Possibilities of Identifying Manipulated Financial Statements

Zita Drábková1

Abstract: The paper deals with the possibilities of using different techniques and tools to identify potential risks of manipulated financial statements beyond true and fair view of accounting. Current research has verified the hypotheses of identifying the risks of financial statement manipulation in a case study of five accounting periods using the CFEBT model within the Czech Accounting Standards for different options of using creative accounting methods. Furthermore, the results CFEBT models in each case study are compared with results of the Beneish model. The model of CFEBT confirmed positive results of the Beneish model for the used technique of windows dressing in terms of the Czech Accounting Standards.

The following paper further analyzes and evaluates techniques and tools to identify risks of manipulated financial statements using the most important methods of creative accounting and accounting fraud in the CFEBT mode, the Beneish model, the Jones model of Nondiscretionary Accruals in comparison with the results of the Altman's model of financial health.

Key words: Fair and true view · Creative accounting · Fraud · Detection of financial statements manipulation

JEL Classification: M4 · M1 · G3

1 Introduction

The Financial Statements are an important source of information for users of financial statements i.e. the owners, Corporate Governance, potential investors, state, creditors, customers, suppliers and the public. They have to faithfully and honestly inform about the financial status of the entity on its performance, structure, property, resources, funding and equity capital structure.

If the entity significantly distorts the financial statements or gives false information and this disrupts a true and fair view of accounting it will be affected by legislative sanctions in accordance with the Accounting Act, but also it could be prosecuted by criminal law as the offense of misrepresentation of data on the state of management. Therefore, it is important for the users of the financial statements to have the opportunity to evaluate the risk of handling accounting and they should have the tools to evaluate this risk.

This paper should therefore extend current knowledge, information and methods in this area and offer some alternative solutions.

2 Methods

National studies from around the world such as (Amat & Blake, 2006; Brennan & McGrath, 2007) and (Jones, 2011) or Global Economic Crime Survey of the PwC major auditing company in 2014 (PwC, 2014) confirms the growing pressure in promoting transparency and ethical business, not only in publicly traded business corporations, but also in the misuse of subsidies by major business corporations and the use of accounting as evidence. In Jones’s book called Creative Accounting, Fraud and International Accounting Scandals some of the creative accounting tools are described. Those tools are able to influence overall values in the financial statements for different strategies such as increase income, decrease expenses, increase assets and decrease liabilities (Jones, 2011).

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, 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 subjected examination of via the individual tools and tech-

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1 Ing. Zita Drábková, Ph.D. University of South Bohemia in České Budějovice, Faculty of Economy, Department of Accounting and Finance, Studentská 13, České Budějovice, e-mail: drabkova@ef.jcu.cz
niques appointed to examine the accounting fraud. These case studies include the following techniques: Liquidity ratios, profitability ratios, horizontal analysis, vertical analysis, cash realized from operations, analyzing 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).

The paper uses the Jones model to test the risks of manipulated financial statements, within the results of the above case studies of creative accounting in variants A and C, designed by Dr. Jennifer Jones. The model is based on measurement of discretionary spending of the next periods. She is convinced that discretionary accruals provide more space for manipulation compared to non-discretionary accruals as they are equal to zero within the period. Discretionary accruals can be classified as expenditure which although recorded in books are not mandatory, as the resulting costs to the remuneration of management, warranty reserves and asset provisions for bad assets. As a part of her research, Jones studied the influence of management on reducing income (Manton, 2013).

Previous research verified the hypothesis of a relation 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 designed and tested to identify possible risks of manipulated financial statements in case studies of creative accounting for the conditions of Czech Accounting Standards (Drábková, 2013).

Furthermore, data from the case studies already published in the Beneish Model were assessed and verified for the conditions of the Czech accounting Standards. The Beneish M score was created for financial conditions by Professor Daniel Beneish Messod at Indiana University in Bloomington, USA (Beneish, 2001).

The paper analyzes and evaluates the techniques and tools to identify risks of manipulated financial statements using the main methods of creative accounting and accounting fraud in the CFEBT model, Beneish model, the Jones model of non-discretionary accruals in comparison with the results of Altman's model of financial health. The analysis is based on a case study of an entity in five accounting period for option A (presents selected key techniques of creative accounting, windows dressing and accounting fraud) and option C (accounting presents maximization of displaying a true and fair view in accounting), for further details see the case study in (Drábková, 2013).

