
DISCRETIONARY CAPITALIZATION OF DEVELOPMENT EXPENDITURES

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Abstract: *The paper examines the discretionary nature of (non)capitalizing development expenditures in financial statements. A review of the literature shows that companies may have different motives and factors for (non)capitalizing development expenditures. This study analyzes a sample of 547 companies from the information and communications technology (ICT) sector listed on the Frankfurt Stock Exchange in the period 2009-2018. The ICT sector was selected because it represents an industry with high R&D (research and development) expenditures. The results of the probit regression analysis made on 3,718 observations show that the capitalization of development expenditures is significantly positively related to the size and return on assets of the firm and negatively related to the age of the firm. Larger and more profitable firms are more likely to capitalize development expenditures, while older firms are less likely to capitalize development expenditures. Our results contribute to the literature in the field of*

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positive accounting theory providing additional insights into factors associated with decisions to (non)capitalize development expenditures.

Keywords: *capitalization / development expenditures / discretion / incentives / intangible assets.*

INTRODUCTION

In recent decades, the composition of corporate assets has changed significantly. Intangible assets have become increasingly important compared to tangible assets. To this end, information on the value of intangible fixed assets is important for a wide variety of stakeholders, from users of financial statements, investors and more broadly to standard setters at the global level (Mazzi et al., 2019). However, in accordance with accounting standards, only a limited portion of intangible assets can be recognized in financial statements. A large proportion of internally generated intangible assets do not meet the conditions for recognition, which means that they are not shown in a company's financial statements.

In developed countries, investments in research and development usually amount to 3-4% of the GDP. Research and development are an important factor in the growth of businesses, economies, and standards of living (Lev et al., 2008). However, intangible assets arising from research cannot be recognized as assets in financial statements. Expenditure on research must be recognized as an expense in the income statement when it is incurred (IAS, 38.54). As per accounting standards, an entity cannot demonstrate in the research phase the existence of the probable future economic benefit of an intangible asset. On the other hand, an intangible asset arising from a development phase may be recognized as an asset in the financial statements if it meets the conditions set out in International Accounting Standard 38 (IAS, 38). If this type of intangible asset does not meet the conditions for recognition, it is immediately expensed.

So, at least technically, the (non)capitalization of development expenditures is not subject to management's preferences. However, from the perspective of accounting standards users, considerable judgment is required to determine whether the prescribed conditions for capitalizing development expenditures as assets are met (Mazzi et al., 2019). Companies usually have internal motives that direct them to

(non)capitalize their research and development expenditures (Kong & Huaitao, 2019). The decision to (non)capitalize affects the amount of profit or loss for the period and, consequently, the various indicators based on which the company's performance (see Janeš, 2014, for more detail) is assessed. Managerial judgment does not necessarily lead to managerial opportunism, but different solutions in accounting standards allows managers to choose a more favourable alternative for each situation that arises, thus acting opportunistically (Emudainohwo, 2021).

Studies have already confirmed the relevance of capitalized development expenditures in setting market prices for firms (Aboody & Lev, 1998; Smith et al., 2001; Callimaci & Landry, 2004; Ke et al., 2004; Kamran & Falk, 2006; Napoli, 2015). The latter depends, among other things, on capitalized research and development expenditures which offer investors important information about the company's development potential. The aim of our analysis is to determine what motives and factors influence the decision to (non)capitalize development expenditures and whether management uses discretionary decisions based on accounting standards to act opportunistically. We will focus our analysis on companies operating in the information and communications technology (ICT) sector, as one of the economic sectors with the largest proportion of R&D expenditures. We use probit regression analysis to test the hypotheses.

The structure of the paper is as follows. The theoretical background of the research explains the motives and factors that influence the decision to (non)capitalize development expenditures. The development of the hypotheses is presented in the third chapter, while the fourth part describes the data and the methodology used. The results of the empirical analysis and the discussion follow in the fifth chapter. Concluding remarks are presented in the sixth part.

