

(In)efficiency of Beneish M-score model in detecting fraud in financial statements

(Ne)efikasnost Beneish-ovog M-score modela u otkrivanju prevara u finansijskim izveštajima

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Abstract

The creation and application of accounting standards (International Accounting Standards (IAS), International Financial Reporting Standards (IFRS), American Generally Accepted Accounting Principles (GAAP)) that would have universal acceptability was the guiding idea of the most important accounting authorities when they started the process of defining and adopting accounting rules and procedures (standards), which we could call international professional accounting regulation. However, a certain "rigidity" that became immanent in the aforementioned standards was somewhat "depreciated" by prescribing at least two, and often more, permitted procedures, which put accountants in a position where their subjective preference for a certain procedure can, to a greater or lesser extent, influence the height of the periodic result. In this way, the so-called creative accounting, which with its techniques or methods helps managers, (co)owners, and/or accountants in compiling financial reports that are usually prepared in accordance with legal and professional regulations, but contrary to its spirit, results in an asset-financial and profitable position of a business (accounting entity) that deviates to a greater or lesser extent from what could be characterized as true and fair. Checking the "freedom" in the choice of adequate accounting rules and procedures, i.e., checking the correctness and objectivity of the compiled set of financial reports can be done by applying several methods and techniques developed by forensic accountants, as well as experts from other fields. In the continuation of this article, we will try to explain in more detail the essence of Beneish's M-score model for detecting possible inconsistencies in the asset-financial and yield position of the observed accounting entity, the results that confirm its (in)efficiency, as well as the doubts that still exist and that can raise doubts about the (all) possibility of this model in detecting fraud in financial statements.

Keywords: Beneish's M-score model, creative accounting, alternative accounting procedures, forensic accounting, frauds, international accounting regulation

Sažetak

Izrada i primena računovodstvenih standarda (Međunarodni računovodstveni standardi (MRS), Međunarodni standardi finansijskog izveštavanja (MSFI), američki opšteprihvaćeni računovodstveni principi (GAAP)) koji bi imali univerzalnu prihvatljivost bila je ideja vodilja najznačajnijih računovodstvenih autoriteta kada su započinjali proces definisanja i usvajanja računovodstvenih pravila i postupaka (standarda), koje bismo jednim izrazom mogli nazvati međunarodna profesionalna računovodstvena regulativa. Međutim, određena „krutost“ koje je postala imanentna navedenim standardima donekle je „amortizovana“ propisivanjem bar dva, a često i više dozvoljenih postupaka, čime su računovođe stavljene u poziciju da njihovo subjektivno opredeljivanje za određeni postupak može u manjoj ili većoj meri da utiče na visinu periodičnog rezultata. Na taj način, stvoreno je tzv. kreativno računovodstvo, koje svojim tehnikama ili metodama pomaže menadžerima, (su)vlasnicima i/ili računovođama u sastavljanju finansijskih izveštaja koji su obično sačinjeni u skladu sa zakonskom i profesionalnom regulativom, ali suprotno njenom duhu, što za rezultat daje imovinsko-finansijsku i prinosnu poziciju privrednog društva (računovodstvenog entiteta) koja u manjoj ili većoj meri odstupa od one koja bi se mogla okarakterisati kao istinita i fer. Provera „slobode“ u izboru

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adekvatnih računovodstvenih pravila i postupaka, odnosno provera ispravnosti i objektivnosti sastavljenog seta finansijskih izveštaja može se vršiti primenom nekoliko metoda i tehnika koje su razvijene od strane forenzičkih računovođa, ali i eksperata iz drugih oblasti. U nastavku ovog članka pokušaćemo da detaljnije obrazložimo suštinu Beneish-ovog M-score modela za otkrivanje eventualnih nedoslednosti u imovinsko-finansijskoj i prinosnoj poziciji posmatranog računovodstvenog entiteta, rezultate koji potvrđuju njegovu (ne)efikasnost, kao i nedoumice koje još uvek postoje i koje mogu izazvati sumnju u (sve)mogućnost ovog modela u otkrivanju prevara u finansijskim izveštajima.

