

DETERMINANTS OF ACCOUNTING CREATIVITY: EMPIRICAL ANALYSIS ON ROMANIAN SMEs IN CONSTRUCTION INDUSTRY

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Abstract: *Most research on accounting creativity in our country have approached the companies that had securities admitted on trading in the capital market. But the phenomenon may occur at the level of SME which are not listed on the stock exchange as well. This motivated us to consider this type of entities for our analysis. We focused on the construction industry as it is the base of the economy development and the accounting principles for this sector are very complex. The data was requested directly from entities and manually processed. Using two different models of multiple linear regression analysis, we have estimated the level of discretionary accruals. By comparing the results, we highlighted that for our sample the first model was more relevant. We then tested the influence that entity size, indebtedness ratio, and financial difficulties exert on accounting creativity. The results of our study did not determine a relevant impact of these determinants. We conclude that further research is needed to analyse in a qualitative approach the managers' motivations for creative accounting techniques.*

Keywords: accounting creativity, construction, discretionary accruals, earnings management, SME.

JEL classification: M41, M21, C12, C15.

1. Introduction

Accounting creativity is the subject of numerous scientific debates and research at a global level. One of the best-known and most analysed techniques is earnings management, which is based on the accrual accounting principle, and consists in distorting the results presented in the profit and loss account: reducing, increasing or maintaining them within certain limits, depending on the expectations of some users. The impact of these practices on the quality of information presented in the financial statements is significant in users' decisions and is a challenge for the accounting profession. International accounting regulators such as the International Accounting Standard Board (IASB) have as their primary objective the limitation of accounting creativity and the transparency and objectivity of the information presented in the financial statements.

Construction industry is the development basis of any national economy. One of the most important characteristics of the accounting system in this economic sector is the treatment of contracts that take place over several years, involving the recognition of expenses and revenues on accrual basis and thus creating prerequisites for creative accounting techniques.

The first manifestations of creative accounting appeared in the context of the development of capital markets and aimed at distorting the financial indicators presented to investors in order to influence the price of securities. That is why most research in the field targets the companies operating in these markets and whose financial information can have a

significant impact on the economy. However, creative practices also appear at the level of small and medium entities that are not listed, but there is not much research on them. At the same time, for listed Romanian entities the access to financial data is facilitated by the legal obligation to publish their full financial statements.

Due to the importance of construction industry to the development of the national economy, as well as to the particularities of this sector's accounting principles, our intention was to identify and analyse the creative accounting practices at the level of the Romanian SME with construction activity whose securities are not admitted on trading. To this end, we have estimated the level of discretionary accruals and we have identified and analysed the main factors of influence on them. In the light of accrual accounting principle, non-discretionary accruals are those found in economic conditions, in the entity's operating cycle, while the discretionary component of accruals is influenced by the subjective choices of management structures and is thus an element to measure the quality of the financial statements.

In the first part of the paper we analysed the relevant literature on the concepts of creative accounting and earnings management, we continued with the presentation of the research methodology and finally we synthesized the results and formulated our own conclusions.

2. Literature review

Creative accounting techniques take on different forms and rely mainly on the flexibility of accounting regulations that allow for different choices between several methods and policies for recording and presenting the economic transactions. Earnings management is one of the most debated issues of ethics in the international accounting profession (Geiger, et al., 2006, p.178). In the context of the global economy, the users of financial statements need high-quality accounting information to base their economic decisions.

According to Dechow and Skinner (2000: 237), accrual accounting is the starting point for creativity and may lead to the manipulation of entity outcomes through discretionary accruals. But determining the level of creativity is a very difficult process. In a study on the effects of the adoption of International Financial Reporting Standards, Ahmed, Chalmers and Khelif (2013) used discretionary accruals to quantify the level of earnings management, a direction adopted by many research in the field. One of the most widely used models of empirical analysis for estimating discretionary accruals is Jones Model (Jones, 1991), which uses the variance of revenues and the gross value of plant, property and equipment as independent variables. Dechow Model (Dechow, Sloan and Sweeney, 1995), also known as Modified Jones Model, diminishes the revenues variation with the variance of receivables and Chen (2010) showed that this is one of the most robust approaches to the detection of creative accounting practices and earnings management.