LITERATURE REVIEW

The influence of management on the initial recognition and subsequent measurement of accounting categories in financial statements is a topic that has been explored more intensively within positive accounting theory (Watts and Zimmerman, 1986). Based on positive accounting theory, which emphasizes the importance of accounting income (profit or loss) in the context of management opportunism, research on earnings management began to develop. The redistribution of income from period

to period is not fraudulent reporting, but the choice of accounting methods (as part of a set of methods allowed by accounting standards) allows managerial discretion in redistributing/adjusting profit or loss for external reporting purposes (Zang, 2012).

According to the literature, opinions on the capitalization of development expenditures are divided. Proponents of capitalization believe that development funds are long-term and affect the company's future profitability (Markarian et al., 2008) and that they should be capitalized as such. On the other hand, some support the immediate recording of this expenditure as a cost, as they believe that capitalization requires subjective judgment and increases the scope of opportunistic reporting (Nixon, 1997). If management has the ability to capitalize development expenditures, it may provide more reliable information on development projects to external users of financial statements but may not disclose such information if it uses capitalization to manage earnings. Finally, avoiding capitalization may be the result of unreliable estimates of the future benefits of these assets (Mohd, 2005).

Previous studies examining the influence of motives and factors on the capitalization of development expenditures include Aboody and Lev (1998), Percy (2000), Landry and Callimaci (2003), Mohd (2005), Cazavan-Jeny and Jeanjean (2006), Tutticci et al. (2007), Markarian et al. (2008), Prencipe et al. (2008), Oswald (2008), Ciftci (2010), Cazavan-Jeny et al. (2011), Zicke (2014), Dinh et al. (2016), Mazzi et al. (2019), and Oswald et al. (2019). The research in accounting treatment of development expenditures has highlighted several motivations and factors that influence the capitalization of these expenditures. The most pertinent are presented below.

MOTIVES AND FACTORS INFLUENCING THE CAPITALIZATION OF DEVELOPMENT EXPENDITURES

Corporate leverage

Corporate leverage is expected to have a positive effect on the capitalization of development expenditures (Aboody & Lev, 1998; Landry & Callimaci, 2003; Oswald, 2008; Mazzi et al. 2019). The higher a firm's debt, the greater its tendency to capitalize development expenditures.

Landry and Callimaci (2003) conducted a survey of data from 1997 to 1999. The survey was conducted on a sample of 434 observations for Canadian companies in the biotechnology/pharmaceutical, computer hardware, software, and electronics sectors. The results of their study show that Canadian companies in the software industry follow U.S. accounting practices in recording development expenditures. The authors find that more leveraged companies capitalized more development expenditures. It is argued that this phenomenon is related to earnings management. In their study, earnings management is reflected in the fulfilment of debt obligations and income smoothing.

Mazzi et al. (2019) examined a sample of data from 2006 to 2015 for countries that harmonized their standards with IFRS (International Financial Reporting Standards) during this period. 20,475 observations were included in their analysis. The authors find that more indebted companies are more likely to capitalize development expenditures and that companies that capitalize development expenditures pay more attention to research and development expenditures in their annual reports. The results of this study indicate that investors are interested in the total amount of research and development expenditures (and not just the capitalized portion).

Company size

The influence of company size is found as negatively related to the capitalization of development expenditures. The larger the company, the lower the expected development assets. This relationship was confirmed by El-Sayed (1985), Aboody and Lev (1998), Landry and Callimaci (2003), Cazavan-Jeny et al. (2011), and Mazzi et al. (2019).

El-Sayed (1985) conducted a survey on a sample of 205 companies based on 1,983 data in the United States. The author confirmed a negative, statistically significant relationship between firm size and capitalization of development expenditures.

Cazavan-Jeny et al. (2011) conducted a survey with data from 1992 to 2001. The survey was performed using a sample of 1,060 observations for French firms listed on the Paris Stock Exchange. The sample is composed of companies that reported development assets in their financial statements during the period of analysis. The authors find that the decision to capitalize

development expenditures is associated with a (slightly) negative (statistically insignificant) effect on future operations, suggesting that there is no evidence that managers capitalize development expenditures to disclose information that better informs users of financial statements. The authors find a negative statistically significant relationship between firm size and capitalized development assets.