3 Research results

For the purpose of verifying the identification model CFEBT a case study was designed for the business entity (whole-sale) in options "A" and "C". The entity model "A" at the same conditions applied the techniques of creative accounting (windows dressing) to monitor turnover and maximize asset value. Option “C” monitors in compliance with the goal of true and fair view as much as possible.

3.1 The Beneish M-Score Model

Beneish Model is a mathematical model used for financial models. It contains eight variables that can detect manipulation of accounting data. This was based on statements, calculating the M score. M-score was created by Professor Beneish-Messod. In many respects, it resembles the Altman Z score, but is optimized for the detection of profit manipulation more than bankruptcy.

M-score calculation (8-variable model):

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

The following variables are employed:
1. DSRI - Days' sales in receivable index in the t and t-1 period.
2. GMI - Gross margin index as the ratio of gross margin and sales in the t and t-1.
3. AQI - Asset quality index.
4. SGI - Sales growth index.
5. DEPI - Depreciation index.
6. SGAI - Sales and general and administrative expenses index.
7. LVGI - Leverage index of total debts to total assets in the t and t-1.
8. TATA - Total accruals to total assets in the t-period.

M-score of less than -2.22 indicates that a company do not manipulate the financial statements in the accounting period. M-score greater than -2.22 signals that the company will likely be a manipulator.

Beneish Model represents a different perspective on the manipulation of accounting data. When an entity reaches the M-score higher than -2.22, calculated from the above eight variables, the model assumes that it is probable that the entity has manipulated accounting data for the accounting period or is strongly motivated to manipulate accounting data (Beneish, 2001).

**Table 1** Beneish M-Score Model in the 1st and 2nd year

<table>
<thead>
<tr>
<th>Options for 1st - 2nd year</th>
<th>M-Score</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td>-0.83</td>
<td>High risk in 1st year</td>
</tr>
<tr>
<td>Option C</td>
<td>-2.26</td>
<td>Low risk in 1st year</td>
</tr>
</tbody>
</table>

Source: author

Table 1 revealed that option A’s value of the Beneish M-Score amounted to -0.83 thus was higher than -2.2, which is set by to model to the risk assessment. M-Score for A option and year 1 (accounting period) thus positively detects high risk of manipulation of financial statements. In contrast, C variant and 1.y of Beneish model reported low risk of manipulation of financial statements. The M-score of -2.26 is less than the threshold value of -2.2. The M-Score positively detects methods of the creative accounting (windows dressing and fraud) that distort the true and fair view of accounting in option A case study.

3.2 The CFEBT model

The **CFEBT** model is defined as follows (Drabkova, 2013):

\[
CFEBT = \sum_{t=1}^{5} \left( \frac{CF_t - VH_t}{VH_t} \right)
\]

If \(CFEBT \geq \text{materiality}\), there is a high risk of breaching a true and fair view of the accounts.

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% is considered in this paper.

**Table 2** CFEBT model in the 1st - 5th year

<table>
<thead>
<tr>
<th>Options for 1st - 2nd year</th>
<th>Materiality</th>
<th>Result of risk manipulated financial statements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td>37.5%</td>
<td>high risk</td>
</tr>
<tr>
<td>Option C</td>
<td>2.5%</td>
<td>low risk</td>
</tr>
</tbody>
</table>

Source: author

The CFEBT model follows five financial years of the development of increase (decrease) in cash flow and profit development, which results from the accrual basis of accounting. According to the above table, the result of the CFEBT model for A option reported a deviation value at the time high above the levels of significance (materiality) of 37.5%. In this option the model detected a high risk of manipulation of financial statements and recommends analyzing the differences in risk items of the statements. In comparison with the result of C option, the results of the CFEBT model showed the value of 2.5% that is not considered significant in relation to risk of accounting fraud detection.

3.3 Jones Nondiscretionary Accruals

The formula of total Nondiscretionary Accruals is as follows (Mantone, 2013):

Jones’s analysis provide information on using time resolution as considered by an accounting unit. Using the model allows users to assess of accounting information in the financial records has been possibly manipulated. If the non-discretionary accruals compared to total assets are lower in a period with a comparison to other periods than the model reveals that discretionary expenditures of the following periods are higher. Such situation may suggest possible manipulation.

\[
\left( \frac{1}{TA} \right) + \left( \frac{\text{Revenue}_{\text{current year}} - \text{Revenue}_{\text{prior year}}}{\text{Total asset}_{\text{current year}}} \right) + \left( \frac{\text{Property,plant, equipment}_{\text{current year}}}{\text{Total asset}_{\text{prior year}}} \right)
\]

(3)
This model calculates nondiscretionary accruals and suggests that as nondiscretionary accruals decrease, discretionary accruals increase. Sloan’s Accruals analyzes if the accruals significantly influence net income for the same year.

