Jones' Model and Its Modifications in the Conditions of the Slovak Republic

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Abstract. One of the key tasks of financial accounting from its beginnings to the present day is to determine the performance of the company. The financial statements should provide users with a true and fair view of the financial position and financial performance of the entity during the period. At present, profit represents the most frequently accepted measure of a company's financial performance. An important prerequisite for profit as a reliable measure of performance is its quality, which can be influenced by various factors or techniques resulting from earnings management. This paper aims to compare the detection capability of the Jones model and its modifications for assessing the occurrence of earnings management in the conditions of the Slovak Republic. We use the regression analysis and comparison method, based on which we compare the detection capability of the Jones model and its modifications for assessing the occurrence of earnings management in the conditions of the Slovak Republic. The contribution of the paper lies in the observation of the Jones model and its modifications to determine a suitable model for assessing the existence of earnings management in companies in Slovakia, which will be the subject of future research.
Keywords: Earnings relevance, earnings management, Jones model, Modifications of the Jones model

1 Introduction

One of the key tasks of financial accounting from its beginnings to the present day is to determine the performance of the company. [19] The financial statements should provide users with a true and fair view of the entity's financial position and financial performance during the period. [10] At present, the company's managers and analysts use a wide range of tools, algorithms, and methods to determine the value of profit representing the most commonly accepted measure of a company's financial performance, to predict the future development of the company's financial health. [12] The relevance of the accrual principle applied in accounting is undeniable. [25] Accrual accounting is, thanks to the time and material allocation of costs and revenues, a good system for evaluating the effectiveness of management, based on which it is possible to measure and detect earnings management. [14] Earnings management is one of the most challenging, debated, controversial and at the

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same time the most promising topics in finance and financial management. [11] Nevertheless, it is still difficult to provide a uniform definition of earnings management, as evidenced by the fact that the authors of various professional studies very often perceive earnings management differently. The main reasons for the lack of consensus on earnings management are its inconsistency, ambiguity, and problematic measurability. Studies aimed at detecting and measuring earnings management are very often based on discretionary accruals and work with models that estimate the discretionary share of reported profit, starting with simple models that identify discretionary accruals with total accruals to more sophisticated models that try to divide the total accruals into a discretionary and non-discretionary part. However, systematic evidence regarding the relative performance of these models in detecting earnings management does not yet exist.

1.1 Earnings relevance

The question of why profit is such an important indicator of a company [15] that it has become the subject of management and manipulation is answered by Ronen and Yaari [6] explaining three approaches based on the separation of shareholder ownership and management in publicly traded companies. This creates a conflict of interest between the parties, as management decisions may not always be in line with the views of business owners. Depending on the awareness of existing third parties about the true profit and the power to implement the decisions taken, these authors distinguish between a costly contracting approach, a decision-making approach, and a legal approach. The costly contracting approach emphasizes the importance of profit information in creating effective contracts. In the event of unforeseen situations, the parties remain bound by the old contracts and use the earnings management application to fulfill their contractual contracts. In terms of informing third parties about the true profit and the power to make decisions, the first approach presupposes complete information and the power of shareholders to control the management of the company. The decision-making approach describes profit as a valuable source of information for decision-making in a given company. If the shareholders are rational, it is not possible to carry out earnings management without the implicit or explicit consent of investors. The decision-making approach presupposes power, but not shareholder awareness. The legal approach is based on the lack of tools for business owners to effectively control management. However, profit allows owners to use limited tools more effectively, helping to eliminate information asymmetries between owners.

1.2 Earnings management

The phenomenon of earnings management belongs to the integral and fundamental part of their business finance. [16] Earnings management is a legal and very effective method of accounting techniques and may be used to obtain specific objectives of the enterprises involving the manipulation of accruals. [23] However, despite the unequivocal legality of earnings management, the creative nature of these activities, which show the financial situation and performance of the company according to management's ideas and not according to the needs of users of financial statements, cannot be denied, as McKee [26] confirms. The first of the definitions relating to earnings management by Degeorge, Patel and Zeckhauser [4] reads Strategic use of managerial judgment in influencing profit values reported by external users of financial statements. It is achieved primarily by timing reported or actual economic events to shift between periods. Other authors define EM as the use of flexibility in the selection of accounting methods that influence managers' decisions about future cash flows. [13] Sosnowski [24] explains that reducing financial limitations of enterprise can cause earnings management because enterprise tries to obtain higher external capital.