Aboody and Lev (1998) also found a negative statistically significant relationship between firm size and the volume of annual capitalized development expenditures. Similar results followed in studies by Landry and Callimaci (2003) and Mazzi et al. (2019). Landry and Callimaci (2003) explain these results in terms of political costs (Watts & Zimmerman, 1986). However, Aboody and Lev (1998) point out that large firms are expected to conduct more basic research or maintain and improve their products. They also assert that capitalizing development expenditures should be more important for smaller firms because it should have a greater impact on their financial statements. This statement is also summarized by Cazavan-Jeny et al. (2011) and Mazzi et al. (2019).

Age of the company

In a study of Canadian firms, Landry and Callimaci (2003) found a positive relationship between company's age and capitalized development expenditures. In this study, the age of the company was measured as a binary variable - if the company was older than 5 years (measured from the date of establishment), the variable was 1; otherwise, it was 0. The authors assert that the positive association may be due to proven and established records in older firms. In addition, it should be easier for more mature companies to ensure technical sophistication and better estimates of future benefits. Indeed, these companies rely on their own internal archival data.

The opposite relationship was noted by Oswald et al. (2019), who conducted a survey using data from 2002 to 2011. The survey was performed on a sample of 984 observations for UK companies with research and development activity, which compiled financial statements according to UK GAAP and IFRS. Companies that changed their accounting policy for the treatment of development expenditure - moving from cost

recognition to capitalization - increased development expenditure more than companies that generally capitalized development expenditure. Their results also show that older companies are less likely to capitalize development expenditures.

ROA (Return on assets)

Research has shown that a higher ROA has a negative impact on the capitalization of development expenditures - companies with lower returns are more likely to capitalize development expenditures. Markarian et al. (2008) conducted a survey using data from 2001 to 2003. The survey was conducted using a sample of 130 observations for firms listed on the Milan Stock Exchange. The sample included companies that recorded expenditures on research and development. The results indicate that managers use capitalization of development expenditures to "smooth" profits. The authors bolster their findings with a negative association between the change in returns and the amount of capitalized development expenditure.

Zicke (2014) conducted a survey using data from 2006 to 2010. The survey is based on a sample of 506 observations for companies listed on the Frankfurt Stock Exchange. The sample includes companies that report under IFRS and disclose research and development activities in the notes to the financial statements. The author manually verified this condition in the annual reports. In further analysis, only companies that reported research and development expenditures were included in the sample. The author finds that managers capitalize development expenditures to avoid losses and reduce profits. The research confirms the negative correlation between return on assets and capitalization of development expenditures. More profitable companies capitalize development expenditures less often than less profitable companies. The result is supported by interpretation which indicates that lucrative firms evade capitalization with the intention of showing financial stability. On the other hand, these companies could capitalize more development expenditures as they are expected to have more profitable projects. The research also analysed the purpose of capitalization, which in this case was related to positive information about the company's research and development projects. The author found a positive relationship between the volume of capitalized development expenditures and future revenues.

Avoidance of losses

Avoiding losses is expected to have a positive effect on capitalizing development expenditures. Those firms that would otherwise report a loss without capitalizing development expenditures are more likely to capitalize them. This relationship was confirmed by Zicke (2014). Dinh et al. (2016) found the same association, but it was not statistically significant.

In the academic literature (Burgstahler & Eames, 2006; Mindak et al., 2016), researchers examined past profit generation and analyst-predicted profits in addition to loss avoidance. DeGeorge et al. (1999) argue that there is a hierarchy in profit achievement; first is achieving a positive profit, second is achieving the previous year's profit, and third is achieving the profit expected by analysts.

Other factors

The growth category has been positively associated with capitalization of development expenditures (Dinh et al., 2016; Markarian et al., 2008). However, different methodological approaches have been used. Dinh et al. (2016) conducted a survey using data from 1998 to 2012. The survey is based on a sample of 887 observations for the 150 largest companies on the Frankfurt Stock Exchange that prepared financial statements according to IFRS. The study focuses on the growth in the value of development expenditure over a one-year period. The authors of this study find that companies that need to increase their profits above a certain value (e.g., exceeding analyst forecasts; exceeding past earnings; achieving a positive profit through capitalized development expenditures that would affect profit or loss if immediately recognized as a cost) capitalize significantly more development expenditures. Markarian et al. (2008) examined the impact of potential growth on capitalization of development expenditures. They found a positive correlation with capitalization.

