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CORPORATE DEBT AND EARNINGS MANAGEMENT: EVIDENCE FROM SLOVAKIA

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Abstract. Several different models have been developed worldwide to detect manipulative financial reporting in enterprises. These earnings management practices help enterprises improve their financial performance or gain some advantages based on window dressing techniques. Moreover, there are several firm-specific factors and indicators that can influence the earnings management behavior of enterprises. The purpose of this paper is to test the relationship between corporate debt and earnings management in a sample of 15,716 Slovak firms over a 5-year period. The level of earnings management is measured by discretionary accruals using the Kasznik model, the debt of enterprises is quantified by several indicators (total indebtedness ratio, self-financing ratio, current and non-current indebtedness ratios, equity leverage ratio, and insolvency ratio). In this paper, a correlation analysis and an ANOVA method were applied to show if there is any statistically significant dependence between the level of discretionary accruals and corporate debt. The results indicate a positive relationship between the level of discretionary accruals and total indebtedness, non-current indebtedness, and insolvency ratios, while a negative relationship was revealed for self-financing and current indebtedness ratios.

Keywords: debt financing, corporate debt, earnings management, discretionary accruals, Kasznik model.

JEL Classification: C52, D22, G32, L25, M41.

Introduction

Earnings management is the selection of accounting policies or appropriate measures that affect corporate revenues in order to achieve certain profit objectives reported in the financial statements (Darmawan et al., 2019). Ronen and Yaari (2008) provided a general definition of earnings management that focuses on the goal of managing the impact of reported earnings, including intentional measures to affect reported revenue and its interpretation. The authors also distinguished between two main activities of earnings manipulation in a real economic and accrual way. Dechow and Skinner (2000) defined other groups of earnings manipulation practices considering whether or not the use of earnings manipulation practices complies with GAAP principles. If the GAAP principles are violated, earnings management is used for fraud, revenues are used in accounting before they are created, and inventories are artificially increased by the company accounting for fictitious inventories (Hlawiczka et al., 2021; Aliyev, 2021). If the GAAP standards are in line with the enterprise, some accounting practices may be determined: i) conservative accounting, where costs are overestimated in the context of asset depreciation, resulting in underestimated conservative earnings; ii) neutral accounting if earnings management is not used and published results are not artificially modified; iii) aggressive accounting with drawing on reserves or provisions, underestimation of bad debts, resulting in overestimated aggressive profit.

Following different types of earnings manipulation in enterprises, the main aim of the paper was to reveal the relationship between corporate debt and earnings management behavior using a sample of 15,716 Slovak enterprises with total assets of at least € 300,000 over a 5-year period (2015–2019). The motivation of the study was to analyse the situation in Slovakia following other research mapping the relationship between debt financing and earnings management practices (e.g. Rodriguez-Perez & van Hemmen, 2010; Franz et al.,

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2014; Dhole et al., 2016; Orazalin & Akhmetzhanov, 2019; or Ghorbani & Salehi, 2021). The study does not include the years affected by the COVID-19 pandemic, as the results could be misrepresented. The level of earnings management was measured by discretionary accruals using the Kasznik model (1999).The debt of enterprises is quantified by several indicators (total indebtedness ratio, self-financing ratio, current and non-current indebtedness ratios, equity leverage ratio, and insolvency ratio). The application of the Kasznik model proved successful in several studies (e.g. Veronica & Bachtiar, 2005; Merdani et al., 2020). Beslic et al. (2015) applied models for earnings management detection in the Serbian economic environment, declaring the best explanatory power of this model in the industrial sector. Nazir and Afza (2018) used the Kasznik model to report the relationship between corporate governance, firm value, and manipulation of reported earnings.

The paper is divided as follows: theoretical background, which summarizes the most relevant and up-to-date research in the field. The data and methodology section determines the sample of analyzed enterprises and the methodological steps of the research. The results and discussion section proffers the results of the correlation and ANOVA analyses, showing statistically significant differences between the levels of discretionary accruals (a type of earnings management practice) and corporate debt. The findings are discussed and argued in the context of other international studies. The conclusion section underlines the crucial findings, limitations, and further challenges of the research.