1.3 Earnings management testing

The issue of measuring and detecting earnings management is a relatively frequently researched problem. Despite a large amount of professional literature, there is no uniform opinion on the most effective testing methods. In the researched literature, the method using residues from aggregated accrual models, which is based on the classical Jones model, is the most used. The second most used method is models based on specific accrual accounts. In research, the most used residual model from aggregated accrual accounts in most cases provides results that indicate evidence or confirmation of the use of earnings management. This model is also cited by Dechow, Sloan and Sweeney [17] as the model with the strongest and best results. Although he is not talking exactly about residues from aggregated accruals, he is talking about the modified Jones model, which is the basis for it, so they can be considered identical. On the other hand, Dechow, Richardson, and Tuna [18] use the modified Jones model to test accrual accounts as explanatory variables for the skewed, non-standard profit distribution that is identified, for example, by Burgstahler and Dichev [2].

1.4 Jones model and its modifications

The present review of the scientific literature related to earnings management points to diversity [1] because the Jones model and its modifications use the different intensity of earnings management testing. [7] Jones's model mitigates the assumption of non-discretionary accrual constant. This model takes into account the impact of changes in the economic situation of the company on the non-discretionary accrual with the help of tangible fixed assets and changes in sales as independent variables of the model. Jones's model divides the time series of companies' profits into two stages, which are estimation periods and event periods. The estimation period represents zero discretion accrual. The event period assumes that the discretionary accrual is not zero, resulting in earnings management. The main assumption of Jones' model is that companies do not implement earnings management during estimation periods. This assumption is very unlikely to be met, which may result in bias in the measurement and detection of earnings management. [5] Jones' model includes the assumption of non-discretion in sales. If a company manages profit through discretionary revenues, then Jones's model removes part of the profit from the discretionary accrual estimate, which the author herself acknowledges as a limitation of her model. [8] The consequence of the limitation is the fact that the given model detects earnings management, even in its absence. [27] Dechow, Sloan, and Sweeney [17] sought to streamline Jones' original model and therefore proposed to adjust the variable change in sales (ΔREV) to the variable change in receivables (ΔREC). The purpose of such a modification was to reduce the measurement error of the discretionary accrual if the discretionary accrual was generated through revenues. Jones' modified model points to the assumption that any change in sales revenue from a supplier credit is the result of earnings management. However, it is uncertain in the literature whether a given modification improves the original Jones model. The authors dealing with this issue, Jeter and Shivakumar [3] consider such an assumption to be unrealistic and therefore tried to design their model. As part of the creation of their model consisting in the modification of the original Jones model, they proposed to include cash flow from operating activities in the non-discretionary part of earnings management, due to its more effective detection within a group of companies with extreme cash flow reporting. The author Kasznik [20] also tried to improve Jones' original model, incorporating cash flow (FOCFO) as the third explanatory variable in his model. Another of the authors on the subject, Key [9] added a new variable to the original Jones model, which is intangible assets, and justified this transformation by using the relationship between intangible assets and depreciation, which are one of the components of the non-discretionary accrual. Teoh, Welch, and Wong [21] also attempted to modify Jones' model and focused on short-term accruals. They defined short-term accrual as the difference between changes in non-monetary current assets and changes in operating current liabilities. They determined the non-discretionary part of the short-term accrual by increasing the company's sales. Kothari et al. [22] presented a modification of the original Jones model, which is also known as "performance matching" while offering 2 approaches. The first is the pairing of similar companies, which alleviates the need for the least-squares DA estimation. The second, linear approach, is to consider the return on assets (ROA) to regulate the performance of the organization.

