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MODELS OF DETECTION OF MANIPULATED FINANCIAL STATEMENTS AS PART OF THE INTERNAL CONTROL SYSTEM OF THE ENTITY

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***Abstract**: Accounting remains the main source of information about the company for most users of financial statements. At the same time, the creators and users of financial statements want to get the best quality and quantity of information as far as possible. Although users of financial statements are unable to obtain with absolute certainty statements that are true and fair, they need to know how much they can rely on financial statements. This paper deals with reducing the information asymmetry, especially on the part of users of financial statements. The paper analyses selected models of the detection of manipulated financial statements as a possibility to reduce the risk of accounting fraud and use as part of an internal control system of an entity or as a management tool for corporate governance or internal auditors. A risk analysis was performed on selected models; the Beneish model, the CFEBT model, the Jones Non discretionary Accruals model and selected bankruptcy models to detect accounting frauds in specific case studies of selected accounting unit.*

***Keywords**: financial statements, fraud, fair and true view of accounting, detection of the risk of manipulating financial statements.*

Introduction

According to the Act on Accounting, accounting entities are obliged to keep the books in such a manner to ensure that the financial statement based on them gives a true and fair view of the subject of accounting and financial situation of the entity.

The urgency of the issue of distortion of the true and fair view of accounting is manifested by both the consequences of frauds of big dimensions and the frequency of activities of distortion of the data distributed to several areas in the major part of relatively small firms. The struggle against the so-called creative accounting, which is definitely beyond the true and fair view of accounting, assumes importance especially after the scandals of a number of prominent European and American firms, including national cases. Conditions for corruption, attempts to modify the tax liabilities or expediency are based on bookkeeping, even though it is only a tool for achieving the goal. All items of financial statements should be viewed truly and fairly, not only the profit and stock capital. The view is true when it reflects the real state of things. The term fairness describes the use of accounting methods. When these are applied in the right way we say that the view is not only true but also fair. There are various valuation methods, such as property valuation method or discounted cash flow method, and in principle each of the methods leads to a different result. It is obvious that in practice you can find purposeful manipulation. If you look closely at the issue of financial statement you can say that it is not

only an accounting problem. This is especially true in the context of the harmonization of the national accounting systems. External auditors have to comply with legislative regulations. In the Czech Republic, they are bound by the Act 93/2009 Coll., On Auditors, by the Code of Ethics and by international accounting standards and related regulations, including the internal regulations of the Czech Chamber of Auditors. The auditors are also obliged to evaluate the risk of accounting fraud in compliance with ISA 240 standard. On the other hand, decisions made by users on the basis of trust in the financial statements have been increasingly becoming a complicated problem. A wide range of financial indicators, rating and default models are available but these often provide conflicting results in comparison. In addition, methods of accounting data manipulation are becoming more and more original and imaginative and financial statements´ creators use methods of creative accounting, designingongoing transactions reflexes into the accounting statements. Similarly, the pressures of the market, the owners and the importance to finance necessary activities have been increasing.

The paper analyses the possibilities of detection of manipulated financial statements to reduce the risk of financial statement manipulation above true and fair accounting and the risk of accounting fraud. This paper presents a possible tool to use as part of an internal control system of an entity or as a management tool for corporate governance or internal auditors to reduce the information asymmetry, especially on the part of users of financial statements.

Methodology and Data

Managers often try to "adjust" the amount of reported profit in which they are financially involved, either towards the maximum or to extend their loss, and thus reach a higher profit in the following accounting periods. A bad management attempt to postpone the firm bankruptcy by distorting the real profit. Other possible reasons are investors' pressure or to conceal a financial risk of the respective company, an effort to be awarded subsidies or loans or an effort to reduce the tax liability. National research studies around the world such as (Brennan, McGrath, 2007) and (Jones, 2011) show that there is growing pressure in enforcing transparency and business ethics, which is true not only in publicly traded companies but also, for example, the misuse of subsidies by prominent entities, substantiation in accounting. Demands are namely placed on administrative bodies whose responsibility it is to guarantee the development of corporate culture and to promote shared values inside the company. You can also find more information in studies of Global Economic Crime Survey of the major auditing companies (Ernst&Young, 2012), (PriceWaterhouseCoopers, 2014), that draw attention to the growing problem of crime in the economy, which relate to fraud and corruption inside corporations. Chartered Institute of Management Accountants published a guidebook of risk management where the importance of issuing a plan of reactions after a fraud is detected and fraud prevention is highlighted. The guidebook also lists risk areas of fraud, its definition followed by case studies in reporting fraud. (CIMA, 2009)

Prevention and detection of accounting fraud is also engaged in Dave Tate´s publication. Tate lists typical operation through which accounting fraud can be committed in 15 major risk areas such as liabilities, expenses, assets of increase, cost of goods sold or equity. (Tate, 2011).