Ključne reči: Beneish-ov M-score model, kreativno računovodstvo, alternativni računovodstveni postupci, forenzičko računovodstvo, prevare, međunarodna računovodstvena regulativa

1. Introduction

Attempts to define and adopt accounting rules and procedures, i.e., accounting standards "that enable direct comparability of financial statements prepared in different accounting and legal systems" (Šević & Škobić, 2017, 8), occurred as, among other things, a consequence of the internationalisation of business and the globalisation of economic flows, with the aim of accelerating them. The beginning of the intensification of both mentioned processes (globalisation and standardisation of rules for developing uniform financial statements) is related to the last third of the 20th century.

Accounting standards, in most cases, stipulate one procedure for covering the largest number of transactions (business changes) and preparing a set of prescribed financial statements. Certain pressures, above all, from individuals from the most important accounting associations (International Accounting Standards Board - IASB and Financial Accounting Standards Board - FASB), resulted in enabling alternative procedures for certain situations, allowing accountants a certain degree of subjectivity, but also arbitrariness in their application. The manipulative application of basic and/or alternative procedures can, to a greater or lesser extent, influence the level and quality of the asset and income position of the observed accounting entities. That is why several methods and techniques have been developed to detect fraud in financial statements. Beneish M-Score model is the most often exposed one. Its essence, method of use, (in)efficiency and doubts in its application will be discussed below. Our observations will be supported by the results of the financial statement analysis of five companies that demonstrated the highest net profit growth in the Manufacturing Industry sector in 2023.

2. Creative accounting and accuracy of financial statements

The consistent application of stipulated financial reporting frameworks, compliance with the proper bookkeeping principles, accounting regulations and standards represent the necessary prerequisites for compiling a set of financial reports that we could accept without doubt in their accuracy is the consistent application of prescribed frameworks for financial reporting, compliance with the principles of proper bookkeeping, accounting regulations and standards (Đekić et al., 2016. 74). This kind of accounting could be called clean, legal, consistent, conservative, etc. (Đorđević and Mitić, 2020. 23)

The already mentioned lack of flexibility in the accounting inclusion of business changes and procedures

and rules in the preparation and presentation of a set of financial statements, on the one hand, as well as allowing the so-called alternative procedures for individual transactions, on the other hand, resulted in the aspiration of the accountants to present in the financial statements not the actual asset and income position of the observed accounting entity, but "something that is desired by using the existing rules and/or ignoring them" (Karapavlović, 2011, p. 158). Such aspiration of accountants resulted in the creation of creative accounting (aggressive, illegal, manipulative, accounting shenanigans, etc.) which implied the (un)intentional misuse of accounting techniques, principles and standards in the preparation of a set of financial statements. The term "creative" comes from the movie *The Producers* and the Broadway play of the same name. The director and producer of the play sold more than 100% of the ownership rights to the play, assuming that the play would be a failure and that they would not have to pay the profits to the owners. However, despite their efforts to ensure that the play was bad at the premiere so it would be removed from the theater repertoire, the opposite happened and the play became a real hit. This created financial issues for the director and producer, and later this pattern became recognizable in a large number of cases related to accounting scandals (Cvetković & Petković, 2017, p. 308)

The main features of creative accounting could be summarised as follows (Belak, 2011):

- adjustment of financial statements;
- exploiting the legal possibilities of choosing flexible accounting methods, procedures and assessments;
- exploiting insufficiently defined and clear areas in accounting standards that make control and auditing difficult;
- emphasizing the importance of information that corresponds to the reporting entity, and hiding the information that is not favourable for that entity;
- abuses significantly exceeding the legal and professional frameworks of conduct.

Regardless of whether the incorrect information in the financial statements is the result of the intention or the accountant's misjudgement in choosing the basic or alternative procedure, they have in common that they significantly reduce the "use value of the financial statements, either in terms of the direct use of the information contained in them, or as an informational basis for a detailed analysis of a company's performance" (Malinić, 2009. 153).