1. Brief theoretical background

As indicated in different studies (e.g. Hudakova et al., 2021; Valaskova et al., 2021; Sosnowski, 2021; Kovacova & Lazaroiu, 2021), enterprises tend to manipulate their financial reports due to financial problems, indebtedness issues, and credit risks that may affect their sovereignty, competitive advantage, financial stability, or reputation. The interconnection between corporate debt and earnings manipulation has been of interest of different authors worldwide. Trung et al. (2020) revealed the relationship between short-term debt and accrual-based earnings management on a sample of Vietnamese enterprises over a 7-year horizon. They provided evidence that short-term debt maturity decreases earnings management practices at low levels of short-term debt, while earnings manipulation increases at high levels, demonstrating a U-shaped relationship. The same findings were discussed by Barua et al. (2022) or Bhutta et al. (2021) that short-term debt moderates the relationship between earnings management behavior and investment efficiency. Mendoza et al. (2021) broadened the previous findings and claimed that leverage and short-term debt affect earnings management practices negatively and nonlinearly. Nonlinearity suggests that positive discretionary accruals are typical of enterprises with high levels of leverage and short-term debt. The research by Durana et al. (2021) and Michalkova et al. (2021) under Slovak and Czech conditions highlighted the previous findings that manipulation with earnings has a negative impact on short-term debt, since the higher the indebtedness level, the higher the demands for quality accounting profits. Thanh et al. (2020) investigated the bonds between the debt ratio and earnings management, declaring a positive effect in low debt regimes and a negative effect in high debt regimes. The research of Maurice et al. (2020) on a sample of 17 European countries confirmed that enterprises with high earnings management activities have less long-term debt and that this relationship is hold especially in countries with weak creditor rights. Ghorbani and Salehi (2021) documented on a sample of 200 enterprises listed on the Tehran Stock Exchange that higher levels of income smoothing and discretionary accruals stand for higher financial leverage. Dang et al. (2021) confirmed this finding by showing that the higher the earnings manipulation activities, the greater the firm leverage ratios. Investigating external debt financing in 43 countries, Zhang and Xu (2020) and Thang et al. (2020) declared that accrual-based earnings management practices are positively related to firms' reliance on external financial sources.

2. Data and methodology

The Orbis database (supported by Bureu Van Dijk, a Moody's Analytics Company), was used to form a dataset of 17,992 enterprises operating in the Slovak Republic. The selected companies met the condition that the value of their total assets was at least € 300,000 in the period under review to ensure that all enterprises in the dataset are in stable financial positions and have a similar economic background. The final sample, after the removal of not available and outlying values, consists of 15,716 enterprises (all the companies were represented in the five analysed years). It should be emphasized that the sample represented a representative sample of enterprises, which was used to calculate both discretionary accruals and indebtedness ratios. In the following table (Table 1), it is possible to see the individual representation of enterprises in the categories of firm size, NACE classification, legal form, and number of years of operation in the market.

Within the size representation, companies are divided into four groups: small (32%), medium-sized (55%), large (12%) and very large (1%). Most enterprises operate in the category G – Wholesale and retail trade; repair of motor vehicles and motorcycles. This category got to the first place, as the Slovak Republic is known as a country of car production. Their subsequent sale and provision of service is closely related to the production of cars. By contrast, the fewest enterprises in the sample