2 Methodology

The conference contribution aims to compare the detection capability of the Jones model and its modifications for assessing the occurrence of earnings management in the conditions of the Slovak Republic. For achievement relevant data we use the financial database, Amadeus. In our research, we analyze the Jones model and its modifications in the conditions of the Slovak Republic. Our analysis is applied to a sample of 1253 enterprises in the condition of the Slovak republic. In research, we use a selection method and comparison method, based on which we compare the detection capability of the Jones model and its modifications for Slovak enterprises according to the adjusted coefficient of determination, standard deviation, and the level of statistical significance of the earnings model as such and individual independent variables entering the analyzed earnings models. Within the analysis of statistical significance, we use the F - the test by the medium of setting hypotheses H0 and H1.

3 Results and discussion

We analyze profit models using criteria proposed by the literature, which are adjusted coefficient of determination, standard deviation, and the level of statistical significance of the profit model as such and individual independent variables entering the analyzed profit models. We apply individual profit models to a sample of 1253 Slovak companies, within which we selected companies according to the following criteria.

Table 1. Selected criterion

Criterion	**Values**
Sector	the automotive industry, mechanical engineering, electrical engineering, energy, mining, construction
Sales	> 3 000 000 EUR
Earnings	> 100 000 EUR
Assets	> 5 000 000 EUR
State of the company	uncontested
Type of ownership	private domestic enterprises, private international enterprises, private foreign enterprises

Source: Own processing.

3.1 The adjusted coefficient of determination

The adjusted coefficient of determination expresses the explanatory power of the profit model. We performed a statistical regression analysis to determine the values of the adjusted coefficient of determination. Using the adjusted coefficient of determination, we then explain the variability and relevance of the analyzed profit models, by comparing the obtained results over time and between models, with higher values indicating a higher explanatory power of the model and vice versa.

Table 2. The adjusted coefficient of determination

Earnings model	**The adjusted coefficient of determination**			
	2015	**2016**	**2017**	**Average**
Jones model	0.1093	0.0380	0.0329	0.0601
Modified Jones model	0.1155	0.0509	0.1255	0.0973
Jeter and Shivakumar model	0.1228	0.0371	0.0345	0.0648
Kasznik model	0.1217	0.0478	0.0513	0.0736
Key model	0.1060	0.0387	0.0324	0.0590
Teoh, Welch and Wong model	0.0085	0.0095	0.0968	0.0383
Kothari model	0.1132	0.0475	0.1292	0.0966

Source: Own processing.

Based on the table, we can see that in 2015, the two highest values of the adjusted coefficient of determination were recorded. These are cash flow models by Jeter and Shivakumar with a coefficient of determination of 0.1228 and Kasznik with a coefficient of determination of 0.1217. Both of these profit models thus explain the variability of the total accrual of more than 12%. The achieved values for the remaining profit models are as follows: Modified Jones model with determination coefficient value 0.1155, Kothari model with determination coefficient value 0.1132, Jones model with determination coefficient value 0.1093, and Key model with determination coefficient value 0.1060. These profit models explain the variability of the total accrual in the range from 10 to 12%. The relatively low explanatory power represented by the adjusted coefficient of determination was achieved by the Teoh, Welch, and Wong model, with a coefficient value of 0.0085, which indicates the variability of the dependent variable to less than 1%. In the examined the year 2016, it reached the highest value of the adjusted coefficient of determination 0.0509 Modified Jones model. This model is followed by the Kasznik model with the value of the coefficient of determination 0.0478 and Kothari model with the value of the coefficient of determination 0.0475, Key model with the value of the coefficient of determination 0.0387, Jones's model with the value of the coefficient of determination 0.0380 and cash flow model by Jeter and Shivakumar with the value of the coefficient 0.0371. Relatively low values of the adjusted coefficient of determination were achieved similarly to 2015 by Teoh, Welch, and Wong model with the value of the coefficient of determination 0.0095. In the observed period of 2017, the Kothari model reached the highest explanatory power represented by the adjusted coefficient of determination 0.1292, which explains the variability of the total accrual to almost 13%. Then follows the Modified Jones model with the value of the coefficient of determination 0.1255, Teoh, Welch and Wong model with the value of the coefficient 0.0968, Kasznik model with the value of the coefficient of determination 0.0513, Jeter and Shivakumar model with the value of the coefficient of determination 0.0345. Jones's model reached the value of the coefficient of determination 0.0329, Key model reached the lowest value of the coefficient of determination at the level of 0.0324.

