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Article

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Scientific Papers of the University of Pardubice, Series D: Faculty of Economics and Administration

Provided in Cooperation with:

Faculty of Economics and Administration, University of Pardubice

Suggested Citation: Hýblová, Eva; Kolčavová, Alena; Urbánek, Tomáš; Petráková, Zora (2022) : Can information from publicly available sources reveal manipulation of financial statements?, Scientific Papers of the University of Pardubice, Series D: Faculty of Economics and Administration, ISSN 1804-8048, University of Pardubice, Pardubice, Vol. 30, Iss. 3, pp. 1-9, <https://doi.org/10.46585/sp30031556>

This Version is available at:

<https://hdl.handle.net/10419/334792>

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Can Information from Publicly Available Sources Reveal Manipulation of Financial Statements? Case Study of Czech and Slovak Companies

Scientific Papers of the University of Pardubice, Series D: Faculty of Economics and Administration 2022, 30(3).

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DOI: 10.46585/sp30031556
editorial.upce.cz/SciPap

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Abstract

Financial reporting is a source of information used as a basis for economic decisions. It is essential for the calculation of financial indicators that serve to evaluate the financial health of a company. Statements that are accurate and provide trustworthy information are a prerequisite for an enhancement of company competitiveness on national and global markets. Research into and studies on the accuracy of the information contained in statements show that statement creators use manipulation to improve accounting entities' image. The aim of this paper is to verify whether ordinary users of financial statements can rely on the veracity of the information contained in the financial statements published in the usual way in available sources. The research subject was financial statements of entities listed in the TOP Czech and TOP Slovak ranking within the revenue category. We investigated whether reporting show an indication of accounting data manipulation using the CFEBT (cash flow earning before tax) method and a method aimed at verifying the linear dependence between earning before tax (EBT) and cash flow (CF). The empirical results yielded interesting findings. They showed that the disputable item is the results of accounting estimates, which are often influenced by subjective decisions made by the financial statements creators.

Keywords

Accounting; Financial reporting; Creative accounting; Model comparison, CFEBT

JEL Classification

M40, M41

Introduction

The objective of general-purpose financial reporting is to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions relating to providing resources to the entity. These decisions involve decisions about: a) buying, selling or holding equity and debt instruments; b) providing or settling loans and other forms of credit; c) exercising rights to vote on, or otherwise influence, management's actions that affect the use of the entity's economic resources (IFRS, 2019).

All internationally used accounting concepts, International Financial Reporting Standards (IFRS) and Generally Accepted Accounting Principles (US GAAP), as well as national legislations of EU Member States based on Directive 2013/34/EU of the European Parliament and of the Council of 26 June 2013 on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings, agree on this objective.

Financial health of a company is assessed based on the information contained in financial statements. The financial health is one of the best indicators of a company's potential for long-term growth and success in the competitive market environment. Measuring and evaluating financial ratios between profit rate, activity, liquidity, and debt ratio

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help create a competitive advantage for a company (Kliestik et al., 2020). Financial indicators are traditional indicators of an entity's general performance (Rahman et al., 2017; Štefko et al., 2020) and help quantify a potential impact of internal ratings on the financial performance (Belas et al., 2012; Onuferová et al., 2020; Čabinová et al., 2021).

If users are to make the right choice, the information contained in financial statements must be disclosed in accordance with the fair and true view principle. All financial reporting concepts define the principle in a similar way, as a compliance with general principles and qualitative characteristics. If an entity does not correctly state the information in the statements, the users make decisions based on erroneous information. In this respect, Škoda et al. (2017) stated that it may be difficult or even impossible for stakeholders to discern the effects of manipulation with statements, which is a motivation for this study. Therefore, we are faced with the following research question: "Are average users able to verify the accuracy of financial statements from publicly available sources?"

The issue of manipulation with statements available from public sources is only devoted a minor attention. The authors' attitude in the empirical part of the research is unique as it allows distinguishing whether the statements available from public sources have been manipulated, based on data gained from financial statements of selected companies from the Czech and Slovak enterprise environments. For this purpose, the mathematical and statistical tool, CFEFT method, was applied. At the same time, the linear dependence between EBT and CF was verified.