3. Creative accounting and financial scandals of famous companies

Financial statements of companies receive a kind of validation of their correctness by undergoing a systematic review by independent auditors, who give an opinion on whether they have been compiled in a way that provides a true and fair overview of the assets and income strength of the accounting entity in question. However, despite the conducted independent audit, in the last thirty years some world-famous companies have been the target of accounting shenanigans and different tricks and gimmicks which resulted in serious business issues, often ending in the cessation of their operations (Budić, 2023, p. 83-4). Budić provides a more detailed list of these companies, the most famous among which are: *Helmsley Enterprises Inc.*, USA, in 1986; *Polly Peck*, UK, in 1990; *Maxwell Communications*, UK, in 1992; *Enron*, USA, in 2002; *Tyco*, USA, in 2002; *WorldCom Inc.*, USA, in 2002; *Parmalat SpA*, Italy, in 2003; *America Online Inc. – AOL*, USA, in 2005; *Bernard L. Madoff Investment Securities LLC*, USA, in 2007; *Satyam Computer Service*, India, in 2009, and others. (Mis)uses of accountants in recording business transactions and preparing financial statements are not the only reason that led to the collapse of the operations of the above companies, but are one of the three most frequently cited causes, along with embezzlement and corruption.

It has been shown, therefore, that the independent audit is not an omnipotent mechanism that can detect (mis)uses of the so-called of creative accounting and that the success percentage of this type of control of financial statement validity is negligible (fraud was detected in only 8% of confirmed cases of fraud). Some of the reasons that justify the failure of an independent audit to detect frauds in financial statements are as follows: independent auditors do not recognize management's ability to commit fraud; they are not adequately trained to detect fraud; they lack knowledge, education and experience in recognizing various fraud schemes and rely on the character and integrity of management, instead of professional scepticism (Asare et al., 2015, p. 69).

That is why the emphasis in combating fraud in financial statements is directed at internal auditing, while forensic accountants are "in charge" of fraud detection. The basic task of internal audit should be the continuous monitoring of the overall operations and processes taking place in companies in terms of their improvement, but also the assessment of the possibility of fraud, the incentives and motives of employees to commit fraud, the establishment of controls for the prevention and/or detection of fraud, as well as spotting red flags for fraud, which should be reported to the competent structures in the company (board of directors, supervisory board and audit board, if applicable) (Stanišić, 2008, p. 66).

On the other hand, forensic accounting is a relatively young scientific discipline that, according to the American Institute of Certified Public Accountants, could be defined as "a combination of accounting, auditing, financial, research skills and knowledge of certain areas of the law,

all with the aim of collecting, analysing and evaluating evidence materials and interpreting study results to solve many financial issues" (Crumbley et al., 2007, p. 2). A forensic accountant should possess skills that can enable him/her to prevent and/or detect fraud, prove fraud and evaluate the actual status and published results of an accounting entity. In the execution of the aforementioned tasks, a forensic accountant is assisted by experts from various fields (fraud investigators, loss prevention experts, lawyers, educators, criminologists, etc.), who in most cases are involved in the activities of the Association of Certified Fraud Examiners –ACFE, provide proactive and reactive services and use different analytical techniques in their work (Knežević et al., 2021, p. 23).

The initial basis for the analysis and verification of financial statements is made up of general analysis techniques, which can be classified by applying different criteria. We will mention the most general division of techniques into (Hopwood et al., 2009):

- horizontal analysis - which involves the analysis of an item in the financial statements of the current period with that of the previous period(s);
- vertical analysis - which involves calculating and comparing the percentage shares of individual items in the analysed financial statements, and
- ratio analysis – which focuses on the relationships of items in financial statement, in order to obtain indicators of achieved profitability, liquidity, solvency, activity, etc.

However, for a more detailed analysis of the relationship between the elements of financial statements, carried out by forensic accountants in situations where the credibility and truthfulness of financial statements are suspected, it is not enough to use only general analysis techniques, but they need to be supplemented with (Dimitrijević & Danilović, 2017, p. 315-6):

- preliminary analytical procedures - used to detect areas of high risk of fraud, their nature, time and degree of forensic procedures required;
- independent analytical procedures - used to obtain evidence based on data comparing and harmonising, and determining the credibility of documentation and the correctness of posting and calculating, and
- final analytical procedures - which serve to make conclusions about the impact of problematic transactions on financial statements /

We believe it is important to point out that the classical financial analysis includes a period of two years (comparing items from the current and previous year), whereas with forensic accountants there is no time horizon for conducting the analysis and it is carried out until the moment in which the manipulations with financial statements started.

