

# Verification of Earnings Management in Slovak Enterprises using Teoh, Welch and Wong model

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**Abstract:** Earnings management involves management's ability to influence whether to manipulate reported earnings through accounting methods. Earnings is a profit for businesses and are, therefore, a major indicator for both internal and external users of financial information. Using reported earnings, internal and external entities can assess the financial health of a particular business. The main reason why companies use earnings management, i.e. earnings manipulation, is to achieve predetermined earnings values and thus to present the positive financial situation of businesses to the outside. This paper focuses on the verification of the existence of earnings management in the Slovak Republic in 2015-2017 by applying the model of the authors Teoh, Welch, and Wong. We apply the model to a set of Slovak companies in three ways, using the discretionary accrual and its estimation, assessing the occurrence of earnings management and determining the direction, degree or extent of earnings management. Our goal is to find out whether earnings management occurs in companies in the Slovak Republic and whether Slovak companies manipulate their earnings downwards or upwards. In our research, we use the modeling method, comparison method, and statistical analysis.

**Keywords:** discretionary accrual; earnings; earnings management; earnings management detection

**JEL Classification:** M4

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## 1. Introduction

Earnings management is a much-debated topic in the world of finance, which is influenced by many factors and circumstances. In the literature, many authors address various topics related to earnings management that are related to the current market situation, such as why managers influence earnings, which factors can influence the managerial decision to choose earnings management, how they effectively measure manipulation or how the concept is defined.

Earnings is a profit for businesses and are, therefore, a major indicator for both internal and external users of financial information. Earnings is a topical issue in today's business world and provide a specific perspective on the company's financial situation. (Jakoubek and Brabenec 2012) Using reported earnings, internal and external entities can assess the financial health of a particular enterprise. (Valaskova et al. 2018a) Many entrepreneurs are still very cautious in predicting the future financial health of the enterprise. (Siekelova et al. 2015) The ability to accurately predict business failure is a very important problem in financial decision-making, (Šuleř 2017) while inaccurate forecasts can be misleading by external entities and weaken their credibility in the business. (Wawryszuk-Misztal 2017) At the same time, earnings are an important item of financial statements designed to present a true and fair view of a company's financial performance. (Weissova et al. 2015) Businesses with higher earnings are therefore more attractive to external entities than businesses with lower earnings. The main reason why companies use earnings management, ie earnings manipulation, is to achieve predetermined earnings values and thus to present the positive financial situation of businesses to the outside.

### *1.1. Definition of earnings management*

There are different perspectives on earnings management in the literature. By Siregar and Utama (2008) earnings management represents a complex process involving the accounting judgment that underlies not only the income statement but also the other financial statements and related disclosures. Earnings management signals managers' motivation to increase company value. (Di and Marciukaityte 2015) According to Callao, Jarne, and Wróblewski (2014), earnings management is a purposeful intervention in external financial reporting, to reach earnings targets, by varying the accounting practices. This activity is realized without violating accounting regulations, and it can, but won't necessarily, mislead stakeholders into believing certain financial information. Earnings management refers to companies' strong incentives to use judgment in financial reporting and in structuring transactions to alter financial reports". (Burgstahler and Dichev 1997) Linck et al. (2013) explain that reducing the company's financial limitations may be the aim of the earnings management, because of obtaining higher external capital. (Sosnowski 2017) Another author describes earnings management as the manipulation of accounting numbers within the scope of generally accepted accounting principles (GAAP). (Dechow 1994)

### *1.2. Detection of earnings management*

Earnings management detection is based on accruals. Dechow and Skinner (2000) submits that the accrual is used to reduce irregularity in the undertaking that was recognized at another time. Beneish (1999) explains that the use of accrual techniques is less visible in businesses and therefore the difficulty of detecting them or comparing them to the actual transactions in the business is higher.