3.2 Standard deviation

Through the analysis of the standard deviation, we explain the variability of the values of the variables of the selected profit models. If the standard deviation becomes low, it means that the given profit model more effective measures and detects earnings management in a selected sample of companies operating in the conditions of the Slovak Republic. The following tables provide a summary of each profit model.

Table 3. Overview of Standard Deviations

Jones model		**Intercept**	**ΔREV**	**PPE**	
2015	Coefficient	0.0232	0.0194	-0.1794	
	Standard deviation	0.0138	0.0190	0.0302	
2016	Coefficient	-0.0019	0.0172	-0.1063	
	Standard deviation	0.0143	0.0209	0.0307	
2017	Coefficient	-0.0078	-0.0500	-0.1064	
	Standard deviation	0.0191	0.0217	0.0397	
Average	Coefficient	0.0045	0.0045	0.1307	
	Standard deviation	0.0157	0.0205	0.0335	
Modified Jones model		**Intercept**	**ΔREV - ΔREC**	**PPE**	
2015	Coefficient	0.0252	-0.0342	-0.1764	
	Standard deviation	0.0137	0.0200	0.0303	
2016	Coefficient	0.0069	-0.0490	-0.1094	
	Standard deviation	0.0141	0.0235	0.0305	
2017	Coefficient	0.0102	-0.1280	-0.1192	
	Standard deviation	0.0181	0.0216	0.0377	
Average	Coefficient	0.0141	0.0704	0.1350	
	Standard deviation	0.0153	0.0217	0.0328	
Jeter and Shivakumar model		**Intercept**	**ΔREV**	**PPE**	**CFO**

2015	Coefficient	0.0034	0.0070	-0.1910	0.2149
	Standard deviation	0.0163	0.0195	0.0305	0.0945
2016	Coefficient	-0.0099	0.0150	-0.1119	0.0840
	Standard deviation	0.0171	0.0210	0.0314	0.0987
2017	Coefficient	-0.0248	-0.0539	-0.1151	0.1575
	Standard deviation	0.0236	0.0220	0.0402	0.1287
Average	Coefficient	-0.0104	0.0106	0.1393	0.1521
	Standard deviation	0.0190	0.0208	0.0340	0.1073
Kasznik model		**Intercept**	**ΔREV**	**PPE**	**ΔCFO**
2015	Coefficient	0.0253	-0.0022	-0.1833	0.2904
	Standard deviation	0.0137	0.0213	0.0300	0.1323
2016	Coefficient	-0.0028	-0.0011	-0.1081	0.3084
	Standard deviation	0.0143	0.0228	0.0305	0.1592
2017	Coefficient	-0.0132	-0.0710	-0.1035	0.4589
2017	Standard deviation	0.0190	0.0229	0.0393	0.1830
Average	Coefficient	0.0031	0.0248	0.1316	0.3526
	Standard deviation	0.0157	0.0223	0.0333	0.1582
Key model		**Intercept**	**ΔREV**	**PPE**	**IA**
2015	Coefficient	0.0232	0.0193	-0.1792	-0.0082
	Standard deviation	0.0141	0.0190	0.0304	0.5720
2016	Coefficient	0.0009	0.0169	-0.1042	-0.6589
	Standard deviation	0.0146	0.0209	0.0308	0.6123
2017	Coefficient	-0.0117	-0.0501	-0.1063	0.6763
	Standard deviation	0.0196	0.0216	0.0394	0.7160
Average	Coefficient	0.0041	0.0046	0.1299	0.0031
	Standard deviation	0.0161	0.0205	0.0335	0.6334
Teoh Welch and Wong model		**Intercept**		**ΔSALE-ΔREC**	
2015	Coefficient	-0.0410		-0.0390	
	Standard deviation	0.0080		0.0210	
2016	Coefficient	-0.0345		-0.0460	
	Standard deviation	0.0083		0.0240	
2017	Coefficient	-0.0363		-0.1209	
	Standard deviation	0.0105		0.0219	
Average	Coefficient	-0.0373		0.0686	
	Standard deviation	0.0089		0.0223	
Kothari model		**Intercept**	**ΔREV - ΔREC**	**PPE**	**ROA**
2015	Coefficient	0.0209	-0.0330	-0.1742	0.0003
	Standard deviation	0.0156	0.0200	0.0301	0.0008
2016	Coefficient	0.0091	-0.0500	-0.1100	-0.0001
	Standard deviation	0.0164	0.0239	0.0305	0.0009
2017	Coefficient	0.0272	-0.1337	-0.1243	-0.0019