Other factors related to the capitalization of development expenditures have also been tested in the scientific literature. Oswald (2008) tested the variable "stable level of research and development". He found that companies that do not report a stable level of research and development on their books of accounts capitalize more development expenditures.

Prencipe et al. (2008) studied the impact of company ownership on capitalization of development expenditures. Their sample of Italian companies includes family-owned and non-family-owned companies (2001-2003). Their results show that family businesses capitalize less development expenditures than non-family ones. The variable "ROA" and the variable "changes of ROA" have a negative statistically significant association with the extent of capitalized development expenditure in the sample of non-family-owned companies. In the sample of family businesses, the association was not statistically significant. A variable based on ownership was also employed by Percy (2000). Percy (2000) found that subsidiaries not wholly owned by the parent company capitalize more development expenditures than subsidiaries that are wholly owned by the parent company.

Moreover, Mazzi et al. (2019) found that companies with a higher proportion of sales generated in international markets have more development expenditures. A recent Korean study (Kim & Lee, 2020) examined environmentally oriented factors. The authors found a positive relationship between environmental protection implementation strategy and environmental organization with capitalization of development expenditures.

Previous studies analysing motives and factors influencing (non)capitalization decisions have been conducted on samples from North American companies (Aboody & Lev, 1998; Landry & Callimaci, 2003; Mohd, 2005; Ciftci, 2010), Australia (Percy, 2000; Tutticci et al., 2007), France (Cazavan-Jeny & Jeanjean, 2006; Cazavan-Jeny et al., 2011), the United Kingdom (Oswald, 2008; Oswald et al., 2019), Italy (Markarian et al., 2008; Prencipe et al., 2008) and Germany (Zicke, 2014; Dinh et al., 2016).

Since accounting solutions in U.S. GAAP standards differ from those in IFRS standards, the findings cannot be directly transferred to the European environment. In addition to differences in accounting standards, there are differences in accounting practices among various countries due to the characteristics of the institutional environment (Leuz et al., 2003). The key differences between our study and previous studies conducted on samples of publicly quoted companies in Europe relate to the characteristics of the companies in the sample and the sample size. Our study focuses on the ICT industry, which is characterized by high investment in research and development. In studies conducted by Zicke

(2014), Dinh et al. (2016), Markarian et al. (2008), Cazavan-Jeny and Jeanjean (2006), Cazavan-Jeny et al. (2011) different industries are analysed. Some of these studies also included ICT companies, but their number was much smaller than in our sample. In addition to some differences in the model treatment of motives and factors that lead to the (non)capitalization of development expenditures, the period of analysis is also different. Dinh et al. (2016) and Oswald et al. (2019) used a time period that partly coincided with the application of older accounting rules (until 2005), so the results cannot be fully compared with more recent studies. Research by Markarian et al. (2008), Cazavan-Jeny and Jeanjean (2006), Cazavan-Jeny et al. (2011) and Oswald (2008) were conducted using data from the period before 2005.

HYPOTHESES DEVELOPMENT

Leverage is a commonly used variable which has been previously examined in the field of positive accounting theory and associated with management's opportunistic discretion. Watts and Zimmerman (1990) state that higher corporate leverage increases the likelihood that management will choose accounting methods that increase profits. The higher the level of leverage, the more likely it is that a company will breach restrictive covenants and consequently incur costs. Restrictive covenants are therefore expected to lead to management decisions to maximize the profit or loss for the period. It is expected that companies closer to credit constraints are more likely to capitalize development expenditures (Aboody & Lev, 1998; Landry & Callimaci, 2003; Oswald, 2008; Mazzi et al., 2019). Recognition of development expenditures, when they occur, as costs reduces the profit or loss for the period and indirectly affects the value of owners' equity. On the contrary, the capitalization of development expenditures is reflected as an increase of intangible assets in the balance sheet and does not reduce the profit/increase loss. Therefore, in the first hypothesis, we state:

H1: Firms that are more leveraged are more likely to capitalize development expenditures.