The paper has the following structure. In the Introduction, the authors present the investigation of this research issue in global literature; formulate the research question; and define the research gap. The Theoretical background contains a detailed survey of this financial reporting issue. This chapter also presents a critical survey of literature and case studies that deal with the accuracy of financial statements. The following part presents the main aim of the paper, the research methodology and the selected statistical methods for hypotheses assessment. The next part provides the empirical results of the research step by step. The Discussion summarises the most important empirical results, analysing and comparing them with the results of studies on the issue by foreign authors. The Conclusion repeats the main aim of the paper; provides an exact evaluation of the research question; indicates a future direction of the authors' research activities; defines the limitations of the case study as well as the reader community for whom the findings might be of interest.

Theoretical background

The first step in verifying the quality of statements is the auditor's opinion; however, even in this case, International Standards of Auditing, ISA 240, The Auditor's Responsibilities Relating to Fraud in an Audit of Financial Statements, and ISA 200, Overall Objectives of the Independent Auditor and the Conduct of an Audit in Accordance with International Standards on Auditing, state that although the auditor may identify opportunities to commit fraud, it is difficult to determine whether errors within the scope of judgment, such as accounting estimates, were caused by fraud or error. Given the natural limitations of the audit, there is an unavoidable risk that some significant (material) errors in the financial statements may go undetected, even if the audit is properly planned and carried out in accordance with auditing standards.

There is some flexibility in the understanding of items in each financial reporting regulatory framework. Drawing up a financial statement often demands a judgement. The judgement is what can lead to incorrect conclusion with the given flexibility of financial reporting, which gives entities some freedom when compiling financial statements (Weil et al., 2006; Halaskova et al., 2021). In some cases, the accounting rules can be "used" to improve the financial results of an entity and their rewarding (Pope et al., 2000, Bushee, 2001).

It is therefore the person drawing up the statement that remains within the permissible boundaries or deliberately crosses the boundaries and distorts the value of the statements (Craja et al., 2020; Jones, 2010). In this context, the concept of creative accounting arises, although there are different approaches to its definition, none of them being generally accepted (Abed et al., 2022). Authors defining creative accounting usually distinguish between manipulating the value of items based on gaps in accounting regulations that may not be targeted, and fraud that is supposed to provide a more favourable picture of an entity (e.g. Ustinova, 2022; Oyedokun, 2018; Jones, 2010). Dasí-González et al. (2018) stated that creative accounting is a process in which accounting professionals use their knowledge to manipulate the information contained in annual financial statements. Creative accounting reflects the pressure formed by managers who want to make an impression of higher profits and assets to attract investors, gain tax incentives, strengthen the market value of shares, etc. Zuca & Corina (2012) and Wokukwu (2015) defined creative elements as the flexibility of international accounting regulations. Creative accounting appears in various types of accounting entities. Vela-Bargues et al. (2022) investigated the relationship between creative practices and reporting of financial performance of entities in public administration in Spain. Abdurrahmani & Doğan (2021) estimated how creative accounting operations affect the future governmental expenditures and revenues and thus the future financial performance in Kosovo. A similar study was conducted by Ali et al. (2020) in Malaysia. Akpanuko & Umoren (2018) or Darmansyah & Hamidah (2017) evaluated the effect of creative accounting on the procedures concerning financial performance of companies listed on an exchange, finding that creative procedures affect the financial performance significantly and some entities misused them.

In literature, there are a number of methods that authors have developed to detect the manipulation of statements (Dechow and Dichev, 2002; Darjezi, 2016; Yang, 2021). Dechow and Dichev (2002) presented an accrual-based model, which was later modified by Shi and Zhou (2013). Sloan (1996) created a model based on the relationship of stock prices, CF and future earnings. Jones (1991) compiled a model based on the timeliness of discretionary accruals. Kouřilová et al. (2018) provided an AHP multi-criteria model, determining possible disproportions in statements based on weighting individual criteria. The drawbacks of the above-mentioned models are the subjective determination of some items or criteria significant for result evaluation, as well as the need to analyse in-house information, which may face the management reluctance or distortion of the information provided. Maniatis (2021) used the Beneish model (M-score), which consists of eight variables to examine the probability of financial statement fraud related to earnings manipulation for 40 companies listed in the Athens Stock Exchange Market.

Incorrect item reporting has always been present in financial statements, caused by errors, adjustments within the regulatory framework, or deliberate frauds. Research conducted by auditing company Ernst & Young (2012) showed that misrepresentation in financial statements is still a significant issue and that many users underestimate these risks and do not verify new companies.