	Standard deviation	0.0214	0.0220	0.0380	0.0012
Average	Coefficient	0.0191	0.0722	0.1362	0.0006
	Standard deviation	0.0178	0.0220	0.0329	0.0010

Source: Own processing.

Based on the table, we can see that the Jones model achieves relatively high values of the average standard deviations of individual variables. The first variable change in sales (ΔREV) represents the average standard deviation of 0.0205. The average standard deviation of the second independent variable on tangible fixed assets (PPE) reaches the average standard deviation of 0.0335. In the modified Jones model, the first variable expressed as the difference between the change in sales and the change in receivables (ΔREV - ΔREC) causes the average standard deviation to decrease to 31% of the average value of the coefficient and the average standard deviation of the second variable tangible fixed assets (PPE) reaches 25% of the average value of the coefficient. The Jeter and Shivakumar model also achieves relatively high values of standard deviations. The mean standard deviation of the variable ΔREV is 0.0208. The average standard variable PPE reaches 25% of the average value of the coefficient and CFO reaches 71% of the average value of the coefficient. The Kasznik model is again one of the models achieving relatively high values of the mean standard deviation. The mean standard deviation ΔREV is 90% of the mean value of the coefficient. The average standard deviation of the PPE is 25% of the value of the coefficient. The last variable ΔCFO reaches the average value of the standard 45% of the average value of the coefficient. The average standard deviations in the case of the Key model reach extreme values. The average standard deviation of the variable ΔREV reaches the value 0.0205, which represents an extreme proportion of the average value of the coefficient. The average standard deviation of the PPE is 26% of the value of the coefficient. The standard deviations of long-term intangible assets (IA) reach high values in the individual years 2015-2017, which is also reflected in the high shares of the average standard deviation from the average value of the coefficient. The Teoh, Welch, and Wong model with a single independent variable ΔSALE - ΔREC achieves relatively low values of the standard deviation and the average standard deviation reaches 33% of the average value of the coefficient. The Kothari model for the variable ΔREV - ΔREC achieves an average standard deviation of more than 31% of the average value of the coefficient and the second variable PPE reaches more than 24%. The average standard deviation of the ROA compared to the other variables of this model reaches a high share of the average value of the coefficient.

3.3 The significance level of models

As part of the analysis, we test profit models using the F - the test of statistical significance, while setting hypotheses H0 and H1. Hypothesis H0 tells us that the studied idol is not statistically significant, hypothesis H1 tells us that the studied idol is statistically significant. The following table provides an overview of the accepted hypotheses and a percentage expression of the statistical significance of the investigated profit models.

Table 4. Statistical significance of models

Model	**2015**	**2016**	**2017**	**Statistical significance %**
Jones model	H_1	H_1	H_1	100
Modified Jones model	H_1	H_1	H_1	100
Jeter and Shivakumar	H_1	H_1	H_1	100
Kasznik model	H_1	H_1	H_1	100
Key model	H_1	H_1	H_1	100

Teoh Welch and Wong model	H_0	H_0	H_1	33.33
Kothari model	H_1	H_1	H_1	100

Source: Own processing.

Based on the table, we can see that the Jones model, the Modified Jones model, the Jeter and Shivakumar model, the Kazsnik model, the Key model, and the Kothari model represent statistically significant models because we have accepted hypothesis H1. The percentage of their statistical significance reaches 100%. The Teoh, Welch, and Wong model is statistically insignificant in 2015 and 2016 because we adopted the H0 hypothesis. The percentage expression of the statistical significance of a given profit model reaches 33.33%.