In addition to the political costs faced by large firms (Watts & Zimmerman, 1986), a recent study (Mazzi et al., 2019) mentions that large firms

conduct more basic research, maintenance, and upgrades, which should lead to a negative association between firm size and the capitalization of development expenditures. Basic research is related to research expenditures, which are immediately recognized as costs under current accounting standards (IFRS). In addition, maintenance and upgrades are associated with costs in most cases. Previous research (Cazavan-Jeny et al., 2011; Mazzi et al., 2019) has shown that larger companies capitalize development expenditures less frequently. Therefore, our second hypothesis is:

H2: Larger firms are less likely to capitalize development expenditures.

The negative relationship between a firm's age and the capitalization of development expenditures was confirmed by studies done by Tutticci et al. (2007) and Oswald et al. (2019). They found that, on average, older companies are less likely to capitalize development expenditure. The association with development expenditure was also studied by Canadian researchers (Landry & Callimaci, 2003), who reached different conclusions. They found that the age of a firm has a positive influence on the decision to capitalize development expenditures. Since most previous studies concluded that there is a negative relationship between the age of the company and the capitalization of development expenditure we hypothesize:

H3: Older firms are less likely to capitalize development expenditures.

The relationship between firm's profitability and the capitalization of development expenditures was the subject of an analysis by Markarian et al. (2008) and Prencipe et al. (2008). They found that more profitable companies capitalize fewer development assets. This could be explained by management engaging in income smoothing. Therefore, we will test our fourth hypothesis:

H4: More profitable firms are less likely to capitalize development expenditures.

The literature review shows that loss avoidance has received more attention recently in the context of capitalizing development expenditures (Zicke, 2014; Dinh et al., 2016; Oswald et al., 2019). Zicke (2014) finds that loss avoidance has a positive impact on capitalizing development expenditures. To this end, we state:

H5: Companies that would record a loss without capitalizing development assets, are more likely to capitalize development expenditures.

DATA USED AND METHODOLOGY

The study is based on publicly available data from the *Worldscope* database. Data for the period 2009-2018 for selected ICT companies listed on the Frankfurt Stock Exchange are analysed. This stock exchange was selected because it combines the largest number of software and computer companies among European stock exchanges, according to the *Worldscope* database. The analysis includes ICT companies that report in accordance with IFRS (methodological uniformity of the data used). The ICT industry is chosen because it is characterized by high R&D investment, so the question of what motives and factors affect the (non)capitalization of development expenditure is more important than in industries where the share of development expenditure is lower. The initial sample includes 547 firms (4,923 observations). It includes companies from the software sector and the computer and internet services sector.

We made some exclusions in compiling the sample. Double quotations of companies were excluded from the sample (108 observations). In addition, companies with missing data (737 observations) and those with negative owner's equity (200 observations) were excluded. We then excluded the outliers (160 observations). After all eliminations 3,718 observations remained in the sample.

Our dependent variable is a binary variable (it contains the values 0 and 1). If a firm has capitalized development expenditure, the value of the variable is 1 and vice versa. If a company did not capitalize development expenditure, the value of the dependent variable is 0. The same variable has been used in previous research, namely by Landry and Callimaci (2003), Oswald (2008), Cazavan-Jeny et al. (2011), Zicke (2014) and Dinh et al. (2016).

We use probit analysis to test the hypotheses. For statistical testing, the probit regression analysis (Cazavan-Jeny et al., 2011; Zicke, 2014; Dinh et al., 2016) has been most widely used in this scientific field.

The independent variables in the model are the following: an individual firm's leverage, size, age, return on assets, "loss avoidance" variable and type (ICT). The independent variables included in the model are based on the theoretical review of the literature. The designed model is as follows:

$CAPRD_{it} = \beta_0 + \beta_1 LEV_{it} + \beta_2 SIZE_{it} + \beta_3 AGE_{it} + \beta_4 ROA_{it} + \beta_5 LOSS_AVOID_{it} + \beta_6 SOFTW_{it} + \varepsilon_{it}$; where:

CAPRD = dependent variable; LEV, SIZE, AGE, ROA, LOSS_AVOID, SOFTW = independent variables; ε = random error; β_0 = constant term; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = regression coefficients.