Table 3 Jones Non-discretionary Accruals, option A

<table>
<thead>
<tr>
<th>Accounting item</th>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
<th>4th year</th>
<th>5th year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>65005</td>
<td>118105</td>
<td>53244</td>
<td>77619</td>
<td>31713</td>
</tr>
<tr>
<td>Revenue</td>
<td>79500</td>
<td>80605</td>
<td>7740</td>
<td>39875</td>
<td>40094</td>
</tr>
<tr>
<td>Property, plant, equipment</td>
<td>11100</td>
<td>12100</td>
<td>12100</td>
<td>13600</td>
<td>13600</td>
</tr>
<tr>
<td>Jones Accruals</td>
<td>0.195510993</td>
<td>-1.26605133</td>
<td>0.66945608</td>
<td>0.1821334</td>
<td></td>
</tr>
<tr>
<td>Result</td>
<td>x</td>
<td>x</td>
<td>high risk</td>
<td>high risk</td>
<td>high risk</td>
</tr>
</tbody>
</table>

Source: Own processing

Table 4 Jones Non-discretionary Accruals, option C

<table>
<thead>
<tr>
<th>Accounting item</th>
<th>1st year</th>
<th>2nd year</th>
<th>3rd year</th>
<th>4th year</th>
<th>5th year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>15655</td>
<td>19505</td>
<td>26394</td>
<td>25019</td>
<td>26673</td>
</tr>
<tr>
<td>Revenue</td>
<td>31250</td>
<td>31355</td>
<td>31490</td>
<td>15125</td>
<td>16094</td>
</tr>
<tr>
<td>Property, plant, equipment</td>
<td>10000</td>
<td>11000</td>
<td>11000</td>
<td>11000</td>
<td>11000</td>
</tr>
<tr>
<td>Jones Accruals</td>
<td>0.708098023</td>
<td>0.569124027</td>
<td>-0.23730361</td>
<td>0.476034695</td>
<td></td>
</tr>
<tr>
<td>Result</td>
<td>x</td>
<td>x</td>
<td>low risk</td>
<td>high risk</td>
<td>low risk</td>
</tr>
</tbody>
</table>

Source: Author

Tables 3 and 4 revealed the stability of non-discretionary items between accounting periods for both A and C options. Option A reported fluctuation of non-discretionary accruals from the second to the fifth year of the period. In the third year, the non-discretionary items decreased significantly which was followed by a significant increase in discretionary items in the following fourth year. In such case, the model detects a possible manipulation with profit during each accounting period.

Option C reported quite invariable values of non-discretionary items in the second, third and fifth year (accounting period) together with a significant decrease of non-discretionary items in the fourth year. The decrease can indicate earning manipulation, possibly the method of income smoothing or accounting fraud.

As the Czech accounting standards within cost and revenues do not strictly record the principle of the content taking precedence over the form, this information can be seen as complementary in terms of Czech accounting standards particularly for understanding underlying accounting data and processes of management accounting by the managers of Corporate Governance in the extended concept to refine the calculation of deferred taxes based on the economic substance of financial data.

3.4 Altman Z-Score Model

Professor E.I. Altman designed a model in 1968. The aim of the model is to determine business subjects that are likely to bankrupt from those that are out of such risk. For non-marketable businesses the following modification of the Altman model could be employed (Bláha & Jindřichovská, 2013):

\[
Z\text{-score} = 0.717 \times x1 + 0.847 \times x2 + 3.107 \times x3 + 0.420 \times x4 + 0.998 \times x5 \tag{4}
\]

where:
- \(x1\) = Net working capital / total assets
- \(x2\) = retained earnings / total assets
- \(x3\) = EBIT / total assets
- \(x4\) = capital / total debts
- \(x5\) = sales / total assets

Retained earnings = funds created from profit + profit / loss of previous periods + profit/loss of the current accounting period.