4. The essence of Beneish M-Score model

When analysing financial statements, it is necessary to apply analytical techniques that can help distinguish "financial statements that have been manipulated from

those that have not been subject to manipulation" (Rajković, 2016, p. 39). With Altman Z Score model, Beneish M Score model represents one of the "two best-known techniques most frequently used in practice and which can significantly indicate the existence or non-existence of fraud in a company's financial statements" (Radojević & Stanković, 2023, p. 241). We will try to explain the essence of Beneish model in more detail below.

Beneish model was developed by the Professor Messod D. Beneish, Indiana University, in 1999. In the course of this model development, the attention was focused on three areas that are subject to manipulation: profit overestimation by recording fictitious income; recording non-existent inventory and improper capitalization of costs (Budić, 2023, p. 85).

In order to set up the model, Beneish included in the experimental sample the financial statements of 74 companies that manipulated financial statements between 1982 and 1992, because they were convicted by the SEC of non-compliance with accounting standards, i.e., US GAAP, as these are US companies, or they have publicly admitted it (Beneish, 1997.). The data obtained from the analysis of their financial statements was compared with the data from the financial statements of other companies from the identical industry (a total of 2,332 companies) in order to determine the differences between the financial statements of the companies whose financial statements were manipulated, compared to the non-manipulated financial statements (Budić, 2023, p. 85). When setting up the model, Beneish determined that the financial statements of new companies in the phase of growth and development, whose growth is based on financing from external sources, where there is a decline in the turnover of receivables and inventories, were manipulated, unlike the statements of companies that have been operating for a long-time year and which have long been under the scrutiny of regulators (Rajković, 2016, p. 39).

Analysis of the samples and comparison of the results helped Beneish form a model that contains a certain number of variables (five or eight depending on the model) and a mathematical formula that helps identify manipulations in financial statements. The indicators used by Beneish in his model are as follows:

Days' Sales in Receivables Index - DSRI – measures change in receivables from customers in relation to sales revenue in at least two consecutive periods, "showing how many times average sales receivables are included in net sales revenue" (Škarić-Jovanović, 2013, p. 57). If the value of the receivables index is less than or equal to 1,031, then there is no doubt that fraud has been committed. A trade receivables index value between 1,031 and 1,465 "indicates the existence of suspected fraud, but this needs to be taken with a grain of salt, as it is possible that the index value was obtained due to the action of many factors unrelated to fraud. If the index is higher than the control value of 1,465, then it is assumed that there is a high probability of fraud in the financial statements" (Dimitrijević & Danilović, 2017, p. 317). Therefore, the

growth of this indicator can, on the one hand, indicate that "a significant increase in the average collection days is associated with a high probability that the revenues, and thus the profit of the period, are overestimated" (Budić, 2023, p. 86) but, on the other hand, it can be a consequence of a perfectly legal activity resulting from increasing sales on credit (Knežević et al., 2021, p. 24).

Gross Margin Index - GMI – is calculated by comparing the gross margin in two consecutive accounting periods, i.e., the gross margin of the previous period with the gross margin of the current period. The value of this indicator higher than 1 shows the deterioration of the gross margin in the current period compared to the previous period. According to Beneish, the reference values are 1.14 (there is no doubt that fraud has been committed) and 1.193 and higher (there is a high probability that there is fraud in the financial statements). There is an almost general agreement among the authors dealing with this issue that "if unusual circumstances are excluded, the coverage margin ratio should remain the same from year to year" (Kellogg & Kellogg, 1991, p. 14).

Asset Quality Index - AQI – the management's intention to affect the achieved periodic result by inappropriate cost capitalisation can be detected through the asset quality index, calculated through the ratio of fixed (long-term) assets minus the value of real estate, plant and equipment with total assets. An asset quality index higher than 1 indicates that management is trying to transfer the costs of the current accounting period to subsequent accounting periods. Reference values for the asset quality index according to Beneish model are 1.039 (no suspected fraud) and 1.254 and higher (a high probability of fraud in the financial statements).