On the other hand, Kothari, Leone and Wasley (2005) included ROA (return on assets) in the estimation of discretionary accruals, but Keung and Shih (2014) demonstrated that such performance-based models may in some cases have significant errors with negative impact on the obtained results.

The method of estimating discretionary accruals to detect the level of accounting creativity is also used for Romanian entities. Dobre, Brad and Ciobanu (2015) estimated discretionary accruals to compare the quality of financial statements prepared by listed entities under Romanian accounting regulations and using International Financial Reporting Standards. Mătiș, et al. (2010) compared three models of empirical analysis of discretionary accruals, also using a sample of companies listed on the stock exchange. In Romanian literature we have not identified similar studies conducted on unlisted small and medium enterprises.

Douglas Moses (1987) studied the phenomenon of earnings management on a sample of 212 states in the European Union. The results of this research showed that one of the factors that can determine this kind of creative techniques is the size of the entities.

Another factor underlying the tendency to distort accounting information is the companies' necessity for financing (Yadav, Kumar and Bhatia, 2014). Thus, the financial statements are modeled to present better financial performance to creditors. This idea was also supported by the study conducted by Ciuhureanu and Balteş (2009) based on a survey on Romanian entities, study which shows that the use of creativity in accounting is motivated in a proportion of 43.1% by the need to obtain bank credits or other forms of financing. At the same time, Rodriguez-Perez and van Hemmen (2010) showed that an increase in reported debt causes entities to resort to creative accounting practices.

A research on financial predictors of bankruptcy conducted by Serrano-Cinca, Gutiérrez-Nieto, and Bernate-Valbuena (2018) revealed that the information presented by the financial statements of entities that face financial difficulties suffers significant distortions due to earnings management.

Considering these aspects, we have estimated the level of discretionary accruals and we have analysed the influence of the size of the entity, the indebtedness ratio and the financial distress on earnings management for the Romanian SME in construction industry.

3. Research methodology

In order to estimate the discretionary accruals, we conducted an empirical cross-section analysis on a sample of 29 financial statements for the year 2017 presented by small and medium construction enterprises operating on the western market of Romania in the counties of Arad, Timiș and Hunedoara. The reports have been individually requested from each entity and manually recorded, as for not listed companies the publication of full financial statements is not mandatory according to Romanian law. The necessary data was then processed in order to calculate the financial indicators appropriate to the statistical models that have been used.

In the first part of the study, we estimated the non-discretionary accruals by running a multiple linear regression model in the RStudio computer program (RStudio Incorporated, 2018). For this purpose, we calculated the amount of total accruals based on financial indicators. The net profit presented by entities in the financial statements is composed of the operating cash flow plus the amount of non-cash accruals (Teoh, Welch and Wong, 1998). Therefore, the total accruals were determined as follows:

$$(1) ACC_i = NP_i - OCF_i$$

where:

ACC_i – are the total accruals for entity i

NP_i – is the net profit for entity i

OCF_i – is the operating cash flow for entity i

Since the small and medium enterprises that are the object of our research are not required to present the Cash Flow Statement, we used a model developed by Brîndescu-Olariu (2014) to determine the operating cash flow, which allows the calculation based on the balance sheet data and the profit and loss account, without requiring additional information. The method of calculating the cash flow from operations based on this model is presented in Figure 1.

(+)	Total revenues
(-)	Decrease of provisions
(+)	Increase of deferred income
(-)	Decrease of deferred income
(+)	Increase of reserves
(-)	Profit appropriation
(+)	Increase of retained earnings
(-)	Increase of accounts receivable
(+)	Decrease of accounts receivable
<hr/>	
= Cash income from operations	
(+)	Total expenses
(-)	Impairment losses on non current assets
(-)	Increase of provisions
(+)	Decrease of reserves
(+)	Decrease of retained earnings
(+)	Increase of inventories
(-)	Decrease of inventories
(-)	Decrease of deferred expenses
(+)	Increase of deferred expenses
(-)	Interest expense
(-)	Increase of non-financial debts
(+)	Decrease of non-financial debts
= Cash outflows from operations	
Operating cash flow =	
	(+) Cash income from operations
	(-) Cash outflows from operations

Figure 1: Method of calculation of the operating cash flow
Source: adaptation after Brîndescu-Olariu (2014)

Our choice of models for estimating discretionary accruals was based on an analysis of the relevant studies on the accuracy of statistical tests and the precision of the results provided by them.