In the literature related to earnings management, we distinguish between discretionary and non-discretionary accruals. Non-discretionary accrual is proposed on management by GAAP/IFRS and in the discretionary accrual, managers can manage earnings because they have flexibility in making accounting choices. (Shahzad 2016) The estimated value of discretionary accruals can achieve positive or negative numbers because the manipulation of financial statements can be directed towards achieving the desired management objectives. (Bešlić et al. 2015) Another of the authors explain that discretionary accruals are mainly conducted in the interval between the end of an exercise and the period of publication of the financial statements. (Cupertino et al. 2015) Another author explains that the discretionary accrual represents a reserve of non-compulsory expenditure that has not yet been incurred but is nevertheless recorded in the books while the non-discretionary accrual represents pre-booking of an obligatory expense that has yet to be realized, but is already recorded in the enterprise's accounting records. (Chang et al. 2019)

There are several various earnings models focused on the measurement and detection of earnings management. (Valaskova et al. 2018b) In our analysis, we focused on verifying the existence of earnings management in Slovak companies using the model of authors Teoh, Welch, and Wong, which we found out from the previous analysis as the most suitable earnings model in the Slovak Republic.

## **2. Methodology**

We use the Amadeus financial database to obtain the data needed to carry out our research. The total number of businesses generated by the Amadeus financial database is 21,084,937 businesses. A total of 260,429 businesses were generated within the Slovak Republic. The initial selection of Slovak companies is based on criteria related to defining the range of values for financial items such as sales, total assets, and profit. After applying these criteria, the scope of Slovak enterprises decreased to 2,769 companies. Subsequently, we select Slovak enterprises according to whether they are still existing or canceled enterprises and also according to their ownership, where we include private domestic enterprises, private international enterprises, and private foreign enterprises. In this selection, we also exclude Slovak companies with missing data from the analysis. The result of this selection is to reduce the size of enterprises to 2,330 Slovak enterprises. Lastly, we apply extreme values reporting when selecting a sample of Slovak companies. We test extreme values by applying a Z-score method that takes into account two parameters, the standard deviation, and the mean. Extreme values are those

which exceeded the value 3. After applying all the above criteria, the total set of 2,155 Slovak enterprises in the period of three years 2015-2017.

To verify the existence of earnings management in the conditions of the Slovak Republic, we apply a modeling method using which we propose the application of Teoh, Welch and Wong model in Slovak companies. Using statistical analysis, we estimate the discretionary parts of accruals of a selected set of Slovak enterprises. To assess the existence of earnings management in Slovak companies, we use a comparison of the values of the discretionary accrual of the fictitious file with the values of the discretionary accruals of the file we selected with the Slovak companies. We used a nonparametric Mann - Whitney test to compare both sets. To determine the direction, degree, and extent of earnings management in the Slovak Republic, we use the method of comparing percentages and average values of discretionary accruals.

### 3. Results and Discussion

Our analysis includes the discretionary accrual and its estimate, the assessment of the existence of earnings management of Slovak companies and the direction, determination of the degree or extent of earnings management.

#### 3.1. Discretionary accrual and its estimation in the Slovak Republic

As the first method of applying the model of the authors Teoh, Welch, and Wong, to the group of companies we selected, we chose the estimate of the discretionary accrual. Based on the regression analysis, we estimated the discretionary parts of accruals for each Slovak enterprise in our selected set of enterprises, through which we can interpret the prediction error of the model. We then proceeded to the quantified descriptive characteristics of the estimated individual discretionary parts of the accruals, which are summarized in Table 1 below.

**Table 1.** Discretionary parts of total accruals and their descriptive characteristics.

<b>Descriptive characteristics</b>	<b>Discretionary accrual in 2015</b>	<b>Discretionary accrual in 2016</b>	<b>Discretionary accrual in 2017</b>
Average	-0.078290	-0.045852	-0.046536
Standard deviation	0.342316	0.165296	0.163556
Median	-0.036272	-0.031271	-0.031938

In 2016, the average value was -0.045852. In 2017 there was a slight change and the average value fell to -0.046536. In 2015, the average value was the lowest at -0.078290. Based on the above data, we can see that the average values in 2015-2017 are negative. These negative values are an indicator of the downward management of earnings by our selected set, which means that they are trying to manage earnings by reducing it. The highest standard deviation was recorded in 2015 at approximately 0.342316. In the following years, the value of the standard deviation decreased. In 2016, the standard deviation was 0.165296 and in 2017 it reached 0.163556. In 2015, the median value was -0.036272. In 2016 the median value reached -0.031271 and in 2017 the median value was -0.031938.