Sales Growth Index - SGI – is calculated through the ratio of the sales revenue in the current accounting period (year) and the sales revenue in the previous accounting period (year) with the sales revenue in the previous accounting period (year). Sales revenue growth by itself is not evidence that financial statements have been manipulated. However, the previously stated statement that managers of new companies, which are in the phase of growth and development, are prone to manipulative actions, indicates the expectations of existing and potential investors "that the company will continuously have high and growing sales and profits, (which) puts the management in a situation where these expectations cannot be realized in any other way than by embellishing the financial statements" (Škarić-Jovanović, 2013, p. 65). Reference values of this index according to Beneish are 1.134 (no suspected fraud) and 1.607 and higher (a high probability of fraud in the financial statement).

Depreciation Index - DEPI – measures the change in the depreciation rate over two consecutive years. A change in the value of this index may be due to the fact that "the value of the assets has been revised or the useful life of the assets has been extended or adjusted upwards" (Knežević et al., 2021, p. 24). A value of this index of 1.001 or lower indicates no suspicion of financial statement fraud,

whereas its value above 1.077 indicates the probability that the financial statements were manipulated.

Leverage Index - LVGI – shows the share or ratio of total debt (borrowed sources of funding) in total assets. "With the help of financial leverage, the company tries to form the capital structure that will serve to maximize the value of the company, thus creating room for manipulations" (Rajković, 2016, p. 41). However, if the value of this indicator is 1.037 or lower, the financial statements are objective, while the leverage value of 1.111 is considered an indicator of suspected manipulation with the observed financial statement.

Total Accruals to total Assets - TATA – it is calculated through "the ratio of total accruals to total assets. Total accruals (calculation base) are calculated as the change in net working capital (excluding cash) less depreciation" (Radojević & Stanković, 2023, p. 242). Reference values of this index according to Beneish are 0.018 (no suspected fraud) and 0.031 and higher (a high probability of fraud in financial statements).

Sales, General and Administrative Expenses Index - SGAI – measures the ratio of administrative expenses to sales revenues in the current year compared to the previous year. A disproportionate increase in administrative expenses in relation to the growth of sales revenue indicates a possible negative trend related to the long-term prosperity of the company. Threshold values of this variable are 1.054 (no suspected fraud) and 1.041 (index value in the financial statements in which there is fraud).

The aforementioned indicators are the basis for two mathematical formulas developed by Beneish, the results of which indicate the probability that the financial statements are the result of manipulations. The first relation for calculating Beneish M Score model has the following form:

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

The five-variable model does not take into account the index of the leverage ratio, the ratio of accounting sizes to total assets and the index of selling and administrative expenses and is represented by the following expression:

$$M = -6.065 + 0.82 * DSRI + 0.906 * GMI + 0.593 * AQI + 0.717 * SGI + 0.107 * DEPI$$

The threshold value for both expressions should be equal to -2.22 or less. If, on the other hand, "the obtained value is higher than the threshold, there are indications that there has been fraud in the financial statements" (Dimitrijević and Danilović, 2017, p. 319). The authors of research related to the application of Beneish M Score model used the aforementioned threshold value as a benchmark for (in)existence of fraud in financial statements, although Beneish later modified the threshold value to -1.78 (Knežević et al., 2021, p. 25).

5. Specificities in the application of the Beneish M-Score model

Numerous authors have tried to confirm or dispute the validity of the Beneish M Score model in detecting fraud in financial statements. Like Beneish, some of tested the model on the financial statements of companies that were proven to be the products of manipulative actions, while others tried to prove the validity of this model on hypothetical examples. Of course, there are also authors who have analysed the financial statements of companies that meet certain assumptions, without being identified as those that have not been compiled using creative accounting techniques. Given that Beneish model is useful but not omnipotent in detecting fraud in financial statements, below we will try to briefly interpret the research results available to us, without intending to confirm or reject them.