3.4 The significance level of variables

We test the variables contained in the individual analyzed profit models by comparing the p-value with the significance level $\alpha = 0.05$. Again, we set the hypotheses H0 and H1. Hypothesis H0 states that the variables contained in the analyzed profit models are not statistically significant and hypothesis H1 states that the variables contained in the analyzed profit models are statistically significant. If the comparison shows that the p-value is less than the significance level α, we reject hypothesis H0 and accept hypothesis H1. A model whose variables are statistically significant explains earnings management correctly, and conversely, a model whose variables are statistically insignificant indicates that its variables do not explain earnings management, ie the manipulation of discretionary accrual. The following table provides an overview of accepted and rejected hypotheses for all variables contained in the analyzed profit models, together with a percentage expression of their statistical significance.

Table 5. Statistical significance of variables

Variables	**2015**	**2016**	**2017**	**Statistical significance %**
Jones model				
ΔREV	H_o	H_o	H_1	33.33 %
PPE	H_1	H_1	H_1	100.00 %
Modified Jonesovej model				
ΔREV – ΔREC	H_o	H_1	H_1	66.67 %
PPE	H_1	H_1	H_1	100.00 %
Jeter and Shivakumar				
ΔREV	H_o	H_o	H_1	33.33 %
PPE	H_1	H_1	H_1	100.00 %
CFO	H_1	H_o	H_o	33.33 %
Kasznik model				
ΔREV	H_o	H_o	H_1	33.33 %
PPE	H_1	H_1	H_1	100.00 %
ΔCFO	H_1	H_o	H_1	66.67 %
Key model				
ΔREV	H_o	H_o	H_1	33.33 %
PPE	H_1	H_1	H_1	100.00 %
IA	H_o	H_o	H_o	0.00 %
Teoh Welch and Wong model				

ΔSALE – ΔREC	H_o	H_o	H_1	33.33 %
Kothari model				
ΔREV – ΔREC	H_o	H_1	H_1	66.67 %
PPE	H_1	H_1	H_1	100.00 %
ROA	H_o	H_o	H_o	0.00 %

Source: Own processing.

Based on the results from the table, we see that the Jones model achieves a high percentage expression of the statistical significance of the variables contained, especially in the case of the PPE variable, which appears to be statistically significant throughout the analyzed period. However, the variable ΔREV is recorded for statistical significance only in the last year of 2017, and therefore the percentage expression of the statistical significance of this variable is at the level of 33.33%. The modified Jones model achieves a high percentage of the statistical significance of all independent variables. The variable ΔREV - ΔREC is statistically insignificant only in the first year of 2015, the variable PPE is statistically significant in the whole analyzed period. The Jeter and Shivakumar model also achieves a high percentage of the statistical significance of the variable only in the case of PPE. The remaining variables appear to be statistically significant and their percentage of statistical significance reaches the level of 33.33%. The Kasznik model has a statistically significant variable, which is PPE in all three years, and a ΔREV variable, which is statistically significant in only one of the three analyzed periods. The variable ΔCFO is statistically significant only in two of the three analyzed periods, while its percentage of statistical significance reaches the level of 66.67%. The Teoh, Welch, and Wong model contains only one variable ΔSALE - ΔREC, which, however, is statistically significant only in the last year of 2017, while its percentage of statistical significance reaches the level of 33.33%. The variables contained in the remaining models appear to be statistically insignificant for all three years, with the result that they do not explain the manipulation of the discretionary accrual. Although the key model achieves a high percentage expression of the statistical significance of the PPE variable, the ΔREV variable is statistically insignificant, reaching a level of statistical significance of 33.33% and the IA variable is statistically significant, while its statistical significance is at 0%. Kothari's model also contains a statistically insignificant variable ROA, whose level of statistical significance reaches 0%.

3.5 Final evaluation of the achieved results

We evaluated selected analyzed profit models based on three criteria, which adjusted the coefficient of determination, standard deviation, the level of statistical significance of individual profit models, and statistical significance of variables contained in the analyzed profit models. The following table provides an overview of the criteria met by the given profit models for the examined period of three years.