LEV - represents the company's leverage, which is measured as: total debt / (total assets - capitalized R&D) (Landry & Callimaci, 2003). Consistent with the results of previous studies (Aboody & Lev, 1998; Landry & Callimaci, 2003; Oswald, 2008; Mazzi et al., 2019), we expect a positive association between the variables.

SIZE - the size of the firm is measured by the equation: $\ln(\text{total assets} - \text{capitalized development assets})$ (Cazavan-Jeny et al., 2011; Dinh et al., 2016). Based on the results of previous studies (Cazavan-Jeny et al., 2011; Landry & Callimaci 2003; Mazzi et al., 2019), we expect a negative association between the variables.

AGE - the age of the company is measured by the number of years the company has been listed on the Frankfurt Stock Exchange. Consistent with previous studies (Tutticci et al., 2007; Oswald et al., 2019), we expect a negative association between the variables.

ROA - return on assets is measured by the equation: $(\text{net income} - \text{capitalized development expenditures}) / \text{total assets}$. Based on previous studies (Markarian et al., 2008; Prencipe et al., 2008; Zicke, 2014), we expect a negative association between the variables.

LOSS_AVOID - loss avoidance is used as a binary variable. Companies that would record a loss without capitalizing development assets are given a value of 1, otherwise they are assigned a value of 0 (Zicke, 2014; Dinh et al., 2016). Based on previous studies (Zicke, 2014; Dinh et al., 2016), we expect a positive association between the variables.

SOFTW - the variable has a value of 1 if the company operates in the software technology industry, and 0 otherwise (if the company operates in the computer and Internet services industry). This data was collected manually from the companies' annual reports and their websites. The annual reports for 2018 were reviewed, and in certain cases information was obtained from the companies' websites.

The authors are aware of the limitations of the study. Not all the factors that influence the decision to capitalize development expenditures can be

included in our model. Some factors not included in the model may also influence the capitalization of development expenditures.

RESULTS OF THE EMPIRICAL ANALYSIS AND DISCUSSIONS

We first present the characteristics of the sample. Table 1 shows the number of observations in which development expenditures were capitalized (the dependent variable was assigned a value of 1) and the number of observations in which development expenditures were not capitalized (dependent variable was assigned a value of 0). The data shows that development expenditures were capitalized in 1,163 (31.3%) of 3,718 observations and not capitalized in 2,555 cases (68.7%).

Table 1. *Frequencies for the dependent variable – (non)capitalization of development expenditures*

	Frequency	Percentage	Cumulative percentage
0	2,555	68.7%	68.7%
1	1,163	31.3%	100%
Total	3,718	100%	

Source: Own calculations based on data from Worldscope

Table 2 shows the descriptive statistics of the sample. The average value of assets amounts to €2,158,410,000 and standard deviation €9,100,493,000, which shows that the firms in the sample differ in their size. The average value of generated total revenues is €1,393,716,000 (standard deviation €5,782,554,000) and average value of owners' equity €1,371,619,000 (standard deviation €5,852,218,000). On average the net income was positive, it amounts to €155,617,000. The adjusted ROA (calculated as presented in Chapter 4) is on average negative.

Table 2. *Descriptive statistics of the sample*

	Average value	Standard deviation	Median	Minimum	Maximum
Total assets - (in 000 €)	2,158,410	9,100,493	170,398	352	107,757,205
Total revenues (in 000 €)	1,393,716	5,782,554	135,603	0	82,630,806
Total owners' equity (in 000 €)	1,371,619	5,852,218	100,444	92	80,288,058
Net income (in 000 €)	155,617	1,077,973	4,391	-15,244,274	19,310,917
ROA*	-0.55	18.05	3.53	-100.30	41.80
Loss avoidance	0.02	0.150	0.00	0.00	1
Leverage**	0.22	0.19	0.19	-1.85	1.00
Size	12.16	2.19	12.04	5.86	18.49
Age	8.84	6.68	10	0	30

Source: Own calculations based on data from Worldscope

*ROA is measured as (net income - capitalized development expenditures) / total assets.

