Disproportions in the Description Ability of Prediction Models for Change in the Accounting System

Jozef Lukáč

University of Economics, Faculty of Business Economics, Tajovského 13, 04001 Košice, Slovakia

Abstract **– The change in the value of financial indicators can be triggered by several factors. A result of a change in the accounting system shows that the company's achieved financial indicators may change. The reason for the differences is a different way of reporting and recalculation of items in the financial statements, where some items are recognized and classified in a different group of assets than under the accounting regulations in the Slovak Republic. The Balance Analysis of Rudolf Douch (1996), Taffler's model (1984) and Králičeк's Quick Test (1993) were used to point out the differences in evaluation based on financial indicators in selected prediction models. The aim of the paper is to analyze the changes that result in the change of the accounting system from national accounting legislation to the accounting system according to IAS/IFRS. We assume that individual items of assets and liabilities or costs and revenues that enter into the calculation of individual prediction models achieved different values due to changes in the method of reporting in the financial statements of the analyzed company for the same accounting period in two accounting systems.**

Keywords **– Financial analysis, predictive models, accounting system, IFRS, national accounting legislation.**

DOI: 10.18421/TEM112-04
https://doi.org/10.18421/TEM112-04

Corresponding author: Jozef Lukáč ,
University of Economics, Faculty of Business Economics, Tajovského 13, 04001 Košice, Slovakia.
Email: jozef.lukac@euba.sk

Received: 07 October 2021.
Revised: 05 March 2022.
Accepted: 11 March 2022.
Published: 27 May 2022.

1. Introduction

From the cross-section of studies carried out on the implementation of IFRS to the domestic accounting system, we can say that in most cases there has been a change in financial indicators, both in favour and against selected financial indicators. An important finding from this cross-section of studies is that the authors in the beginning of the study of the impact of IFRS implementation on domestic accounting systems analyzed the magnitude of change on individual financial indicators – it was only a numerical determination of the magnitude of change, their quantitative expression. At present, the authors place more emphasis on the qualitative side, and the priority is not only the quantitative expression of the change in financial indicators, but also the justification of this change through legislation (method of valuation, depreciation method, reporting) and other factors affecting the implementation of IFRS (staff readiness, attitude of state authorities to the harmonization process and others). This fact also affects the explanatory power of predictive models.

2. Changes in Financial Indicators During the Transition to Another Accounting System

We can also include summary valuation indices (bankruptcy and creditworthiness models) among the traditional approaches. The evaluation of the performance of enterprises based on traditional procedures uses aggregate evaluation indices to assess the financial situation of the enterprise through a few absolute, differential and ratio indicators. These indicators define the basic areas in the forecast of financial health - financial stability, financial structure, income and expenditure analysis, efficiency of asset management, corporate solvency, and productivity.

The models that financial analysis most often uses to predict financial health can be included in the Tamari Index, Králičeк Quick Test, Credit Rating Index, Altman Z score, Taffler Model and other

models. In terms of the application of selected models in our scientific contribution, we focused on the Balance Analysis of Rudolf Doucha, Model by Taffler and Králiček Quick Test. It is on these prediction models that we will demonstrate the change in the significance value depending on the change in the accounting system. At the end of the article, we will also address the changes in the value of the company caused by the change in the accounting system.

As part of the change in financial indicators depending on the accounting system used, we record the following opinions of experts and scientists.

The findings of the author´s research [1] revealed that the adoption of IFRS brought an increase in the average value of financial companies in Nigeria and also that the adoption of IFRS has a significant impact on profit after tax. A similar study was carried out by the other author [2], who analyzed the impact of the adoption of IFRS on banks. The adoption has increased the market value of the company. On the contrary, a study carried out between 2012 and 2020 on French companies suggests that the adoption of IFRS has no effect on changing the financial performance of companies [3]. Research on the implementation of IFRS was also carried out in the case of Jordanian Banks, where they analyzed the indicators return on assets, return on equity, change in earnings per share [4]. A study analyzing the effect of IFRS on Nasdaq listed companies found that more than 60% of companies achieved a statistically confirmed increase in assets and liabilities. Within the indicators, the change in liquidity and profit was negative, in solvency positive. The adoption of IFRS has had the greatest impact on the healthcare and communication technologies sector [5].