Pamela S. Manton in the book called Using Analytics to Detect Possible Fraud provides case studies of four companies. The financial statements of the selected companies are subjected to examination via the individual tools and techniques appointed to examine accounting fraud. These case studies include the following techniques: liquidity ratios, profitability ratios, horizontal analysis, vertical analysis, cash realized form operations, analysing cash realized from operations to net income from operations, the Beneish M-Score model, Dechow-Dichev Accrual Quality, Sloan´s Accruals, Jones Non discretionary Accruals, The Piotroski F-Score

model, Lev-Thiagarajan´s 12 Signals, Benford´s Law, Z-score analysis, Correlation, Regressions analysis (Mantone, 2013).

Using technology to detect risk of manipulated financial statements, i.e. detection of the risk of accounting fraud, is not an easy decision and requires sophisticated professional qualification of people who analyse the financial statements. A wide range of ratios, bankruptcy and credibility models, which often provide users with conflicting results, often complicates decisions on the financial health of a company. Based on previous research of the possibility of detection of manipulated financial statements, the CFEBT model was designed and based on the hypothesis of a relationship between a loss and an increase in cash flow in the period of five years, i.e. whether the sum of their value in five years with minor variations lead to a similar result. After that the CFEBT model was tested to identify possible risks of manipulated financial statements in case studies of creative accounting for the conditions of Czech Accounting Standards. Furthermore, the results of case studies detecting risk of manipulated financial statements are compared with the results of the Beneish model that tests the risk within the US GAAP accounting system and IFRS (Drábková, 2013). At the same time, the CFEBT model has been studied on case studies of sample areas of creative accounting techniques and the intensity detection of risk of manipulated financial statements beyond true and fair view of accounting (Drábková, 2013). The CFEBT model was designed as one of the possible tests of detection of risk of accounting fraud as one of the auditors' tests in relation to the ISA 240 international standard on auditing. This paper analyses the different possibilities of detecting the manipulation of financial statements. It is also useful for owners and other users of financial statements for the detection of risk of manipulation of financial statements.

The risk analysis was performed on selected models: the Beneish model, the CFEBT model, the Jones Non discretionary Accruals model to detect accounting frauds in specific case studies of a selected accounting unit. In order to find answers to defined questions, a case study of an accounting entity was designed because the Altmann bankruptcy model had the same results for this selected unit in terms of Czech accounting standards (CAS) and International Financial Reporting Standards (IFRS). (Kubíčková, 2011).

Results

The given the entity was processed using a case study for the period of five years. Also, the entity had a profit of more than seven million CZK and does business in the service sector. The financial statements of the sample entity were subjected to an analysis of different models in order to evaluate the possibility of users (auditors) to detect the risk of accounting fraud and the manipulation of financial statements beyond the true and fair view of accounting.

The CFEBT model

The CFEBT model is defined as follows:

$$(\Sigma_{(t=1)}^{5} [\![CF_t]\!] - \Sigma_{(t=1)}^{5} [\![EBT_t]\!]) / (\Sigma_{(t=1)}^{5} EBT_t) \times 100$$

Where:
CF …..Increase of cash flow in period t

EBT ….. Earnings before taxes in period t

If , there is a high risk of breaching a true and fair view of the accounts (Drábková, 2013).

Materiality significance ranges between 5 and 10%, taking into account the individual circumstances of the entity, as it did during the audit of financial statements by an external auditor.

Materiality of 5-10% is considered in this paper.

Table 1: EBT and CF Accrual in the years 2009- 2013

	2009	**2010**	**2011**	**2012**	**2013**	**Sum**
∑ VH (EBT) v mil. CZK	11560	10594	9160	8663	7161	47138
CF Accrual in mil.CZK+corporate income tax	3455	5925	8818	5870	3361	26799
CFEBT before modification (adjustment)	x	X	X	x	x	**43%**

Source: author

Table no. 1 contains the results of detecting manipulation risk in the financial statements through the CFEBT model in the accounting periods of 2009 to 2013. The CFEBT revealed high levels above the materiality in CF and EBT accruals in the years of 2009 to 2013. After calculating the value of the CFEBT model, it represents 43% of the value, thus well above consideration materiality 5-10.

The reasons for this discrepancy may be defined in the context of both the accounting system of International Financial Reporting Standards (IFRS) and Czech accounting standards (CAS) so that in the period:

Increased cash flow by maximizing the operating cash inflows or minimizing operating cash outflows.

Revenues were not reported to the created cash flow within the true and fair view of the accounts because it does not meet the criteria for revenue reporting or the CAS's, for example, because of advanced payments of unvoiced unrealized supply of work in progress. In case of manipulated accounts revenues were potentially undervalued for example by mispricing or by not-recognized orders (earning management).