Table 1. Firm-specific features of the sample

COUNTRY	SK
LEGAL FORM AND OWNERSHIP STRUCTURE	%
Private limited companies	82.14
Public limited companies	13.57
Partnerships	4.12
Other legal forms	0.17
FIRM AGE (years)	%
<10	6.3
10–20	45.5
20–30	45.6
30–40	0.4
40–50	1.9
50–60	0.0
60–70	0.3
>70	0.0
ECONOMIC SECTOR (NACE CLASSIFICATION)	%
A. Agriculture, forestry and fishing	6.54
B. Mining and quarrying	0.31
C. Manufacturing	15.52
D. Electricity, gas, steam and air conditioning supply	1.98
E. Water supply; sewerage, waste management, etc.	0.96
F. Construction	6.78
G. Wholesale and retail trade, repair of motor vehicles/motorcycles	25.68
H. Transportation and storage	4.65
I. Accommodation and food service activities	2.28
J. Information and communication	2.90
K. Financial and insurance activities	0.48
L. Real estate activities	12.82
M. Professional, scientific and service activities	10.32
N. Administrative and support service activities	6.18
O. Public administration and defence; compulsory social security	0.04
P. Education	0.34
Q. Human health and social work activities	0.97
R. Arts, entertainment and recreation	0.93
S. Other service activities	0.32

are in category O – Public administration and defence; compulsory social security.

According to the legal form, the most represented are private limited companies. This type of legal form is the most widespread due to its simple establishment (it can be established by an individual, but not more than 50 individuals), relatively low share of capital (5,000 euros), and limited liability by the company's assets or unpaid shareholders' contributions. The second most common legal form in the data set is a public limited company. The company can be established by either two natural persons or one legal entity, the registered capital is 25,000 € and liability is limited by the value of corporate assets.

The last division is the number of years on the market. It is obvious that enterprises with the shortest operations in the market have the smallest share (3–5 years). As enterprises with a market presence of more than 5 years predominate, it can be said that these enterprises are sufficiently stable and will provide ideal data for the research.

To meet the main aim of the paper, the following hypotheses were set:

- H1: The correlation between the discretionary accruals (DA) and indebtedness ratios values is statistically significant, the variables are linearly dependent.
- H2: There are statistically significant differences in the level of indebtedness ratios across different earnings management practices (conservative, neutral, and aggressive accounting) measured by discretionary accruals.

The research was realized in several methodological steps:

1. Discretionary accruals in the dataset were calculated based on the Kasznik model (1999), who modified the Jones model and added the annual change of cash flows as a relevant parameter, Eq. (1).

$$\frac{NDA_{it}}{A_{it-1}} = \frac{TA_{it}}{A_{it-1}} = \alpha_0 \frac{1}{A_{it-1}} + \alpha_1 \frac{\Delta REV_{it}}{A_{it-1}} + \alpha_2 \frac{PPE_{it}}{A_{it-1}} + \alpha_3 \frac{\Delta CFO_{it}}{A_{it-1}} + \varepsilon_{it}, \quad (1)$$

where: NDA_{it} – non-discretionary accrual in a year t; TA_{it} – total accrual in a year t; A_{it-1} – total assets in a year $t-1$; ΔREV_{it} – annual change of revenues in a year t; PPE_{it} – long-term tangible assets in a year t; ΔCFO_{it} – annual change of operating CF in a year t; α_0, α_1, α_2, α_3 – regression coefficients; i – firm index, $i = 1, 2, ..., N$; t – period index, $t = 1, 2, ..., T$; ε_{it} – prediction error.

2. One sample t-test was run each year to determine whether the mean values of discretionary accruals were other than zero. If the mean value of discretionary accruals is not different from zero, there is a sign of neutral accounting practice. However, if the mean value is different from zero, its positive value stands for aggressive earnings management behavior, while the negative one stands for conservative accounting activities.

3. The indebtedness ratios were calculated for each enterprise in a dataset and for each analyzed year. The descriptive statistics of the indebtedness ratios used in the analysis are presented in Table 2.

4. The correlation coefficients and their statistical significance were computed to describe the positive and negative relationships between discretionary accruals and individual indebtedness ratios.