The main areas adjusted in the financial statements include overvaluation of assets and revenues, undervaluation of liabilities and expenses, non-use of allowances and provisions, and non-compliance with the accrual's principle (Jones 2011). This results in erroneous values of assets, equity, liabilities, and profit or loss. Profit or loss, namely earning before tax (EBT) and cash flow (CF), are important items users of financial statements focus on. There is a close relationship between these items: making a profit generates CF (Li et al., 2022). CF amounts are rarely equal to revenues, and each of the items is affected by other factors: e.g. the maturity of receivables and liabilities affects CF; depreciation, impairment of assets, and provision formation affect revenues. However, if there is a significant difference between them permanently, this may indicate either problems in business or a likelihood of financial statement manipulation.

Research objective, methodology, methods, and data

The main objective of this research is to verify the ways to detect financial statement manipulation from the perspective of an ordinary user, using a selected sample of entities.

The following steps lead to the objective achievement: use an available method to verify the possible ways of manipulating financial statements; develop a new methodology to identify companies potentially misrepresenting financial statements; test the methodology using the obtained dataset; examine the statements of companies suspected of manipulating financial statements.

In order to fulfil the research objectives, we apply two methods: the existing CFEBT method, as mentioned by Drábková (2018); and a method based on the verification of a linear dependence between EBT and CF. Financial statements of Czech companies ranked as the Czech TOP 100 (Czech TOP, 2020), and Slovak TOP 100 (FINSTAT, 2020) in the revenue category for 2019 served as a source of quantitative data. The data came from publicly available sources. The dataset contains data for 2015–2019. A total of four variables are available: Company ID; Year; Cash flow (CF); Earning before tax (EBT).

We summarised the data and checked for extreme and missing values. Out of the primary dataset of 400 financial statements (5 years; time period: 2015-2019), we selected 80 accounting entities for the following analysis. Inclusion in the file required the availability of financial statements for all reference periods. All entities analysed provided financial statements verified by audits. The financial statements analysed had been prepared in compliance with the IFRS (55%) or national regulations based on Directive 2013/34/EU of the European Parliament and of the Council on the annual financial statements, consolidated financial statements and related reports of certain types of undertakings (45%). These are entities classified as medium and large companies in accordance with national legislations, based on balance sheet total, net turnover, and average number of employees. The structure of companies (n=80) according to the business sector is the following: energy (12%), industrial production (50%), trade and services (23%), and others (15%).

Statistical methods. The first step was to apply descriptive statistics. Descriptive statistics (e.g. mean, standard deviation, minimum, median, maximum, range) were used in the evaluation of financial variables (CF, EBT). Subsequently, in the second step was applied the CFEBT method. The CFEBT method is based on a hypothesis about the relationship between the EBT and CF developments, which may be disrupted by non-standard techniques leading to increased assets and revenues, or reduced liabilities and expenses, or increased operating CF (Drábková, 2018). There are three stages of detecting the risk of financial statement manipulation: CFEBT at the materiality level; the detection of creative manipulation techniques at the process level. CFEBT testing at the materiality level is expressed as:

$$CFEBT = \left(\frac{\sum_{t=1}^5 CF_t - \sum_{t=1}^5 EBT_t}{\sum_{t=1}^5 EBT_t} \right) \cdot 100 \quad (1)$$

Materiality should range within 5–10%, considering the individual circumstances and risks of the accounting entity. In the case of a different value, it is necessary to analyse significant fluctuations in individual accounting items, e.g. large-scale investments that significantly change CF, accruals, application of the precautionary principle.

In the third step, the graphical visualization of the ideal linear function between EBT and CF was used. The basic assumption of the proposed methodology is the hypothesis that if an entity has the potential to generate economic benefits, this must be reflected in ideal linear function between CF and EBT, i.e., EBT must increase with an increasing CF (and vice versa). The methodology is based on the linear function between CF and EBT. The linear function is represented by function $y = x$, in our case $CF = EBT$. Therefore, we have a sample of five-year data, variables EBT and CF. We plot these points in the graph and determine their orthogonal distance d from the ideal line $CF = EBT$.

$$d = \frac{EBT - CF}{\sqrt{2}} \quad (2)$$

Then we standardise the individual distances using z-score. From this, we can determine which companies deviate from this line by more than 1.96 standard deviations, allowing us to identify those for which the distance is greater than that of 95% of the companies in the dataset. We identified the companies with a distance above 95% as entities that could potentially manipulate financial statements. We performed this procedure for the individual years. Companies marked more than once are then selected for a thorough analysis of statements. We used statistical software R, version 3.6.1, for all statistical calculations.