#### 3.2. Verification of the existence of earnings management in the Slovak Republic

The second way of applying the model of authors Teoh, Welch and Wong is to assess the existence of earnings management within Slovak companies. To assess the existence of earnings management, we have created a fictitious file. We created this fictitious set in the absence of earnings management (the values of discretionary accruals are equal to mule or close to zero). Creating a fictitious file serves us to assess the differentiation of the values of the discretionary accruals of the fictitious file with the values of the discretionary accruals chosen by the file with Slovak companies. If this differentiation is high, then the companies in the Slovak Republic in our sample tend to manipulate earnings. However, if the differentiation is low or zero, earnings manipulation by Slovak companies in our sample does

not occur. We applied the Mann - Whitney test to compare both sets. This is a non-parametric test that does not assume a normal distribution of characters in the file. In hypothesis testing, we chose the null hypothesis (H0) and the alternative hypothesis (H1). The null hypothesis (H0) assumes that companies in the Slovak Republic do not manipulate earnings. The alternative hypothesis (H1) assumes that companies in the Slovak Republic manipulate earnings. Which of the two set hypotheses we accept and which we reject by comparing the p-value and the significance level ( $\alpha = 0.05$ ). The following table provides an overview of the results of the Mann Whitney non-parametric test over three years.

**Table 2.** Overview of Mann-Whitney test results.

Parameter	Period		
	2015	2016	2017
Significance level	0.05	0.05	0.05
p-value	< 0.0001	< 0.0001	< 0.0001
Hypothesis accepted	H1	H1	H1
Decision	Earnings manipulation	Earnings manipulation	Earnings manipulation

Based on the data in the table, we can see that in the reporting period 2015-2017 the level of significance is higher than the p-value, indicating that in the reporting period 2015-2017 our analyzed set of companies has detected the existence of earnings management, that we have adopted an alternative hypothesis (H1) that shows that businesses are manipulating earnings.

### 3.2. Determination of the direction, degree, and extent of earnings management in the Slovak Republic

Verifying the existence of earnings management, although we found that businesses in the Slovak Republic manipulate earnings in 2015-2017, but based on these results we can not say with certainty whether earnings is manipulated by decreasing or increasing it, so we are the third way to apply the model Teoh, Welch and Wong chose to determine the direction, degree, and extent of earnings management. So, to determine the direction, degree, and extent of earnings management, we proceeded as follows. First, we calculated the percentage of discretionary accruals, positive and negative, because the discretionary accrual represents the manipulation of earnings by increasing and the non-discretionary accrual by decreasing. We have calculated the percentage over all three years and table 3 provides a brief overview.

**Table 3.** Expressing the percentage of discretionary accruals.

Discretionary accrual	Period			Average
	2015	2016	2017	
Positive DA	36.15%	36.01%	35.13%	35.76%
Negative DA	63.85%	63.99%	64.87%	64.24%

Based on the percentage of discretionary accruals, we can say that in the reporting period 2015-2017, when the existence of earnings management was found in all three years, the percentage of non-discretionary (negative) accruals is higher compared to the percentage of discretionary (positive) accruals. The percentage of non-discretionary accrual increased in individual years. In 2015, the percentage was 63.85%. In 2016, the percentage increased to 63.99%. In 2017, the percentage increased to 64.24%. Unlike the non-discretionary accrual, the percentage of the discretionary accrual developed in the opposite direction. In 2015, we recorded a percentage of 36.15%. In 2016, the percentage fell to 36.01%. In 2017, we recorded the lowest percentage of discretionary accrual at 35.13%. Comparing the percentage of discretionary accruals achieved, we can say that more than half of businesses in the Slovak Republic tend to manipulate earnings by reducing it because the percentage of non-discretionary (negative) accruals in each year is higher than the percentage of discretionary (positive)

accruals. Once we have determined which direction earnings are being manipulated, we determine the degree of earnings management, using the average value of discretionary accruals. The average values, expressed as a coefficient, are given in table 4 below.

**Table 4.** Average values of discretionary accruals.

Discretionary accruals	Period			Average
	2015	2016	2017	
Average value +DA	0.100930	0.095027	0.088535	0.094831
Average value -DA	0.179752	0.125129	0.119675	0.141519
The difference value	-0.078823	-0.030102	-0.031140	-0.046688

From table 4, we can see that the average value of the discretionary (negative) accrual in 2015 is higher than the average value of the discretionary (positive) accrual. When we compare the average values of discretionary accruals in 2016, we see that the average value of the discretionary (negative) accrual is again higher than the average value of the discretionary (positive) accrual. There was no change in 2017, which suggests that in each year the manipulation of earnings by decreasing it is more obvious than manipulating earnings by increasing it. Once we have determined the direction and degree, we can determine the extent of earnings management. To determine the extent of earnings management, we use average values and percentages of individual discretionary accruals. The results are presented in Table 5 below, where the individual coefficient values were calculated by multiplying the average value of the discretionary accruals and the percentage of these discretionary accruals.