** Leverage is measured as: total debt / (total assets - capitalized R&D) (Landry & Callimaci, 2003).

The average value and median of “loss avoidance” variable shows that most of the firms in the sample did not avoid a loss by capitalizing development expenditures. The adjusted leverage amounts to 0.22 (standard deviation 0.19). On average the firms in the sample have been operating for 8.84 years (standard deviation 6.68), the median value is 10 years. The data show that the firms in the sample are relatively young, which is not surprising given that the sample covers the ICT industry, which has experienced significant growth in recent decades.

The correlation matrix (Table 3) shows that there is a positive correlation between leverage and ROA (0.083), and age and leverage (0.048). In both cases the positive relationship is weak. A negative correlation is found in the case of size and leverage (-0.032), age and ROA (-0.159), age and size of the firm (-0.206), and size and ROA (-0.225). None of the above relationships are strong.

Table 3. *Correlation matrix*

	(Intercept)	LOSS_AVOID	LEV	SIZE	ROA	AGE	SOFTW
(Intercept)	1.000	.000	-.166	-.938	.238	-.015	-.099
LOSS_AVOID	.000	1.000	.000	.000	.000	.000	.000
LEV	-.166	.000	1.000	-.032	.083	.048	-.013
SIZE	-.938	.000	-.032	1.000	-.225	-.206	.000
ROA	.238	.000	.083	-.225	1.000	-.159	-.019
AGE	-.015	.000	.048	-.206	-.159	1.000	-.069
SOFTW	-.099	.000	-.013	.000	-.019	-.069	1.000

Source: Own calculations based on data from Worldscope

To test the presented model (Chapter 4), we used probit regression analysis, which yields the results shown in Table 4. The results show that the capitalization of development expenditures is significantly positively related to the size and ROA of the firm and negatively related to the age of the firm. Larger, younger, and more profitable firms are more likely to capitalize development expenditures. On the other hand, there is a negative relationship between the capitalization of development expenditures and leverage, indicating that firms with a lower share of debt in total capital are more likely to capitalize development expenditures. However, this relationship is not statistically significant. The loss avoidance variable in the model proved not to be statistically significant. Compared to Internet companies and companies offering computer services, software companies are less likely to capitalize development expenditure, however the relationship is not statistically significant.

Table 4. *The results of probit regression analysis*

Source	Predicted sign	B	Wald Chi-Square	Sig.
(Intercept)		-1.930	192.682	.000
LOSS_AVOID	+	7.844	.000	1.000
LEV	+	-.044	.137	.711
SIZE	-	.127	131.787	.000*
ROA	-	.004	6.475	.011*
AGE	-	-.016	20.707	.001*
SOFTW		-.076	2.593	.107

Source: Own calculations based on data from Worldscope

* Statistical significance at 5%

In accordance with the results the first hypothesis (companies that have higher leverage are more likely to capitalize development expenditures) cannot be confirmed because the relationship between the variables turned not to be statistically significant, moreover the results of our analysis show a positive relationship between the variables, which is contrary to our expectations. The results are not in line with those of Landry and Callimaci (2003) and Mazzi et al. (2019). Our results do not suggest that more leveraged firms are more interested in the capitalization of development expenditures instead of expensing them in the income statement, which would reduce the profit/increase loss.

The second hypothesis (larger companies are less likely to capitalize development expenditures) must be rejected, because the relationship has been shown to be exactly the opposite. Our results show that larger companies are more likely to capitalize development expenditures. This relationship is strong and statistically significant. Our results are contrary to those of El-Sayed (1985), Aboody and Lev (1998), Landry and Callimaci (2003), and Mazzi et al. (2019).

The third hypothesis (older firms are less likely to capitalize development expenditures) can be confirmed. Our results are in line with those of Tutticci et al. (2007) and Oswald et al. (2019).

The fourth hypothesis (more profitable firms are less likely to capitalize development expenditures) must be rejected, as the relationship turned out to be just the opposite. More profitable companies are more likely to capitalize development expenditures. The variable is statistically significant. Our results contrast with those of Markarian et al. (2008),

Prencipe et al. (2008), and Zicke (2014). Our research indicates that companies in our sample tend to disclose positive information about their R&D projects to inform investors of future benefits. Due to lucrative operations, such disclosure is legitimate.