Results and discussion

Table 1 contains the basic statistical evaluation of CF and EBT in 400 financial statements during years 2015-2019.

Table 1. Descriptive statistics of analysed data.

Variables	Descriptive characteristics						
	N	Mean	SD	Median	Min.	Max.	Range
CF	400	152.75	3262.84	4.5	-42099	32566	74665
EBT	400	1257.43	4226.39	198.5	-5317	39125	44442

Note: N is the total number of financial statements; Mean is the value of the average; SD is the standard deviation of the data; Median is the median value; Min is the smallest value in the dataset; Max is the highest value in the dataset; Range denotes the variation range (i.e., max–min). **Source:** own data collection.

Table 1 highlights the mean of the individual variables, CF and EBT, as CF is approximately 8 times lower than EBT. However, the median values are very important, indicating a significantly oblique distribution of values, i.e., a high probability of extreme values occurring.

CFEBT results

The financial statements data were tested using the CFEBT method, which monitors CF and EBT dependence cumulatively for five consecutive financial years using formula (1). The materiality should be between 5% and 10%. None of the companies for which CFEBT was calculated fell within the required interval. Since we had obtained the data analysed from financial statements publicly available, it was not possible to carry out an analysis at other related levels.

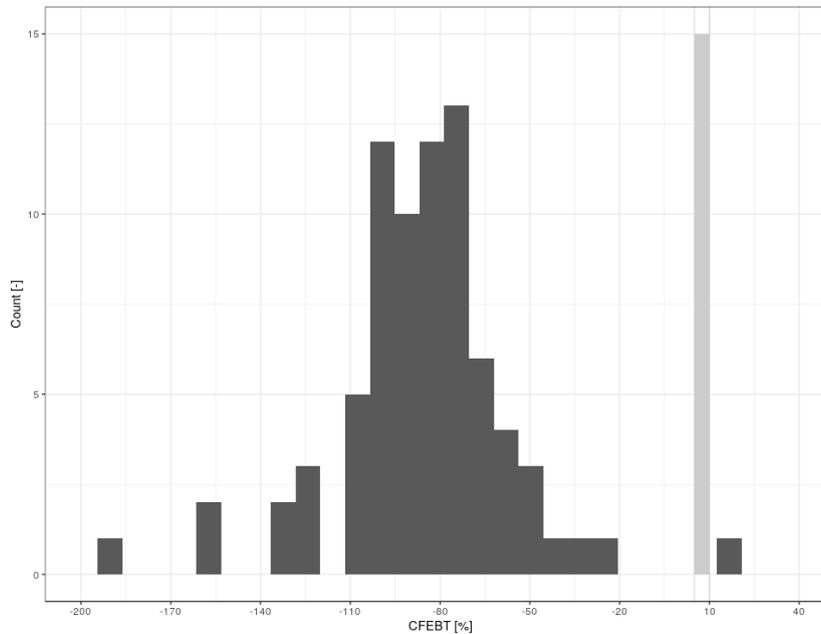


Fig. 1. The histogram of CFEBT calculated for all companies examined. Source: own data collection.

The graph depicts the histogram of each calculated CFEBT. The light grey part displays the recommended materiality, in the $<5\%; 10\%$ interval. These results show that only one company with a materiality of 16% came close to the recommended values. We performed a subsequent analysis of the financial statements, including additional information in the notes to the financial statements. Even after editing from the available data, the results did not significantly approach the recommended values. The results were distorted by the limitations resulting from the published information; in particular, accounting estimates affecting the value of EBT cannot be accurately verified.

Ideal linear function between EBT and CF

The following figure 2 describes the results of the statistical analysis and the methodology presented based on the linear function between EBT and CF to identify companies suspected of manipulating financial statements.