Among the first developed models in this respect are those that consider the value of non-discretionary accruals to be constant over time (Healy, 1985; DeAngelo, 1986). However, changes in economic circumstances may cause variations in non-discretionary accruals, which could determine statistical errors in models based on these premises (Kaplan, 1985: 111).

In developing their model, Jones (1991) considered the effects of modifications in non-discretionary accruals under the impact of economic changes. The author used the residual variable of the regression as a determinant of discretionary accruals. Their study was conducted on companies in the United States of America and confirmed the existence of creative accounting practices for entities listed on the stock exchange (Jones, 1991: 193). However, the author admits that the revenues reported by entities and used in their model could be influenced by the adoption of managerial decisions aimed at changing the timing of transactions, the so-called real earnings management technique (Jones, 1991: 212).

To eliminate the risk that statistical results will be altered by such operational decisions of management, Dechow, Sloan and Sweeney proposed a modified version of the Jones Model, diminishing the revenues variation with the variance of the receivables in the

regression equation (Dechow, Sloan and Sweeney, 1995: 199). Thus, estimating the discretionary accruals as proxies for earnings management will not be altered when real earnings management techniques are used, which has led us to choose this model in our case study.

Moreover, Chen (2010: 61) analyzes the detection of creative accounting practices using statistical models based on discretionary accruals and concludes that the Dechow Model (Modified Jones Model) does not present a superior alternative.

More recent research examines the impact of financial performance on the estimated level of discretionary accruals (Kothari, Leone and Wasley, 2005). The conclusions of the authors point to an increase in the accuracy of the results when the estimation takes note of the return on assets (Kothari, Leone and Wasley, 2005: 195).

Considering these aspects, we estimated the non-discretionary accruals both through the Dechow Model (Dechow, Sloan and Sweeney, 1995) and the Performance-based Model (Kothari, Leone and Wasley, 2005), comparing the results by using specific statistical criteria. We used as the dependent variable the total accruals previously calculated.

For the Dechow Model, the regression equation is:

$$(2) ACC_i = \alpha + \beta_1 \times (\Delta REV_i - \Delta REC_i) + \beta_2 \times PPE_i + \varepsilon$$

where:

ACC_i – is the value of total accruals for entity i

ΔREV_i – is the change in revenues for entity i

ΔREC_i – is the change in accounts receivable for entity i

PPE_i – is the gross value of plant, property and equipment for entity i

β – is the estimated relationship between independent variables and dependent variable

ε – is the cumulative effect of other factors that may influence the dependent variable

The independent variables of the model take into account the factors that determine the accruals and derive from the operating activity. The change in revenues diminished by the change in accounts receivables expresses the accrual income that is not reflected in the cash-flow but comes from the entity's revenues and is not influenced by management's choices. The gross value of plant, property and equipment is used because their net value is diminished by depreciation, and in terms of depreciation discretionary behavior may work, because the choice of the duration of use of the fixed assets and the depreciation method are liable to subjectivism.

For estimating non-discretionary accruals through the Performance-based Model we defined the following equation:

$$(3) ACC_i = \alpha + \beta_1 \times (\Delta REV_i - \Delta REC_i) + \beta_2 \times PPE_i + \beta_3 \times ROA_i + \varepsilon$$

where:

ROA_i – is the return on assets for entity i

Robu, Anghel and Șerban (2014) determined ROA by formula:

$$(4) ROA = EBIT (1 - \text{tax rate}) / A$$

where:

EBIT – is the value of earnings before interest and taxes

A – is the value of total assets

Since according to the Romanian tax law the income tax is differentiated by categories of entities with different taxable bases and tax rates, we have calculated ROA based on the net profit, as follows:

$$(5) \text{ ROA} = \text{NP} / \text{A}$$

where:

NP – is the net profit

A – is the value of total assets

In order to run the two regression models, the variables ACC, ΔREV , ΔREC and PPE were scaled (divided) by total asset value to obtain a set of non-dimensional estimators for both the dependent variable and the independent variables.