Significant findings were made by research from the conditions of Greek companies, where the results suggest that the adoption of IFRS had a significant impact on the financial position and reported performance, especially in liquidity ratios [6]. Research has been conducted from the environment of German companies, which declares that the adoption of IFRS has led to an increase in the corporate performance of German companies. On the other hand, the relationship between capital structure and corporate performance has been weakened [7]. The analysis of the change after the adoption of the new accounting system in the TOP 100 Czech companies is presented in the paper by scientific worker [8] where he describes that based on the results, the value of the ROA indicator is skewed in more than 66% of cases. In the context of the impact of the change in accounting standards on the liquidity of the capital market in Poland, no clear conclusions were reached on the impact of the adoption of IFRS [9].

3. Methods and Research Object

The first step for the analysis of differences in the explanatory power of prediction models is the transfer bridge - the transformation of the Balance Sheet statement prepared in accordance with national accounting legislation into the Statement of Financial Position of the company prepared in accordance with IAS/IFRS. The case study is developed in the conditions of a specific company. The precondition for the compilation of the transfer bridge of the company XYZ a.s., which operates in the food industry, is the financial statements prepared in accordance with the national accounting legislation prepared as of 31 December 2018. (Note - the 2019 financial statements are not yet available due to COVID - 19 and the deferral of the tax return).

The company carries out business activities mainly on foreign markets. XYZ a.s. is a real company, which does not want to be named due to data sensitivity due to Act no. 18/2018 Coll. on the protection of personal data. The company is included in the group of small and medium-sized enterprises. Since its inception, the company has kept accounting in the system of double-entry bookkeeping according to national accounting legislation until 2017, when it decided to report financial statements in accordance with IAS/IFRS under the influence of operations in foreign markets. All this information is presented in Table 1.

Table 1. Input data in the form of financial statements

Accounting intem (31.12)	IAS/IFRS in €	National accountig legislation in €	Diference in €	Difference in %
ASSETS	***621976***	***597889***	***24 087***	***4,03***
Financial investments	56443	66724	-10281	-15,41
Land, buildings, equipment	257890	201301	56 589	28,11
Real estate investment	3104	0	3 104	-
Intangible assets	14475	14523	-48	-0,33
Long - term receivables	2975	3113	-138	-4,43
Money	6334	6363	-29	-0,46
Trade and other receivables	216284	207403	8 881	4,28
Stocks	64468	97467	-32999	-33,86
LIABILITIES AND EQUITY	***621976***	***597889***	***24 087***	***4,03***
Own capital	323085	289760	33 325	11,50

Registered capital	181726	181726	0	0,00
Retained earnings	141359	108034	33 325	30,85
Total liabilities	298891	308129	-9 238	-3,00
Bank loan	50497	50497	0	0,00
Long - term trade and other payables	12664	15540	-2 876	-18,51
Deferred tax liability	20781	12914	7 867	60,92
Finance lease liabilities	4057	0	4 057	-
Short - term loans	49417	49417	0	0,00
Trade and other payables	139209	162473	-23264	-14,32
Short-term reserves	0	17286	-17286	-100,00
Tax payable	6174	0	6 174	-
Short - term part of finance lease liability	16 087	0	16 087	-

In the following section, we will explain selected prediction models that we used in our research.

Balance analysis of Rudolf Doucha - The system of the mentioned analyzes uses ratios to determine the financial health and financial situation of the company based on 4 variables. Based on the use of only a small number of financial indicators, the analysis of Rudolf Doucha is intended as an additional analysis for the decisions of the management or management of the company. The main task is to determine the view of the financial situation in the company based on its rapid use [10]. The construction of the model itself is as follows:

$$(2* S + 4* L + A + 5* R) / 12$$

where:
S (equity / fixed assets)
L (financial assets + receivables) / short-term resources)
R (economic result / assets)
A (income / liabilities)

Taffler´s model - A prerequisite for monitoring the bankruptcy risk of the analyzed company is an equation consisting of four financial ratios, which are multiplied by weight. If the resulting value in the interval is above 0.2, the given enterprise has a higher probability of bankruptcy and if the value above 0.3, the analyzed enterprise has a lower probability of bankruptcy [11] .The model has the following form:

$$0,53* T1 + 0,13* T2 + 0,18* T3 + 0,16* T4$$

where:
T1 (profit before tax / short-term debts)
T2 (current assets / liabilities)
T3 (short-term debts / total assets)
T4 (financial assets / short-term debts)