Beneish analysis of financial statements from the aforementioned sample of 74 companies that were proven to have manipulated financial statements showed in 75% of cases that manipulations had taken place, "whereas in only 17.5% of cases it was incorrectly determined that the financial statements had frauds, and there were none" (Budić, 2023, p. 89). Budić states that the application of this model should be the "first step" in the analysis, and in order to conclude whether the financial statements contain fraudulent activities, adequately documented detailed research and assurances should be carried out" (Budić, 2023, p. 92). It should be noted that Budić performed his own analysis of Beneish model using data from a hypothetical example. Rajković also accepted a similar approach to Beneish model testing. He analysed financial statements on a hypothetical example of a pharmaceutical company and, considering that he obtained values lower than -2.22 for both models (with five and with eight variables), he concluded that there were no manipulations in the presentation of earning capacity of a hypothetical company. Rajković (2016) also concludes that "the significance of the Beneish M Score model stands out in much more extensive research, e.g., on a sample of several tens or hundreds of companies and their financial statements, when we want to obtain information on quality and reliability of financial reporting in the economy of a country" (Rajković, 2016, p. 42).

On the other hand, Knežević et al. analysed the financial statements of only one company from the textile industry, which deals with the preparation and spinning of textile fibres, and whose shares are listed on the Belgrade Stock Exchange within Sector C - Manufacturing Industry. The results of the analysis of the financial statements showed that the value of Beneish M Score model is below the threshold value of -2.22, but also pointed to the existence of an index with values between the threshold values or above the threshold value, indicating that there may or may not be fraud, and it is necessary to interpret the obtained results with caution. Finally, the authors believe that "this type of model (Altman and Beneish) can play an important role in the decision-making process of investors and banks in the domain of investment risk assessment and credit risk" (Knežević et al., 2021, p. 27).

Kušter tested Beneish M Score model on the example of processing industry companies, which met the following criteria: the entity is classified in the area of the processing industry on the territory of Serbia; the legal form of the entity is a joint-stock company, it is a small or medium-sized enterprise and the entity has an extremely low, low or moderate level of overall business risk. A total of 73 entities met the above criteria, and the results of the research showed "that only three entities from the sample show an increased risk, or more precisely, the probability that financial statements have been manipulated" (Kušter, 2021, p. 22-6).

Dimitrijević and Danilović (2017) used the financial statements of five "companies where tax evasion was proven or which were reported for tax evasion" to confirm the usefulness of Beneish model. These were: PZP Niš, FAM Kruševac, GS Tekstil fashion Požarevac, AMAN d.o.o Beograd, and MERA INVEST d.o.o Beograd. The results of the research showed that of the mentioned companies, "three exceeded the threshold values in as many as five indices, while the other two companies exceeded the thresholds in four indices." This only indicates that the application of Beneish model as a fraud detection method can significantly help in controlling the financial reporting quality in the Republic of Serbia" (Dimitrijević & Danilović, 2017, p. 323).

The most recent example of testing Beneish M Score model in our conditions is the research conducted by Radojević and Stanković (2023, p. 244-7). Ten public

joint-stock companies were included in the sample, and five of them were on the Prime Listing (stock market symbols of these companies are AERO, FINT, JESV, MTLC, and NIIS), and the remaining five on the Open Market (COKO, CGLT, PANO, CHMS, and VDAV). Therefore, there were companies whose shares were rated the best and those whose shares had somewhat worse performance. The analysis covered the period from 2018 to 2021. The authors found that, particularly in 2021, companies whose shares show better performance have significantly worse indicators (for four out of five observed companies from the Prime Listing the obtained values are higher than -2.22, indicating that there is a possibility of fraud in financial statements) and concluded that "joint-stock companies whose shares have better performance do not have more favourable indicators of the existence of fraud in financial statements compared to joint-stock companies whose shares have worse performance" (Radojević & Stanković, 2023, p. 249).

We will conclude the presentation on Beneish's M-score model with an analysis of the financial statements of the five top-ranked companies in the Manufacturing Industry sector that achieved the highest absolute net profit in 2023. These companies also rank among the top 25 enterprises in the Report on the Top 100 Companies in 2023 (Agencija za privredne registre, 2024).