The following applies for the resulting Z-score: if it is larger than 2.90 the business is financially firm or stable – it predicts a good financial situation, if the score is from 1.2 to 2.9 it is the grey zone, when the value of Z-score is less than 1.2 a business is at risk of bankruptcy in the future.
Table 5 Altman Z-Score Model, option A in the 1st - 5th year

<table>
<thead>
<tr>
<th>Accounting periods</th>
<th>Z-Score</th>
<th>Financial health assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>1.7</td>
<td>Grey zone</td>
</tr>
<tr>
<td>2nd year</td>
<td>1.4</td>
<td>Grey zone</td>
</tr>
<tr>
<td>3rd year</td>
<td>1.2</td>
<td>Grey zone</td>
</tr>
<tr>
<td>4th year</td>
<td>1.0</td>
<td>at risk of bankruptcy</td>
</tr>
<tr>
<td>5th year</td>
<td>&gt;2.9</td>
<td>good financial situation</td>
</tr>
</tbody>
</table>

Source: Author

Table 5 for option A s using the method of windows dressing and fraud reported the financial health of the grey zone in year 1, 2 and 3.

In the 4th year, the Z-Score reported bankruptcy risk, followed by a good financial situation in the very next of the accounting period according to the resulting Z-score of > 2.9. Here Altman’s model does not provide users of financial statements with a useful tool for determining the relevant financial health. For the purposes of risk assessment of manipulated financial statements it can be identified significant risk of manipulation with the financial statements in each year.

Table 6 Altman Z-Score Model, option C in the 1st - 5th year

<table>
<thead>
<tr>
<th>Accounting periods</th>
<th>Z-Score</th>
<th>Financial health assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>2.9</td>
<td>Grey Zone</td>
</tr>
<tr>
<td>2nd year</td>
<td>3.2</td>
<td>good financial situation</td>
</tr>
<tr>
<td>3rd year</td>
<td>2.9</td>
<td>Grey Zone</td>
</tr>
<tr>
<td>4th year</td>
<td>&gt;2.9</td>
<td>good financial situation</td>
</tr>
<tr>
<td>5th year</td>
<td>&gt;2.9</td>
<td>good financial situation</td>
</tr>
</tbody>
</table>

Source: Author

Table 6 revealed that the Altman Z-Score for option C recorded business corporations in the grey zone in the 1st and 3rd year of evaluation while for these two years the value of the Z-Score amounted the threshold of 2.9, as the Z-score above the threshold indicates good financial health of a business corporation. In subsequent years (the 2nd, 4th and 5th year), the Z-Score reported financial health above the threshold of 2.9.

The positive outcome of the assessment of financial health is significantly affected by the proposed business corporation that is not burdened by obligations that would threaten the business activity of the corporation.

For the purposes of risk assessment manipulation of financial statements in individual years the results of the Z-Score for each accounting period can used. Stable and positive results of the Z-Score indirectly confirm the results of other models detecting manipulated financial statements. At a general level, the question is whether the stability of the results of this model is to some extent caused by the manipulation of accounting items of assets, liabilities, income, on which the model is based.

4 Conclusions

A true and fair view of the different accounting systems is not comparable data for the users of financial statements but within the national accounting system financial statements of the entity in the comparison of different accounting periods should provide the user with comparable data and information that most closely reflects the economic substance of the individual processes of the entity recognized under the rules of the legislative instruments of the accounting system. This becomes important not only due to the fact that accounting is always reflected to some extent as subjective estimates and the inadequacy of the financial statements of the accounting system.

The paper extends existing knowledge, information and detection methods of manipulated financial statements, in case of significant disruption of a true and fair view within the application of the methods of creative accounting of windows dressing and fraud. The results of case studies of five accounting periods for the entity are analyzed in variants A and C pursuing different objectives and these are subsequently reflected in the financial statements of each ac-
counting period and in terms of Czech accounting standards. To verify the detection of manipulated financial statements the Beneish M-Score Model, the Model of the CFEBT analysis and the model of Jones Nondiscretionary Accrual were chosen in comparison with the Altman model of Z-Score developed to assess the financial health of the business entity. The results of selected models are compared and the results are assessed.

We believe that this paper may be used by users of the financial statements or auditors for testing financial statements as a detailed test on the basis of which a risk of an accounting fraud may be identified, and moreover, it may be applied by all users of financial statements who are to consider the issue of reliability of financial statements submitted to them.

References