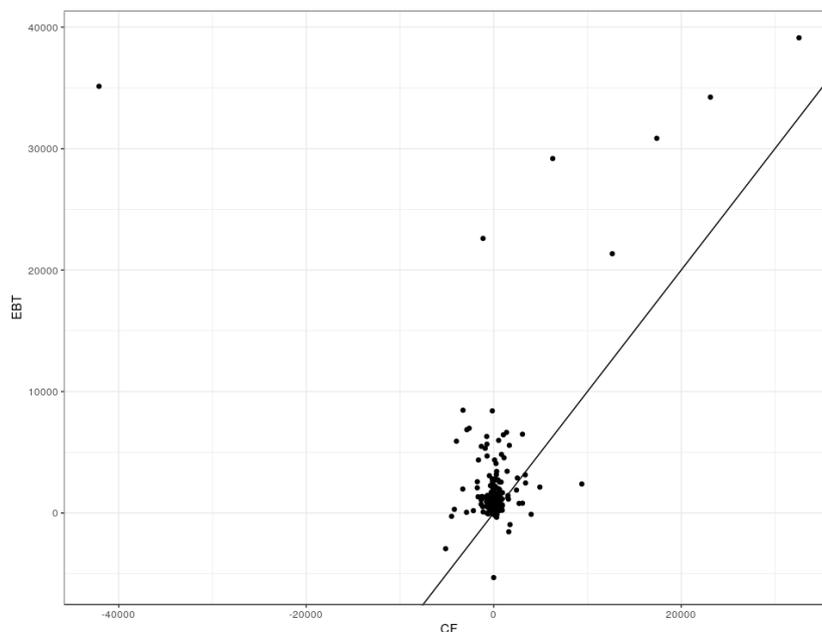


Fig. 1. CF and EBT dependence in individual companies. Source: own data collection.

Figure 2 depicts the position of the companies examined, relative to the ideal position given by the $CF=EBT$ curve. Most companies are within the permitted range. Those that move significantly away from the curve are suspected of manipulating their statements and are further analysed.

The orthogonal distances of all companies were subjected to standardization using z-score, as shown in Figure 3.

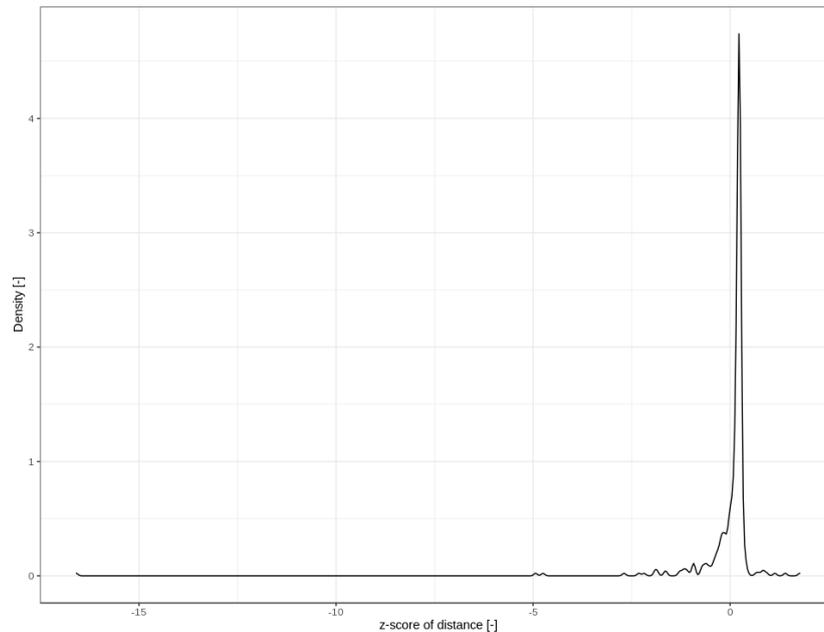


Fig. 3. Z-score density of calculated distances for every year. Source: own data collection.

Figure 3 shows the density of distances of each calculated z-score. The most interesting is that most values lie near zero, thus not showing extreme distance from the linear dependence $CF=EBT$. The graph also shows several extreme values, whose z-scores are -17 and -5. These companies achieve the largest differences between CF and EBT compared to the others, and can be potentially identified as suspected of manipulating the statements. Table 2 shows the differences between CF and EBT, the companies are marked A–H.

Table 2. Differences between CF and EBT for A–H companies suspected of manipulating the statements.

Year	2015	2016	2017	2018	2019
Company	z-score	z-score	z-score	z-score	z-score
(A)	-3.84	-3.22	-5.21	-3.44	-8.28
(B)	-4.34	-6.97	-4.50	X	-2.39
(C)	-2.64	-2.82	X	-3.59	x
(D)	-3.77	X	3.26	-2.67	x
(E)	x	X	2.06	X	x
(F)	x	X	X	-2.75	x
(G)	x	X	X	-3.10	x
(H)	x	X	X	-2.08	x

Note: x – results of z-score are acceptable. **Source:** own data collection.