The results of the analysis and the values of relevant indicators are presented in the following table format:

Table 1. Overview of Index Values and M-score of Companies

Companies	Farmina Pet Foods Indija	Philip Morris Niš	Coca-Cola Srbija	Tigar Tyres Pirot	Peštan d.o.o. Bukovik	Reference Values
DSRI	1.0716	0.9653	0.9285	0.7512	1.0843	1.031–1.465
GMI	0.9947	1.0338	1.0014	0.5820	1.0066	1.041–1.193
AQI	0.9325	1.1354	1.9461	0.6620	1.0874	1.039–1.254
SGI	1.3688	1.1200	1.0379	1.0596	0.9285	1.134–1.607
DEPI	1.0020	1.0781	0.9972	0.9596	1.0695	1.001–1.077
SGAI	1.0000	0.9899	1.1724	0.9581	1.2500	1.134–1.607
LVGI	0.6015	1.0410	1.6482	1.3876	0.9527	1.037–1.111
TATA	0.0615	0.0513	0.0194	0.0354	0.0641	0.018–0.031
M (5)	-2.6403	-2.8036	-2.3886	-3.6645	-2.8357	-
M (8)	-1.6969	-0.7532	-2.2803	-2.9636	-2.1470	-

Source: Authors by Agencija za privredne registre. (n.d.)

Indexes whose values are between the reference values shown in Table 1 are italicized, while values exceeding the reference ranges, which indicate suspicion of potential (un)intentional errors in the financial statements, are bolded. Furthermore, the values of the M-score below the critical threshold of -2.22 are also bolded.

Farmina Pet Foods d.o.o. Indija, a producer of pet food, represents the most successful company in the observed sector. In 2023, Farmina achieved a 65.7% increase in net profit due to growth in foreign market sales, coupled with slower growth in operating expenses, resulting in a two-thirds higher operating profit compared to the previous year. The achieved net profit amounts to 7,538 million RSD. The value of Beneish's M-score with five variables indicates no evidence of financial statement manipulation for this company, though some indexes suggest values

within the reference ranges. Finally, the TATA index and the M-score with eight variables indicate a suspicion that not everything may be entirely in order.

Philip Morris Operations a.d. Niš, a tobacco product manufacturer, recorded a net profit of 6,302 million RSD in 2023, despite relatively modest performance indicators (1.3% growth in net profit and a 2.1% decline in operating income). The M-score model with five variables suggests no suspicion of inaccuracies in the analyzed financial statements. However, several indexes for this company also fall within the reference ranges, while the DEPI, TATA, and M-score with eight variables exceed the thresholds indicating potential irregularities in the financial reports.

Coca-Cola HBC – Srbija, d.o.o. Zemun, which fills, sells, and distributes some of the world's most famous soft drinks, achieved a net profit of 5,782 million RSD in 2023. Similar to the previous company, Coca-Cola cannot boast other performance indicators (lower net results, a 15.6% decrease in operating profit, a 37.5% reduction in material sales profits, etc.). Both M-score values for this company suggest no evidence of manipulative activities in its financial statements. However, a few indexes exceed the reference ranges (AQI and LVGI). The poor debt ratio index (LVGI) primarily results from a significant increase in current liabilities (10,454 million RSD in 2023 compared to 5,791 million RSD in 2022).

Tigar Tyres d.o.o. Pirot, a company engaged in the production of car tires, footwear, and technical rubber, reported a net profit of 5,213 million RSD. This positive net result is 41.1% lower than the previous year, reflecting reduced profitability due to a slight decline in business activity and lower revenues from the sale of products and services in foreign markets. The values of both the five-variable and eight-variable M-scores show no indications of manipulative activities in preparing the financial statements of this company. As with the previous company, the debt ratio index (LVGI) stands out due to the drastic growth in long-term liabilities (15,257 million RSD in 2023 compared to slightly over 282 million RSD in 2022).

Finally, Peštan d.o.o. Bukovik, a private company, is a Balkan leader in producing and distributing polymer-based products and solutions. Its net profit in 2023 amounted to 4,501 million RSD, 10.5% higher than the previous year. The M-score with five variables indicates no evidence of financial statement manipulation for this company. A similar conclusion can be drawn from the eight-variable M-score, which, while slightly below the critical threshold of -2.22, is satisfactory when considering its adjusted value of -1.78. Except for the TATA index, which is above the reference value, all other indicators for this company are below the values that may indicate manipulation in financial statement preparation or are within the reference ranges.