**Table 5.** Discretionary accrual as an indicator of the extent of earnings management

Scope of discretionary accrual	Period			Average
	2015	2016	2017	
Scope of positive DA	0.036485	0.034218	0.031100	0.033934
Scope of negative DA	0.114775	0.080071	0.077636	0.090827

Based on the data from table 5, we can see that the range of positive discretionary accrual in 2015 is lower than that recorded in 2016. In 2017, the range of positive discretionary accrual changed slightly to 0.031100. The extent of discretionary negative accrual has changed in the individual years 2015 - 2017, but in all three years, it reached a higher level than the scope of discretionary positive accrual and therefore, according to the scope of earnings management, companies manipulate their earnings by reducing it. Taking into account the average range of discretionary accruals, we can see that the range of non-discretionary negative accruals is higher than the average range of discretionary accruals, with the result that businesses in our analyzed sample in 2015-2017 manipulate earnings by reducing it.

#### 4. Conclusions

This paper was focused on verifying the existence of earnings management in the Slovak Republic by applying the model of Teoh, Welch, and Wong. We used the discretionary accrual and its estimation as the first way to apply this model, we further verified the existence of earnings management using the non-parametric Mann Whitney test and finally, we determined the direction, level and extent of earnings management in the Slovak Republic. The final finding was that the companies in our analyzed sample in the conditions of the Slovak Republic manipulate the earnings downwards, ie by decreasing it in all three years of the monitored period 2015 -2017. The aim of our research was fulfilled, as the results of the research confirmed the existence of earnings management in Slovak companies, which further enabled us to find out the extent, degree and direction of earnings management in the Slovak Republic. The reasons for the implementation of earnings management and their impacts on companies in the Slovak Republic are the subject of future research.