Table 2 shows that there are eight companies whose data significantly deviate from normal values in each year. These are differences between a negative CF and a relatively high positive EBT, significant changes in CF versus EBT, and others. Some of the companies, namely A, B, C, and D, appear repeatedly in individual years. The financial statements of these companies were subjected to a more detailed analysis.

These are companies classified as large companies and they create their financial statements in compliance with the IFRS. Table 3 presents an overview of the basic characteristics obtained from the notes to financial statements.

Table 3 shows that the entities have fulfilled all formal obligations related to the preparation of financial statements in compliance with the legislation. All of them mention a significant impact of the adoption of new standards (in particular IFRS 15 Revenue, IFRS 16 Leases, and IFRS 9 Financial instruments) on EBT. All entities apply the precautionary principle, perform the test of impairment of assets in compliance with IAS 36 Impairment of Assets. The disputable point in this section may be the determination of estimates and assumptions relating to the future, even if they are based on historical experience and are regularly evaluated.

Zuca & Corina (2012) as well as Wokukwu (2015) defined creative elements as the flexibility of international

accounting regulations. In the case of complex estimates based on a large number of variables, the result is always influenced by a number of subjective management decisions (IAS 8 Accounting Policies, Changes in Accounting Estimates and Errors). Subjective decisions, despite being based on quality information and a comprehensive assessment of the situation, may not always be entirely relevant, so many of the estimates may not correspond to actual results.

Table 3. Overview of the basic characteristics of companies A–D.

Company	Auditor's opinion 'without reservations'	Notes to the financial statement in compliance with IFRS	Effect of new standard adoption	Precautionary principle Adjustment of the valuation of the items concerned	Risk Management
A	√	√	√	√	√
B	√	√	√	√	√
C	√	√	√	√	√
D	√	√	√	√	√

Source: own data collection.

As Škoda et al. (2017) stated, it may be difficult or even impossible for stakeholders to discern the effects of manipulation with statements. All methods used to detect possible manipulation have certain limitations, mainly the subjectivity in determining the significance or weight of individual variables. Rapley et al. (2021) and Chu et al. (2019) added that the entities where manipulation with financial statements had been proven face distrust of investors to invest their capital in them. Black et al. (2021) findings are consistent with auditors and analysts playing a key informational role in ending fraud, while managerial effort to conceal misconduct significantly extends its duration.

Conclusion

The aim of the research was to verify whether accounting information users can reveal a manipulation with financial reports available from public sources.

All methods used to detect possible manipulation have certain limitations, mainly the subjectivity in determining the significance or weight of individual variables. Even the International Standards of Auditing state that due to the natural limitations of auditing, there is a risk that some significant (material) inaccuracies in financial statements may go undetected. Another problem is the flexibility in understanding some items within each regulatory framework; its use depends entirely on those preparing financial statements.

The authors have focused on the use of the linear dependence between EBT and CF variables to reveal manipulation with accounting. This dependence forms a straight line that serves as the ideal relationship between EBT and CF. In addition, orthogonal distances d of all companies examined from this ideal line are created. Then the individual distances are standardised using z-score. The companies that achieve the largest differences between CF and EBT compared to the others can be suspected of manipulating the statements. Then a more detailed analysis of the statements of these companies was performed. The results showed that most of the companies tested (90%) manifested no signs of manipulating the statements. Exact assessment of research question: Based on the more detailed analysis of the statements of the companies where the likelihood of manipulation appears, the authors concluded that manipulation cannot be confirmed from publicly available information. The only disputable point may be accounting estimates. In the notes to financial statements, all of these companies stated that the estimates were determined based on all available information in compliance with IAS 8 Accounting Policies, Changes in Accounting Estimates and Errors, they are regularly reviewed and refined. However, in the case of complex transactions, estimates may be distorted by the subjective view of those creating financial statements. This fact can be considered the most significant in relation to EBT; however, it cannot be verified using publicly available information only.

The findings of the study have some limitations. The conclusions of the case study have been drawn from a sample of 80 accounting entities from the enterprise environments of two Central European countries with very narrow economic relations and specific criteria.

The future step of the authors' research activities will be a verification of the findings using a wider sample of financial statements, not only of entities from the TOP100 category. Additionally, the study will be conducted in the other countries of Visegrad Four (Hungary and Poland) - the initial cooperation with researchers dealing with this issue in these countries has been launched.

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