5. To test if the indebtedness ratios are different considering the specific type of earnings management activities (aggressive, neutral, conservative), the non-parametric Kruskal-Wallis test was used (the normality of the dataset was not confirmed). If the indebtedness ratio

Table 2. Descriptive statistics of analysed indebtedness ratios (5-year average values)

	mean	med.	st.dev	min	max	coef. var.
TI	0.6353	0.6547	0.3737	−0.0169	3.7872	0.5882
SF	0.3647	0.3453	0.3737	−2.7872	1.0169	1.0245
CI	0.4553	0.4147	0.3379	−0.0478	3.4797	0.7422
NCI	0.1800	0.0595	0.2726	−0.0180	1.9905	1.5146
EL	6.2622	2.6811	29.946	−54.832	429.596	4.7820
INS	2.7943	1.8417	2.6864	−0.2018	17.4097	0.9614

Note: TI total indebtedness ratio, SF self-financing ratio, CI current indebtedness ratio, NCI non-current indebtedness ratio, EL equity leverage ratio, INS insolvency ratio.

was not the same across earnings management activities, confirming the relationship between indebtedness and earnings management, the differences in pairs of groups were identified by Dunn-Bonferroni post hoc tests.

3. Results and discussion

The results of the correlation analysis proved that in almost all cases, the correlation between the parameters is statistically significant (except for the equity leverage ratio). The values of the Pearson correlation indicate that there is a weak association between the parameters, Table 3.

Table 3. Correlation analysis

		TI	SF	CI	NCI	EL	INS
DA	Pearson Correl.	0.031	−0.031	0.040	−0.097	0.015	0.018
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.056	0.029
	N	15,716	15,716	15,716	15,716	15,716	15,716

The outputs of the correlation analysis connote a positive relationship between the level of discretionary accruals and the total indebtedness, current indebtedness, and insolvency ratios. It means, that the higher these indebtedness ratios, the higher the values of the discretionary accruals (toward aggressive accounting practices). As stated by Teoh et al. (1998), aggressive methods are applied when enterprises need to reduce risks and costs related to all regal regulations and make borrowing possibilities sustainable.

A positive association between debt level and earnings management was shown by Kim and Lee (2015), who showed on a sample of Korean enterprises, that a high debt dependency level indicates aggressive pursuit of accrual-based earnings management. A negative relationship was revealed for the self-financing and non-current indebtedness ratios. Thus, the higher the level of these ratios, the lower the values of discretionary accruals (towards neutral or conservative accounting). This finding may be confirmed by other relevant studies which declare a positive relationship between debt level and earnings management (e.g., Jang & Kim, 2017; Sincerre et al., 2016; Sercu et al., 2006), indicating that high-leverage enterprises tend to manage earnings upwards. Similarly to this study, Fung and Goodwin (2013) also confirmed that current indebtedness is positively associated with earnings management measured by discretionary accruals. A positive association between earnings management and leverage in old-economy enterprises was also demonstrated in the study by Jones and Sharma (2001). The statistically significant impact of current liabilities on accrual earnings management was found by Park (2016), noting that managers use this kind of accrual-based manipulation when they face liquidity risks from short-term debts.

Maurice et al. (2020) affirmed the link between high earnings management practices and less long-term debt, which is also typical for enterprises in the analyzed sample of Slovak enterprises. It should be stressed that the negative bond between earnings manipulation and non-current indebtedness is held in countries with insufficient creditor rights. The research study by Rey et al. (2020) observed a negative link between earnings manipulation and the proportion of long-term debt in total debt.

To determine the statistically significant differences in the level of indebtedness ratios across different earnings management practices (conservative, neutral, and aggressive accounting) measured by discretionary accruals. Specific accounting practices were determined based on the level of discretionary accruals calculated by the Kasznik model: a positive discretionary accrual stands for aggressive earnings management, a negative accrual for conservative earnings management, and neutral accounting in which the values of discretionary accruals are not significantly different from zero (Amara, 2017). The one-way ANOVA method was applied to test whether samples originated from the same distribution. Normality was not confirmed in the dataset, thus, the non-parametric Kruskal-Wallis test was run to find at least one sample that stochastically dominates another sample. A Dunn-Bonferroni correction test was used to analyse the sample pairs for stochastic dominance (pairwise comparison). The results are summarized in Table 4.