Using the obtained β estimates, we have determined the amount of discretionary accruals as the residuals from the regression, representing the difference between the total calculated accruals and the estimated non-discretionary accruals:

$$(6) \text{ DA}_i = \text{ACC}_i - \text{NDA}_i$$

where:

DA_i – is the value of the estimated discretionary accruals for entity i

ACC_i – is the value of total accruals calculated for entity i

NDA_i – is the value of non-discretionary accruals estimated for entity i

Having obtained the estimated level of discretionary accruals, we tested the main factors of influence we have previously identified based on the relevant literature and formulated the hypotheses for our analysis.

In their study on earnings management techniques, Douglas Moses (1987: 363) considers the public perception of companies operating on a particular market. Thus, the larger the entity, its exposure to the public space becomes more important and the tendency to use creative accounting techniques appears, in order to show financial results without time fluctuations, which does not signal any anticompetitive practices or economic crises.

Based on the results obtained by the author in this respect, we considered testing on our sample the influence that the entity size exerts on the accounting creativity by formulating the first hypothesis:

H1: *The larger the company, the higher the level of discretionary accruals.*

For obtaining financing in favorable conditions, entities tend to improve the accounting information presented during the negotiations with the financial institutions in order to improve their perception of the financing risks. This can lead to a positive correlation between entity indebtedness rate and accounting creativity and allows us to formulate the second hypothesis:

H2: *The higher the indebtedness rate, the higher the level of discretionary accruals.*

Entities with an unstable economic situation tend to manipulate the results in the financial statements to provide users with improved information and temporarily hide the difficulties they are crossing (Micah and Chinwe, 2014: 2109). This kind of techniques are meant to

maintain an improved image of the company in the perception of the market. In this direction, we have formulated the third hypothesis of our study:

H3: *The entity's financial distress has a positive influence on the value of discretionary accruals (the higher the risk of bankruptcy, the higher the level of discretionary accruals).*

We have rated the size of the entity according to the volume of total assets. We then determined the global indebtedness rate by the following formula:

$$(7) D/E = D / E \text{ (Bătcă-Dumitru, Sahlan and Irimescu, 2018)}$$

where:

D/E – is the global indebtedness rate (the leverage ratio)

D – is the value of total debt

E – is the value of equity

In order to calculate the degree of financial distress of the entities we used a predictive bankruptcy score for the Romanian companies, based on Robu (2014):

$$(8) S_i = 5,676 + 6,3718 \times ROA_i + 5,3932 \times OCF/D_i - 5,1427 \times D/A_i - 0,0105 \times APP_i$$

where:

S_i – is the predictive bankruptcy score for entity i

ROA_i – is the return on assets for entity i, calculated as in formula (5)

OCF/D_i – is the cash flow debt coverage for entity i, calculated as the ratio between the operating cash flow and total debt

D/A_i – represents the leverage ratio of the assets for entity i, calculated as the ratio between total debt and total assets

APP_i – is the average payout period for entity i

The average payout period was calculated as follows:

$$(9) APP = AD / REV \text{ (Robu, Anghel and Șerban, 2014)}$$

where:

AD – is the average amount of debt

REV – is the value of total revenues

To test the three formulated hypotheses, we run the linear regression model in RStudio computer program (RStudio Incorporated, 2018):

$$(10) DA_i = \alpha + \beta_1 \times A_i + \beta_2 \times D/E_i + \beta_3 \times S_i + \varepsilon$$

where:

DA_i - is the value of the estimated discretionary accruals for entity i

A_i - is the value of total assets for entity i

D/E_i - is the global indebtedness rate for entity i

S_i - is the predictive bankruptcy score for entity i

To eliminate the scale effect, the data was restated using the zero-mean normalization method, resulting in a set of non-dimensional estimators for model variables.

4. Results and discussions

Using the two models of non-discretionary accruals estimation, we synthesized two sets of obtained results in Table 1 and Table 2.