Králiček´s Quick Test – model´s indicator is calculated as the ordinary arithmetic average of the marks obtained for the values of the individual indicators. All indicators therefore have the same weight. The assessment represents the use of indicators in financial stability and income situation. Subsequently, the company is included in the group of financial stability, gray zone, or bankruptcy zone. Kralick's Quick Test requires different input data depending on which of the test variants the company decides to apply [12]. The input data are: Equity, Assets (or liabilities), Liabilities (debts or foreign capital), Cash Flow (sum of net profit and depreciation), Revenues from main activity, Net profit, Interest expense (for the calculation of the first variant), Income tax rate (for the calculation of the first option), Bank loans (for the calculation of the second option). Resulting value:

$$\textbf{points awarded for criteria } A + B + C + D$$

where:
A (equity / total assets)
B (liabilities - short - term financial assets) /operating CF
C (return on assets)
D (operating CF / operating income)

4. Research and Results

The next part of the contribution will reflect changes that occur in different models based on percentages. The following section contains the resulting values of individual prediction models expressed according to the partial coefficients of national accounting legislation and IAS/IFRS.

Based on the performed balance analysis of Rudolf Douch, we predict a low probability of bankruptcy using four proportional financial indicators. The results are presented in Table 2. We can state that with different reporting methods there was no different forecast for the company, but the financial ratios were affected. The highest difference is achieved by the return on assets item due to the different amount of profit in both accounting systems, like the pyramidal decomposition of ROA.

Table 2. Comparison of values and explanatory power of Rudolf Douch model

Model construction	***National accounting legislation***	***IAS/IFRS***	***Difference***
S (equity / fixed assets)	1,0108	0,9647	-4,77%
L (financial assets + receivables) / short-term resources)	1,0021	1,0624	5,68%
R (economic result / assets)	5,43	7,27	25,31%
A (income / liabilities)	0,4796	0,4876	1,64%
The resulting value	1,1548	1,3239	12,77%
The company is unlikely to go bankrupt.			

The resulting value of the indicator of Tafler model has changed by more than 2% compared to national accounting legislation in the Taffler model presented in Table 3, which means that the transition to the IAS/IFRS accounting system did not affect the explanatory power of the prediction model and the company model predicts a low probability of bankruptcy. However, there are different partial indicators, the changes of which are caused by the change of individual balance sheet items that enter the calculation. Similar results are achieved by the creditworthy Králičkov Qick Test, which is presented in Table 4 and which ranks the company among the companies that achieve creditworthiness.

Table 3. Comparison of values and explanatory power of Tafler model

Model construction	***National accounting legislation***	***IAS/IFRS***	***Difference***
T1 (profit before tax / short-term debts)	0,1255	0,1245	-0,78%
T2 (current assets / liabilities)	1,0100	0,9605	-5,16%
T3 (short-term debts / total assets)	0,3833	0,3291	-16,46%
T4 (financial assets / short-term debts)	-0,9621	-0,8423	-14,22%
The resulting value	0,1129	0,1153	2,14%
Based on the chosen model of the company, there is a low probability of bankruptcy.			

Table 4. Comparison of values and explanatory power of Kralickov Quick Test

Model construction	***National accounting legislation***	***IAS/IFRS***	***Difference***
A (equity / total assets)	0,4852	0,5194	6,58%
B (liabilities - short - term financial assets) / operating CF	-595,6641	-577,4877	-3,15%
C (return on assets)	5,43	7,27	25,31%
D (operating CF / operating income)	-0,0017	-0,00167	-5,75%
The resulting value	11 points	11 points	-
The model places the company among the very good companies that achieve creditworthiness.			

Based on the analysis of predictive models of financial analysis for the analyzed company, we can state that the change in the accounting system does not affect the final value of the model indicator, but we can observe changes in the partial indicators of model construction.

The last case in which the explanatory power of the financial statements data may be significantly distorted is the determination of the value of the company using the book value of the company. We consider the situation when the company needs to determine the carrying amount of the company at a given moment. Determining the carrying amount of an enterprise is the simplest but least reliable method based on the carrying amount of the asset [13]. The starting point for compiling this method is to know the input data: assets in which the company's assets are tied and the item of external resources represented by long-term and short-term items of reserves, loans, and liabilities. The difference is the equity of the company, which represents the net book value of the analyzed company. Table 5 shows the difference in book value.