The outputs indicate that there are significant differences in the values of indebtedness ratios across different accounting practices (except for the non-current indebtedness ratio, where the median values are the same in all categories of earnings management). The use of post-hoc tests, with the significance values adjusted by the Bonferroni correction for multiple tests, enabled comparing the differences in the categories of discretionary accruals (Table 5).

Total indebtedness ratio and the self-financing ratio are related because they provide similar information about debt policy. The self-financing ratio notes the percentage of total assets covered by equity, while the total indebtedness ratio measures the ratio of debt to total

Table 4. Kruskal-Wallis test

Hypothesis Test Summary				
	Null Hypothesis	Test	Sig.	Decision
1	The distribution of TI is the same across categories of DA	Independent-Samples Kruskal-Wallis Test	0.006	Reject the null hypothesis.
2	The distribution of SF is the same across the categories of DA	Independent-Samples Kruskal-Wallis Test	0.006	Reject the null hypothesis.
3	The distribution of CI is the same across categories of DA	Independent-Samples Kruskal-Wallis Test	0.000	Reject the null hypothesis.
4	The distribution of NCI is the same across categories of DA	Independent-Samples Kruskal-Wallis Test	0.777	Retain the null hypothesis.
5	The distribution of EL is the same across categories of DA	Independent-Samples Kruskal-Wallis Test	0.000	Reject the null hypothesis.
6	The distribution of INS is the same across the categories of DA	Independent-Samples Kruskal-Wallis Test	0.000	Reject the null hypothesis.

Tables 5. Pairwise comparison of discretionary accruals

Ratio	Sample 1–Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
TI	zero–negative	−116.734	113.130	−1.032	0.302	0.906
	zero–positive	297.368	104.976	2.833	0.005	0.014
	negative–positive	180.635	81.595	2.214	0.027	0.081
SF	positive–negative	−180.120	81.595	−2.207	0.027	0.082
	positive–zero	−297.461	104.976	−2.834	0.005	0.014
	negative–zero	117.341	113.130	1.037	0.300	0.899
CI	positive–zero	−647.965	104.976	−6.173	0.000	0.000
	positive–negative	−986.429	81.595	−12.089	0.000	0.000
	zero–negative	−338.464	113.130	−2.992	0.003	0.008
EL	positive–zero	−362.312	104.976	−3.451	0.001	0.002
	positive–negative	−597.105	81.595	−7.318	0.000	0.000
	zero–negative	−234.793	113.130	−2.075	0.038	0.114
INS	negative–zero	269.879	109.703	2.460	0.014	0.052
	negative–positive	2,048.46	79.684	25.707	0.000	0.000
	zero–positive	1,778.58	102.296	17.387	0.000	0.000

assets. And as evident, the pairwise comparison brought identical results as significant differences in the values of these ratios are between zero and positive discretionary accruals, i.e., neutral and aggressive earnings management.

The average median value of total indebtedness in neutral accounting was 0.639 (compared to 0.657 in aggressive accounting). However, in both cases, it is within the optimal values. Similarly to previous studies (Alzoubi & Saleem, 2018; Fields et al., 2018; Zhang & Xu, 2020), the higher the proportion of debt on total assets, the more significant the manipulations of enterprises to show financial stability to their investors and business partners. The comparison of average mean values of the self-financing ratio reveals higher values for neutral accounting (0.361) than for the aggressive one (0.348). This finding is in contrast with the studies by Hussain et al. (2020) and Lazzem and Jilani (2018), who declared a negative linkage between the self-financing ratio and accrual earnings management.

Analyzing the equity leverage and insolvency ratios, significant differences were detected between positive and zero, positive and negative discretionary accruals. Their average median values are shown in Table 6.