The costs reported in the period are not reflected as expenses in particular, the reported cost of the risk to be borne by an entity in future periods as accounting allowances and reserves. The case of manipulated financial statements may potentially lead to overvaluation of costs using techniques of creative accounting using methods as Big bath, tax optimization, artificial costs without implementation costs or formally recognized contractual penalties (earning management).

To evaluate the risk of manipulation of financial statements beyond the true and fair presentation of financial accounting statements prepared in accordance with IFRS or CAS, it is necessary to analyse the development of risk items above the mentioned guidelines of the discrepancy between development and cash flow items reported in the financial statements. We will focus on the adjustment EBT in the analysis accounting items of the financial statements in the years 2009-2013.

Table 2: Modified CFEBT - analysis of significant items in the years 2009-2013

Adjusting the CFEBT for significant items of the financial period 2009 – 2013	
Σ EBT before adjustment	**47138**
EBT modifications :	
Costs: ∑ depreciation + +	17732
Costs: changes in accounting provisions and reserves + + / - -	-829
Change in receivables of the period + - / - +	10295
∑ Increase (decrease) CF from investment activities - - / + +	-14867
Change in liabilities representing the costs + + / - -	-276
Change in stocks + - / - +	169
Change in received credits and loans + + / - -	-72
∑ Dividends paid - -	-34106
∑ Modified EBT	**25184**
∑ CF increases of the period	**26799**
CFEBT after modification	**6 %**

Source: author

In Table 2, the value of the modified CFEBT was significantly reduced from 43% to 6%, so it fulfils the considered materiality for fair and true view of financial statements. Increased risk of manipulation of financial statements for users of financial statements can therefore be considered beyond the true and fair view. Users of financial statements who need to decide about the credibility of financial statements in terms of CAS and IFRS can be advised to perform a more detailed analysis of risk items within the accounting and taking into account the specifics defined by the true and fair view of the accounts of the national accounting systems.

The Beneish model

The Beneish M-Score Model is a mathematical model based on eight variables. It was designed by Professor Beneish to evaluate the motivation to manipulate earnings.

The M-Score is calculated as follows:

$$M = -4.84 + 0.92*DSRI + 0.528*GMI + 0.404*AQI + 0.892*SGI + 0.115*DEPI – 0.172*SGAI + 4.679*TATA – 0.327*LVGI$$

Where:

DSRI - Days' sales in receivable index in the t and t-1 period.

GMI - Gross margin index as the ratio of gross margin and sales in the t and t-1.

AQI - Asset quality index.

SGI - Sales growth index.

DEPI - Depreciation index.

SGAI - Sales and general and administrative expenses index.

LVGI - Leverage index of total debts to total assets in the t and t-1.

TATA - Total accruals to total assets in the t-period.

If M > -2.22, a firm is likely to be a manipulator (Beneish, 2001)

Table 3: Assessing the fraud indicators of the Beneish model

DERIVED VARIABLES	FRAUD INDICATOR	2014/ 2013	2013/ 2012	2012/ 2011	2011/ 2010	2010/ 2009	2009/ 2008
Other L/T Assets [TA-(CA+PPE)]		0	842	195	173	117	49
DSRI	**⩾1,465**	1,026	1,226	1,104	0,322	0,922	***1,889***
GMI	**⩾1,193**	-0,032	-23,819	0,993	1,019	0,998	0,993
AQI	**⩾ 1,254**	0,000	***4,397***	1,135	***1,485***	***2,357***	0,922
SGI	**⩾1,607**	1,049	0,899	0,962	0,921	0,947	0,918
DEPI	**⩾1,077**	1,031	1,189	0,966	0,949	***1,458***	0,917
SGAI	**⩽1,041**	***0,945***	***0,980***	***1,008***	***0,991***	***0,907***	1,110
Total Accruals/TA	**⩾0,031**	-0,094	-0,098	-0,098	-0,097	-0,069	-0,166
LVGI	**⩾1,111**	***1,900***	0,966	0,948	0,929	***1,122***	1,024

Source: author

In Table 3 are identified the fraud indicators of the Beneish model between years 2008 – 2014. The results can be assessed in details using the Beneish indices – fraud indicator (Bell, 2009):

1.Asset Quality Index (AQI): ≥ 1.254 Improper capitalization of expenses.

2. Days Sales in Receivable Index (DSRI): ≥1.465 Asset overstatement: inflating the value of receivables.

3. Depreciation Index (DEPI): ≥1.077 Earning manipulation: inflating the useful life of assets and increasing income

4. Gross Margin Index (GMI): ≥1.193 Economic difficulty.

5. Leverage Index (LVGI): ≥1.111 Earning manipulation.

6. Sales General & Administrative Expense Index (SGAI): ≤1.041 Earning manipulation.

7. Sales Growth Index (SGI): ≥1.607Revenue recognition: fictitious revenue.

8. Total Accruals (TATA): ≥0.031 Revenue recognition

Although there are identified fraud indicators: Asset quality index (AQI) in years 2010, 2011, 2013 and Sales and general and administrative expenses index (SGI) in years 2009 – 2013 and Leverage index (LVGI) in 2014, overall result M-score evaluates low motivation to manipulate earnings.