The fifth hypothesis cannot be confirmed because it was found that the loss avoidance variable did not have a statistically significant effect on the capitalization of development assets. Although recent studies have found that loss avoidance has a positive impact on the capitalization of development expenditures, our study did not find that it was significantly related to the capitalization of development expenditures.

CONCLUSIONS

Under current accounting standards in use, the development expenditures can be capitalized as intangible assets in the balance sheet or expensed in the financial period when they occur. Capitalized development expenditures as assets in the balance sheet provide information about future economic benefits expected from the asset. On the other hand, immediate recognition of development assets as costs affects the income for the financial year (reduces the profit or increases the loss). The decision to record development expenses as assets or expenses does not have the same effect on the financial statements and financial ratios based on which a company's performance is assessed. Previous research has shown that management can use the discretion implemented by accounting standards to act opportunistically and choose the alternative that best suits them in a given situation.

We focused our research on the ICT industry as one of the industries with the largest share of R&D expenditures. To the best of our knowledge this is the first research covering so many firms from the ICT industry which are publicly quoted in the EU and report under IFRS. In accordance with previous research, we have expected that the size of the firm, ROA and age of the firm will have a negative impact on the likelihood of capitalizing development assets. The age of the firm was the only variable that was found to have the expected (negative) sign. On the other hand, the size of a firm and ROA were found to have a statistically significant positive effect on capitalization of development assets. More profitable and larger firms

are more likely to record development assets. This contrasts with the results of previous studies. In addition to the above variables, we also tested two motives related to opportunistic managerial behaviour. We found that the financial leverage has a negative relation with capitalization of development assets, which is contrary to several previous studies. However, the variable was not statistically significant. Similarly, also the variable "loss avoidance" is not significant. Compared to companies that would not avoid a loss, those companies that would avoid a loss if capitalizing development expenditures were more likely to capitalize development expenditure, however the relationship is not statistically significant.

The results of our research are important both from the point of view of the profession (users of financial statements, standard setters), as well as the contribution to the scientific literature from the field of positive accounting theory. The results of our study indicate that there are factors suggesting that companies are more inclined to capitalize development expenditures under certain circumstances. However, since the independent variables "leverage" and "loss avoidance" (as the most frequently discussed motives in the literature that suggest opportunistic behaviour on the part of management in the ICT industry) were not found to be statistically significant, it cannot be argued that management exploits the discretion allowed by accounting standards to act opportunistically.

Future studies could focus on the relationship between firm performance and capitalized development expenditures and provide an answer to the question whether recognized development assets have generated future economic benefits. In this way, it would be possible to determine whether development assets were recognized because a future economic benefit was expected or whether other motives or factors were associated with the capitalization process.

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DISKRECIONO KAPITALIZOVANJE RAZVOJNIH TROŠKOVA

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Sažetak: Rad ispituje diskrecionu prirodu (ne)kapitalizovanja razvojnih troškova u finansijskim izveštajima. Pregled literature pokazuje da kompanije mogu imati različite motive i faktore za (ne)kapitalizovanje razvojnih troškova. Za potrebe ovog rada analiziran je uzorak od 547 kompanija iz sektora informacionih i komunikacionih tehnologija (IKT) koje su se našle na Frankfurtskoj berzi u periodu 2009-2018. Sektor IKT je izabran jer predstavlja privrednu granu koja ima velike troškove za istraživanje i razvoj. Rezultati „probit” regresione analize na 3.718 posmatranih slučajeva pokazuju da postoji značajna pozitivna korelacija između kapitalizacije razvojnih troškova i veličine kompanije, odnosno povrata na imovinu, dok postoji značajna negativna korelacija sa starošću firme. Kod većih i uspešnijih firmi veća je verovatnoća kapitalizacije razvojnih troškova, dok je kod starijih firmi manje izgledna kapitalizacija razvojnih troškova. Rezultati ovog rada doprinose naučnoj literaturi iz oblasti pozitivne računovodstvene teorije tako što pružaju dodatne uvide u faktore povezane sa odlukama o (ne)kapitalizovanju razvojnih troškova.

Gljučne reči: kapitalizacija / razvojni troškovi / diskreciono pravo (sloboda odlučivanja) / podsticaji / nematerijalna imovina.