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## References

- Beneish D. Messod. 1999. The Detection of Earnings Manipulation. *Financial Analysts Journal*: 55, 24–36. <https://doi.org/10.2469/faj.v55.n5.2296>.
- Bešlić Ivana, Bešlić Dragana, Jakšić Dejan, and Andrić Mirko. 2015. Testing the Models for Detection of Earnings Management. *Industrija*: 43, 56–76. <https://doi.org/10.5937/industrija43-8035>.
- Burgstahler David, and Dichev Iliia. 1997. Earnings management to avoid earnings decreases and losses. *Journal of Accounting and Economics*: 24, 99–126. [https://doi.org/10.1016/S0165-4101\(97\)00017-7](https://doi.org/10.1016/S0165-4101(97)00017-7).
- Callao Susana, Jarne I. José, and Wróblewski David. 2014. Debates and studies on earnings management: a geographical perspective. *Theoretical Journal of Accounting*: 75, 145–169. <https://doi.org/10.5604/16414381.1098803>.
- Cupertino M. César, Martínez L. Antonio, and Costa C.A. Newton. 2015. Earnings manipulations by real activities management and investors' perceptions. *Research in International Business and Finance*: 34, 309–323. <https://doi.org/10.1016/j.ribaf.2015.02.015>.
- Dechow M. Patricia. 1994. Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics*: 18, 3–42. [https://doi.org/10.1016/0165-4101\(94\)90016-7](https://doi.org/10.1016/0165-4101(94)90016-7).
- Dechow M. Patricia, and Skinner J. Douglas. 2000. Earnings Management: Reconciling the Views of Accounting Academics, Practitioners, and Regulators. *Accounting Horizons*: 14, 235–250. <https://doi.org/10.2308/acch.2000.14.2.235>.
- Di Hui, and Marciukaityte Dalia. 2015. Earnings Smoothing around Open-Market Share Repurchases. *Review of Accounting and Finance*: 14, 64–80. <https://doi.org/10.1108/RAF-10-2012-0111>.
- Chang Hai-Yen, Liang Li-Heng, and Yu Hui-Fun. 2019. Market Power, Competition and Earnings Management: Accrual-based Activities. *Journal of Financial Economic Policy*: 11, 368–384. <https://doi.org/10.1108/JFEP-08-2018-0108>.
- Jakoubek Jiri. 2012. Aspects of Intangible Property Valuation in Intra-group Financial Management. Paper presented at the 6th International Scientific Conference on Managing and Modelling of Financial Risks, Ostrava, Czech Republic, September 10–11, pp. 277–289. Available online: [https://apps.webofknowledge.com/full\\_record.do?product=WOS&search\\_mode=GeneralSearch&qid=7&SID=E2wsGxze8XXhDzMSDDL&page=1&doc=1](https://apps.webofknowledge.com/full_record.do?product=WOS&search_mode=GeneralSearch&qid=7&SID=E2wsGxze8XXhDzMSDDL&page=1&doc=1) (accessed on 10 December 2019).
- Linck S. James, Netter Jeffrey, and Shu Tao. 2013. Can Managers Use Discretionary Accruals to Ease Financial Constraints? Evidence from Discretionary Accruals Prior to Investment. *The Accounting Review*: 88, 2117–2143. <https://doi.org/10.2308/accr-50537>.
- Shahzad Ahmed. 2016. Detecting Earning Management and Earning Manipulation in BRIC Countries; a Panel Data Analysis for Post Global Financial Crisis Period. *International Journal of Accounting Research*: 4, 1–10. <https://doi.org/10.4172/ijar.1000134>.
- Siekelova Anna, Kollar Boris, and Weisssova Ivana. 2015. Impact of credit risk management. *Procedia Economics and Finance*: 26, 325–331. [https://doi.org/10.1016/S2212-5671\(15\)00860-6](https://doi.org/10.1016/S2212-5671(15)00860-6).
- Siregar V. Sylvia, and Utama Sidharta. 2008. Type of earnings management and the effect of ownership structure, firm size, and corporate-governance practices: Evidence from Indonesia. *The International Journal of Accounting*: 43, 1–27. <https://doi.org/10.1016/j.intacc.2008.01.001>.
- Sosnowski Tomasz. 2017. Earnings management and the floatation structure: empirical evidence from Polish IPOs. *Equilibrium – Quarterly Journal of Economics and Economic Policy*: 12, 693–709. <https://doi.org/10.24136/eq.v12i4.36>.
- Šuleř Petr. 2017. Using Kohonen's neural networks to identify the bankruptcy of enterprises: Case study based on construction companies in South Bohemian region. Paper presented at the 5th International Conference Innovation Management, Entrepreneurship and Sustainability (IMES), Praha, Czech Republic, May 25–26, pp. 985–995. Available online: [https://apps.webofknowledge.com/full\\_record.do?product=WOS&search\\_mode=GeneralSearch&qid=6&SID=C1dmt9uQHdEkDeiMKdT&page=1&doc=1](https://apps.webofknowledge.com/full_record.do?product=WOS&search_mode=GeneralSearch&qid=6&SID=C1dmt9uQHdEkDeiMKdT&page=1&doc=1) (accessed on 10 December 2019).

- Valaskova Katarina, Kliestik Tomas, and Kovacova Maria. 2018a. Management of financial risks in Slovak enterprises using regression analysis. *Oeconomia Copernicana*: 9, 105–121. <https://doi.org/10.24136/oc.2018.006>.
- Valaskova Katarina, Kliestik Tomas, Svabova Lucia, and Adamko Peter. 2018b. Financial Risk Measurement and Prediction Modelling for Sustainable Development of Business Entities Using Regression Analysis. *Sustainability*: 10, 2–12. <https://doi.org/10.3390/su10072144>.
- Wawryszuk-Misztal Anna. 2017. Earnings forecasts errors in prospectuses: evidence from initial public offerings on the Warsaw Stock Exchange. *Equilibrium – Quarterly Journal of Economics and Economic Policy*: 12, 229–243. <https://doi.org/10.24136/eq.v12i2.12>.
- Weissova Ivana, Kollar Boris, and Siekelova Anna. 2015. Rating as a useful tool for credit risk management. *Procedia Economics and Finance*: 26, 278–285. [https://doi.org/10.1016/S2212-5671\(15\)00853-9](https://doi.org/10.1016/S2212-5671(15)00853-9).