Growing values of the insolvency ratio indicate problems with primary insolvency, corporate revenues decrease, additional costs related to fees from contracts and interest rates increase, and the reputation of an enterprise is jeopardized. An enterprise becomes an unsuitable partner for its potential creditors, and there is also a

Table 6. Average median values

Ratio / Median	Positive	Zero	Negative
EL	2.349	2.565	2.689
INS	7.224	3.195	2.854

risk of financial distress (Kaczmarek et al., 2021; Krulicky & Horak, 2021). Enterprises tend to hide their financial problems and improve debt-to-equity ratios by aggressive accounting methods (Uyar, 2014; Tosun & Senbet, 2020). The differences in the median values detected in the pairwise comparison are the proof. The equity leverage ratio quantifies the total corporate liabilities to shareholder equity. Higher values of this ratio indicate higher risks to shareholders (Kljucnikov & Belas, 2016; Crişan-Mitra et al., 2020) and more aggressive activities of enterprises in financing their growth with debt, which can result in volatile earnings as a consequence of additional interest expenses and increase chances of bankruptcy (Karas & Reznakova, 2021).

Finally, the values of the current indebtedness ratio differ across all categories of discretionary accruals;the median values of this ratio are significantly different when comparing the positive (0.393), zero (0.457), and negative (0.478) accrual values. The results prove the importance of this ratio in earnings management practices: current debts induce greater earnings manipulation. The same outputs were confirmed by Gupta et al. (2008), who recorded on data from 33 countries over a 10-year period, that current debt creates an incentive for borrowers to postpone the recognition of bad financial news through earnings manipulation. Mendoza et al. (2021) analyzed the effects of financial policy on earnings management on a sample of Latin American enterprises. They observed a negative and non-linear effect of short-term debt on earnings management practice, confirming that enterprises with high levels of current debt carry out positive discretionary accruals. And vice versa, as stated by Michalkova et al. (2021), accounting manipulation has a negative impact on short-term debts due to debt holders' demand for quality accounting profit.

The recent study by Poretti et al. (2020) shows how various debt levels influence the quality of corporate earnings. The research was performed on a sample of large enterprises from 26 countries over a 15-year horizon and demonstrated that the higher the financial leverage, the lower the earnings management activities in conditions with strong investors protection. Thus, it could be stated, that a certain level of debt may act as a useful tool for corporate managers due to in-depth financial monitoring by financial institutions, which forces managers to report true economic reality.

Conclusions

On the basis of the previous findings and suppositions in the literature on earnings management, the main aim of this study was to test and describe the relationship between corporate debt and earnings management on a sample of 15,716 Slovak enterprises over a 5-year period. The research used discretionary accruals as a determinant of earnings management behaviors, derived from the Kasznik model. The results indicate that there are significant differences in the level of specific indebtedness ratios across the categories of discretionary accruals (positive, zero, and negative) and that the mutual relation between discretionary accruals and indebtedness ratios may be positively (total indebtedness, current indebtedness, and insolvency ratios) or negatively (self-financing and non-current indebtedness ratios) correlated. Thus, investors should be careful when considering the performance of enterprises based on their financial results measured by their indebtedness ratio to avoid enterprises whose weak financial results are hidden by earnings manipulation activities. The outputs of the analysis reveal interesting findings that correspond with other studies published worldwide, despite the fact that the study is limited only to one country and to a specific period. However, in mapping the earnings management phenomenon, the research focus on a specific country is more felicitous due to different economic, political, and social patterns as well as particular legislative and legal standards applied into national conditions. The spatial and time limitations of this study will be eliminated in future research by applying advanced statistical methods, panel data analysis, which allows multiple observations on each sampling unit.

Obviously, debt financing is an attractive alternative for enterprises to finance their activities. However, if the balance sheet is weaker, there is a risk of potential distress. In addition, the level of corporate debt should be carefully considered by managers, as higher leverage can influence earnings, which usually reflect actual corporate performance. To maintain the attractiveness and competitiveness of enterprises on the market, managers have various motivations (aggressive or conservative) to disclose earnings, which are window-dressed to impact relations with financial institutions, stakeholders, and business partners.

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Contribution

Both authors contributed equally to this manuscript. All authors have read and agreed to the published version of the manuscript.

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