Table 4: Assessing risks of manipulation of financial statements by the M-Score

	2009/ 2008	**2010/ 2009**	**2011/ 2010**	**2012/ 2011**	**2013/ 2012**	**2014/ 2013**
M-score (8 variable model)	-2,58	-2,35	-3,4	-2,81	-14,52	-4,08
If M > -2.22, likely is a manipulator	**low risk**	**low risk**	**low risk**	**low risk**	**Low Risk**	**low risk**

Source: author

Table 4 reveals the entity´s results of the Beneish M-score between 2009 – 2014. In these years the M-scores were reported at the level of less than -2.22 and the years were assessed as low risk with an improbable earnings manipulation.

Jones Non-discretionary Accruals

The Jones´ accruals model finds risk in manipulation with the financial statements in inconsistency of non-discretionary accruals in the development between different accounting periods. The Jones model of non-discretionary accruals suggests that if non-discretionary accruals decrease, discretionary accruals increase and vice versa. If these fluctuations are significant, they can indicate the manipulation of financial statements by some accruals violation and some kind of earning management.

Jones Non discretionary Accruals are defined as follows:

$$\left(\frac{1}{\text{Total Assets}}\right)+\left(\frac{\text{Revenue}_{\text{current year}}-\text{Revenue}_{\text{prior year}}}{\text{Total assets}_{\text{current year}}}\right)+\left(\frac{\text{Property,plant, equipment, gross }_{\text{current year}}}{\text{Total assets}_{\text{prior year}}}\right)$$

(

Mantone,2013)

Table 5: Assessing the risks of manipulation of financial statements by Jones' Non discretionary Accruals

Accounting item	**2009**	**2010**	**2011**	**2012**	**2013**
Total assets	32871	3297	33158	3294	32351
Revenue	30417	28820	26549	25533	25140
Property, plant, equipment	11519	12098	11792	11121	10323
Jones ´analysis	x	-0,02958	-0,05273	-0,29576	96,44417
Result		**low risk**	**low risk**	**low risk**	**high risk**

Source: author

Table 5 shows the results of Jones´ Non-discretionary Accruals. The low risk of the manipulation of financial statements are indicated in years 2009, 2010, 2011 and 2012. The high risk of fluctuation of discretionary expenditure is identified only in year 2013. It was caused by the increase in total assets of about 29,057 mil. CZK and merger of the other business corporations.

Discussion and Conclusions

These detailed tests can be performed by a professionally qualified user of accounts who wants to decide on the development of the company's financial health, as part of the introduction of an anti-fraud program into their internal control systems based on the submitted financial statements. The group of professionally qualified users includes internal or external auditors, owners, those charged with governance (Corporate Governance) or stakeholders of public administration and control offices. Information about the risk of manipulation of financial statements may not only improve the effectiveness of internal control systems of the subject, but also reduce the information asymmetry between owners and those charged with the management of an enterprise.

In addition, the user should take into account the possibility of manipulation with various accounting items when deciding on the basis of the previously mentioned models. In our opinion, it is necessary for any user of the accounts to take this risk into account when deciding. The group of users includes internal or external auditors, the owners, banks or other institutions, and the managers of Corporate Governance and everyone whose decisions regarding the outcome of accounting is dependent on the quality of the accounting data in the financial statements.

Based on their results, it is possible to identify risk points, reverse reaction in the financial statements or accounting (if you are a user who has access to the records) and to carry out detailed tests to obtain assurance that no manipulation occurred. The CFEBT model is considered to be a basic comprehensive view of the financial statements and the links between them. The model traces the development of the statements and links for more accounting periods (optimally in five years) and analyses the links between cash flow and profit. The paper also presents a modified version of this model, which is the result of identifying risk factors that emerged from the development of discrepancies in cash flow and profit. The modified version of the CFEBT model respects the individuality of the accounts of a sample entity and substantially eliminates the diversity of national accounting systems such as the Czech accounting standards, IFRS and US GAAP.

We believe that the suggested CFEBT model may be used by auditors to identify risks of accounting fraud in accordance with ISA 240 or by any user of accounts for testing financial statements. Its modified version may be used as a detailed test for auditors to identify risk; particularly in application of the audit judgement in assessing audit risk, in audit planning and in testing different items in the financial statements. It is appropriate to complement the CFEBT model with other models of M-score for testing the motivation of financial statements manipulation and the Jones' Non-discretionary Accruals models for testing the fluctuations in accruals.

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