Table 5. Comparison of values in determining the value of the company based on the accounting method

	National accountig legislation	***IAS/IFRS***	***Absolute difference***	***Relative difference***
Book value of assets	597 889,8 €	621 976,9 €		
Book value of liabilities	308 129,5 €	298 891,5 €		
Net book value of the company	289 760,4 €	323 085,4 €	33 325 €	11,50 %

We can confirm that the change in the accounting system will increase the book value by 11.50% when switching to IAS/IFRS. Although the method used is the simplest and its sources are accurate information from accounting records, non-current assets are not measured at fair value, which leads to inaccuracies in valuation. The time factor is also not considered, so receivables and payables are valued at the nominal values they had at the time of origination. Intangible assets that are not recorded in the company's accounts are not included in the valuation. The last and biggest disadvantage is the absence from the revenue potential of the company, the possibilities, and prospects of its development.

We could also apply static methods to the company - property and liquidation, which are used in expert activities. Similarly, we would get different results, which would result in distorted information for courts and law enforcement authorities that would require a business appraisal. From the point of view of the client, when determining the value of assets according to IAS/IFRS, there could be speculation and manipulation of the value of the company to obtain financing from external sources, or artificially increasing the results of financial performance compared to competing companies.

5. Conclusion

According to the performed analysis of financial indicators of these models, we can state that the value of most indicators has changed. The most significant changes occurred because of the above-mentioned changes in assets and liabilities, which later enter the construction of financial indicators and thus logically changed the values of indicators. The explanatory power of the prediction models was maintained during the change of the accounting system in the balance analysis of Rudolf Douch, the Taffler model and Králiček's Quick Test. The change occurred only in the partial indicators of individual models.

According to the Jaccard coefficient, the Slovak Republic is the most compatible with IFRS, at a level of more than 64%. Within the V4 countries, Poland follows with more than 57%, the Czech Republic 56% and Hungary more than 53% [14].

The aim of aggregate indices of assessing the financial health of a company is to predict the future state of the company, namely financial bankruptcy, or good financial health [15]. The explanatory power of these models and indices was questioned during the financial crisis in 2008 and the crisis caused by the spread of COVID-19 viral disease, when companies that were in good financial condition according to the models and did not face financial problems went bankrupt. For this reason, several authors are skeptical, e.g., to the Altman index [16], [17].

Further criticism of traditional indicators points to the fact that traditional indicators do not consider the risk factor, time or sacrificed costs. The reason for the criticism is the fact that traditional indicators in the evaluation of the company's performance come into conflict between the company's market valuation and the accounting valuation based on financial statements [18].

Other author states that accounting methods and procedures do not always correspond to the economic view of performance. Traditional indicators do not give feedback to company managers, as the company is doing in other areas of its activity, and they mostly have the character of a short-term perspective with a lack of strategic focus. From a management point of view, they are insufficiently usable for planning and control purposes and do not provide enough information for decision-making. [19]

The importance of financial indicators for the company's management is also emphasized by several authors who also include non-financial indicators to monitor the company's financial situation as a management tool [20]. It is among such indicators that we could include evaluation using a balance score card, which has not yet been used in the environment of IAS / IFRS implementation [21]. Strategic financial planning could thus be the starting point for effective corporate governance from a financial perspective - of course also in the area of implementing international accounting standards [22].

A special area could be the benefits of the research in this paper for the content of the expert activity, for which knowledge of the different values of assets and liabilities could seriously affect the resulting general value of assets using the property or liquidation method. Consequently, the resulting objectified value of the company could differ in national accounting legislation and IAS/IFRS. It is also important to monitor the development of financial indicators in connection with the COVID-19 crisis [23], [24]. We firmly believe that we will succeed in the future.

Acknowledgements

The paper conducts research in area of Economic correlations of the share of women in management positions at specific companies in the Slovak Republic and was supported by the sources of the frame of VEGA project No: 1/0363/20.

References

[1]. Ekwe, M. C., Abaa, E. O., & Okrolor, J. A. (2020). Adoption of International Financial Reporting Standards and financial performance of listed deposit money banks in Nigeria. *Corporate governance*.

[2]. Hameedi, K. S., Al-Fatlawi, Q. A., Ali, M. N., & Almagtome, A. H. (2021). Financial performance reporting, IFRS implementation, and accounting information: Evidence from Iraqi banking sector. *The Journal of Asian Finance, Economics and Business*, *8*(3), 1083-1094.

[3]. Wali, S. (2020). IFRS and Financial Performance: Study in the French Context. *International Journal of Financial Research*, *11*(2).

[4]. Al-Qudah, H. A. (2020). The impact of financial performance of stock prices of Jordanian Islamic banks (During period from 2010 to 2018). *International Journal of Economics and Financial Issues*, *10*(1), 228.