It is a fact that the Beneish M-Score model is a useful and widely used forensic accounting technique in detecting fraud in financial statements. However, most authors in their conclusions mention the expressions like "assumption", "probability", "there are indications", "there is a real possibility", etc. which only indicates that this model can be a useful tool in detecting irregularities in financial statements, but without more detailed research and combining and comparing the results with other methods and techniques (for example, Altman Z Score) it cannot confirm with certainty the existence of manipulative actions when compiling a set of financial statements. An additional limitation is the fact that this "model is based on the foundations of US accounting standards (GAAP), which can create certain differences if the financial statements are compiled based on International Financial Reporting Standards" (Dimitrijević & Danilović, 2017, p. 317).

The expert analysis of fraud and malversation in the past can be useful, because in this way it is possible to "obtain certain patterns of behaviour of persons who can be potential perpetrators of fraud," which will enable the easier development of control mechanisms and increase the efficiency of the work of forensic accountants and external auditors on suppression and/or detection of criminal activities in accounting and finance (Đekić et al., 2016).

Manipulations in financial statements that are the product of creative accounting methods and techniques can therefore be detected using some of the aforementioned and/or more detailed models. On the other hand, it is necessary to establish an effective set of measures that will limit or minimise their (mis)use. Some of the measures that should be taken include (Remenarić et al., 2018, p. 196):

- adjustment of accounting standards to limit subjectivity in the assessment of balance sheet positions and emphasise consistency in the application of accounting methods;
- insisting on the role that internal and external audit should play in identifying and reporting abuses in evaluation, as well as in preventing other accounting manipulations;
- preventing frequent changes of external auditors;
- engagement of external members of the board of directors and audit committee;
- establishment of effective corporate governance mechanisms;
- consistency in whistle-blower protection policy;
- continuous insistence on compliance with the code of ethics;
- emphasizing the development and application of forensic accounting;
- introducing potential investors to the risk of manipulation of financial information and consistent enforcement of the penal policy by national institutions.

The aforementioned set of measures, with the use of, first of all, Beneish M-Score model, can help, as we have already noted, in controlling and raising the level of quality of financial reporting in the Republic of Serbia, because we are witnessing that it is often pointed out that financial statement has only formal significance and "are often compiled without a valid accounting basis, by persons without accountability and professional credibility. All this leads to the collapse of financial reporting to the extent that the question of trust in financial statements is raised" (Đukić, Pavlović, 2014, p. 114).

6. Conclusion

A true and fair presentation of the asset, financial and yield strength of the accounting entity is the task that accountants and managers face when preparing a set of financial statements. In the last 50 years, efforts have been intensified to define and harmonise accounting rules internationally in order, among other things, to limit the possibilities of applying the provisions of the standard, but also with the help of accounting "shenanigans and tricks",

i.e., manipulative actions in the financial statements to show the earning capacity of the accounting entity that deviates to a greater or lesser extent from that which would be could be called true and fair. Accountants and managers find the basis for such behaviour in the fact that there are at least two, and often more, different procedures for recognising, measuring and valuing certain balance positions and posting some business changes, the subjective, inconsistent and/or incorrect application of which can mislead users of financial statements. The (un)intentional errors resulting from recording business transactions in a way that aims to satisfy certain motives of managers, owners and accountants are measured in millions. That is why there are attempts to develop techniques that can help detect manipulations and fraudulent actions in financial statements.

Beneish M-Score model is one of the most commonly used techniques that can help uncover accounting shenanigans and tricks. Its effectiveness is demonstrated on examples of analysis of financial statements that have been proven to be the product of manipulative actions. We have applied this model to specific examples of financial statement analyses for companies in the Manufacturing Industry sector, which recorded the highest absolute net profit amounts in the previous year, 2023. The conclusions we reached largely confirm the usefulness of this model. Of course, as we stated before, the mentioned technique is not omnipotent and it is necessary to compare and supplement the results obtained by applying this analysis technique with other techniques, in order to determine with certainty, the existence of fraudulent actions when compiling the analysed financial statements. Although the ideal of perfect financial reporting cannot be achieved, it should not be a cover behind which creators of fraudulent financial statements can hide. It is necessary to act preventively in order to ensure true and fair financial reporting as much as possible. The set of measures specified at the end of the paper should be a guide to enable the negative consequences of the application of creative accounting methods and techniques to be minimised.

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