabilities, processes, cultures and human resources of ERM programs. One study gave impetus in this direction by identifying the CRO and risk committee as value enhancing factors, when associated with ERM implementation. ERM roles and responsibilities emerge as a crucial factor in ERM deliberations. So, as a result, the authors propose the focus on substantial components in the ERM / VC nexus.

This study might be limited to the relatively small sample of high qualified articles, which also brings further evidence of the pre-pragmatic stage of the research field.

The findings summarize a too early stage of comprehensive quantitative studies, without the determination of efficient and reliable ERM variables as well as the lack of knowledge about essential value enhancing factors of ERM. After a systematic review of literature it is not possible to make a general statement of the value creating effects of the ERM programs. So the researchers need to step backwards and take the developed propositions into account.

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