[5]. Žilaitytė, L. (2021). *Impact of transition to IFRS 16 on the financial performance of Baltic listed companies* (Master's thesis).

[6]. Tsalavoutas, I., & Evans, L. (2010). Transition to IFRS in Greece: financial statement effects and auditor size. *Managerial Auditing Journal*.

[7]. Abdullah, H., & Tursoy, T. (2021). Capital structure and firm performance: evidence of Germany under IFRS adoption. *Review of Managerial Science*, *15*(2), 379-398.

[8]. Strouhal, J., Štamfestová, P., Ključnikov, A., & Vincúrová, Z. (2018). Different approaches to the ebit construction and their impact on corporate financial performance based on the return on assets: some evidence from Czech top100 companies. *Journal of competitiveness*, *10*(1), 144.

[9]. Klimczak, K., & Wachowicz, A. (2017). The benefits and costs of IFRS implementation in Poland–the investors' perspective. *Zeszyty Teoretyczne Rachunkowości*, (95 (151)), 163-181.

[10]. Karpac, D., & Bartosova, V. (2021). Prediction of Financial Health of Business Entities of Selected Sector Using Balance Analysis II. by Rudolf Doucha and Verification of Its Predictive Ability through ROC. In *SHS Web of Conferences* (Vol. 91). EDP Sciences.

[11]. Vavrek, R., Kravčáková Vozárová, I., & Kotulič, R. (2021). Evaluating the financial health of agricultural enterprises in the conditions of the slovak republic using bankruptcy models. *Agriculture*, *11*(3), 242.

[12]. Majdáková, A., Giertliová, B., & Hajdúchová, I. (2020). Prediction by financial and economic analysis in the conditions of forest enterprises. *Journal of Forest Science*, *66*(1), 1-8.

[13]. Kislingerová, E. (2005). Hodnota podniku, její měření a řízení. *Acta Oeconomica Pregnesia. Acta Oeconomica Pragensia, roč*, *13*.

[14]. Strouhal, J., Horák, J., & Bokšová, J. (2017). Accounting Harmonization in V4-Countries and its Impact on Financial Data. *International Advances in Economic Research*, *23*(4), 431-432.

[15]. Fenton, N. E., & Neil, M. (1999). A critique of software defect prediction models. *IEEE Transactions on software engineering*, *25*(5), 675-689.

[16]. Fejér-Király, G. (2015). Bankruptcy prediction: A survey on evolution, critiques, and solutions. *Acta Universitatis Sapientiae, Economics and Business*, *3*(1), 93-108.

[17]. Salimi, A. Y. (2015). Validity of Altmans Z-Score model in predicting Bankruptcy in recent years. *Academy of Accounting and Financial Studies Journal*, *19*(2), 233.

[18]. Pont, M., & Shaw, R. (2003, January). Measuring marketing performance: A critique of empirical literature. In *ANZMAC 2003: a celebrations of Ehrenberg and Bass: marketing discoveries, knowledge and contribution, conference proceedings* (pp. 2064-2073). ANZMAC.

[19]. Adriana, K., & Drahomíra, P. (2010). *Finanční analýza-Komplexní průvodce s příklady*. Grada Publishing as.

[20]. Gallo, P., Mihalčová, B., Timková, V., & Tomčíková, Ľ. (2018). Importance of financial and non-financial indicators in companies with the balanced scorecard concept. *Calitatea*, *19*(165), 34-38.

[21]. Gallo, P., Mihalčová, B., Gallo Jr, P., Čabinová, V., & Tomčíková, L. U. (2019). Application of the balanced scorecard as a strategic management tool in practice: a case of Slovak tourism sector. *Geo Journal of Tourism and Geosites*, *24*(1), 19-28.

[22]. Benková, E., Gallo, P., Balogová, B., & Mihalčová, B. (2019). Effects of using strategic planning as a managerial tool: A case of industrial companies. *Polish Journal of Management Studies*, *20*.

[23]. Goh, T. S., Henry, H., & Albert, A. (2021). Determinants and prediction of the stock market during COVID-19: Evidence from Indonesia. *The Journal of Asian Finance, Economics, and Business*, *8*(1), 1-6.

[24]. Salisu, A. A., & Vo, X. V. (2020). Predicting stock returns in the presence of COVID-19 pandemic: The role of health news. *International Review of Financial Analysis*, *71*, 101546.