Table 6. The final summary of selected models

Earnings management models	**The adjusted coefficient of determination**	**Standard Deviation**	**Statistical**		**Fulfilled criteria**
			model	**variables**	
Jones model	*x*	*x*	✓	*x*	1
Modified Jones model	✓	✓	✓	✓	4
Jeter, Shivakumar model	*x*	*x*	✓	*x*	1
Kasznik model	*x*	*x*	✓	✓	2
Key model	*x*	*x*	✓	*x*	1

Teoh, Welch, Wong	x	✓	x	x	1
Kothari model	✓	x	✓	x	2

Source: Own processing.

Based on the table, we see that the Modified Jones model meets all the criteria, because this model achieved the highest value of the adjusted coefficient of determination, the lowest values of average standard deviations of independent variables contained in the model, high percentage of statistical significance not only of the model but also variables. Kasznik's model and Kothari's model meet two of the four criteria, with Kazsnik's model meeting the criterion of statistical significance of the model itself and its variables, and Kothari's model meeting the criterion of the adjusted coefficient of determination and statistical significance of the model itself. The remaining models such as Jones' model, Jeter and Shivakumar model, Key model and Teoh, Welch, and Wong model meet one of the four criteria. The Jones model did not meet the criteria of the adjusted coefficient of determination, standard deviation, and statistical significance of the variables contained in the model. Jeter and the Shivakumar model did not meet the criteria of the adjusted coefficient of determination, the standard deviation, and also the statistical significance of the variables contained in this model. The key model did not meet the same criteria. The Teoh, Welch, and Wong model did not meet the criterion of the adjusted coefficient of determination and statistical significance of the model itself, but also its variables. Based on the results of the analysis, the Modified Jones model appears to be the most effective profit model for measuring and detecting earnings management in the conditions of the Slovak Republic. Compared to the other analyzed profit models, this model achieves a higher value of the adjusted coefficient of determination and the lowest average standard deviation. It is a statistically significant model, while almost all of its variables reach statistical significance.

4 Conclusion

The analysis was focused on the measurement and detection of earnings management in the conditions of the Slovak Republic using the Jones model and its modifications. To find out whether the Jones model and its modifications can capture and detect earnings management in the conditions of the Slovak Republic, we set four criteria, based on which we assessed the effectiveness of selected models. The four main criteria included the adjusted coefficient of determination, the standard deviation, the statistical significance of the profit models, and the statistical significance of the variables contained in the analyzed profit models. The highest explanatory power represented by the average value of the adjusted coefficient of determination was achieved by the Modified Jones model at the level of 0.0973, which means that the model explains the variability of the total accrual to 9.73%. The second in order is Kothari's model with a value of 0.0966. The following are Kasznik's model with a coefficient value of 0.0736, Jeter, and Shivakumar with a coefficient value of 0.0648, Jones's model with a value of 0.0601, Key model with a value of 0.0590. The Teoh, Welch and Wong models show the lowest explanatory power expressed by the average value of the adjusted coefficient of determination at the level of 0.0383. The second criterion was the standard deviation of the variables contained in the analyzed profit models. In terms of this criterion, the Modified Jones model was the most effective, mitigating the high standard deviation of the first variable of the original Jones model. Its modification into the variable ΔREV - ΔREC caused a decrease in the average value of the standard deviation to 31% of the average value of the coefficient. The average standard deviation of the PPE variable reached almost 25% of the average value of the coefficient. The Teoh, Welch, and Wong models also achieved low values of the mean standard deviation. The statistical significance of the profit model itself was met by several models, including the Jones model, the Modified Jones model, both cash flow models, the Key model, and the Kothari model. The percentage expression of statistical significance in the examined period reaches the level of 100% for all analyzed models. In terms of the statistical significance of individual variables contained in the analyzed profit models, the Modified Jones model was the most effective. This model achieves a high percentage of statistical significance for both. The Kasznik model satisfies the last criterion. Based on the above findings, we consider the Modified Jones model to be the most effective in the conditions of the Slovak Republic.

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