Table 1: The results on non-discretionary accruals using the Dechow Model

Residuals:					
Min	1Q	Median	3Q	Max	
-0.81429	-0.26278	-0.03103	0.12677	2.87471	
Coefficients:					
	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	0.10583	0.13260	0.798	0.432008	
$\Delta\text{REV} - \Delta\text{REC}$	-0.09304	0.02369	-3.928	0.000564	***
PPE	-0.27760	0.02847	-9.749	3.59E-10	***
Signif. codes	0 '****'	0.001 '***'	0.01 '*'	0.05 '.'	0.1 '' 1
Residual standard error: 0.6775 on 26 degrees of freedom Multiple R-squared: 0.7854, Adjusted R-squared: 0.7689 F-statistic: 47.57 on 2 and 26 DF, p-value: 2.052e-09					
Durbin-Watson test:					
DW = 2.4286, p-value = 0.8809 alternative hypothesis: true autocorrelation is greater than 0					
Akaike info criterion 64.54733					
Bayesian info criterion 70.01652					

Source: Authors own computation

Table 2: The results on non-discretionary accruals using the Performance-based Model

Residuals:					
Min	1Q	Median	3Q	Max	
-0.82594	-0.27397	-0.03745	0.11888	2.86419	
Coefficients:					
	Estimate	Std. Error	t value	Pr(> t)	
(Intercept)	0.11780	0.16864	0.699	0.491283	
$\Delta\text{REV} - \Delta\text{REC}$	-0.09246	0.02463	-3.753	0.000931	***
PPE	-0.27791	0.02914	-9.536	8.39E-10	***
ROA	-0.10107	0.85154	-0.119	0.906466	
Signif. codes	0 '****'	0.001 '***'	0.01 '*'	0.05 '.'	0.1 '' 1
Residual standard error: 0.6907 on 25 degrees of freedom Multiple R-squared: 0.7855, Adjusted R-squared: 0.7597 F-statistic: 30.51 on 3 and 25 DF, p-value: 1.617e-08					
Durbin-Watson test:					
DW = 2.4284, p-value = 0.8896 alternative hypothesis: true autocorrelation is greater than 0					
Akaike info criterion 66.531					
Bayesian info criterion 73.36748					

Source: Authors own computation

The result of the Durbin-Watson test for both models is close to baseline 2 and the test probability of 88.09% in the first model and 88.96% in the second model does not reject the null hypothesis of this test, that there is no autocorrelation between the residuals.

By comparing the obtained results, it is first noted that for ROA used as an independent variable in the second model, the value of the t-student test is well below the threshold of 2, so that this variable does not have a significant impact on non-discretionary accruals. This assertion is also reinforced by the value of the significance threshold illustrated by $Pr(>|t|)$, which exceeds 10%, therefore not being statistically accepted.

At the same time, both the Akaike info criterion and the Bayesian info criterion show inferior values for the Dechow Model, which is more economical than the performance-based one. For these reasons, in the second part of our study we used the results obtained with Dechow Model. According to these, we have a negative correlation of -9.304% between non-discretionary accruals and the change in revenues diminished by the change in receivables ($\Delta REV - \Delta REC$). The situation is similar in the case of the gross value of plant, property and equipment (PPE) with an inverse variation of -27.76%.

The residuals of the regression express the estimated level of discretionary accruals for each entity.

In Table 3 we synthesized the results of the linear regression model for estimating the discretionary accruals according to the variables that quantify the factors of influence we identified in the literature: the size of the entity, the indebtedness ratio and the financial distress.

Table 3: The results on discretionary accruals

Residuals:				
Min	1Q	Median	3Q	Max
-1,2770	-0,4242	-0,0629	0,1565	4,4711
Coefficients:	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	3.046E-11	1.992E-01	0.000	1.000
A	3.245E-02	2.007E-01	0.162	0.873
D/E	2.341E-02	2.008E-01	0.117	0.908
S	7.911E-02	1.994E-01	0.397	0.695
Residual standard error 1.073 on 25 degrees of freedom				
Multiple R-squared: 0.007819, Adjusted R-squared: -0.1112				
F-statistic: 0.06567 on 3 and 25 DF, p-value: 0.9776				
Durbin-Watson test:				
DW = 2.3864, p-value = 0.8729				
alternative hypothesis: true autocorrelation is greater than 0				
Akaike info criterion	92.07078			
Bayesian info criterion	98.90726			

Source: Authors own computation

We noted that the obtained results reject the three formulated hypotheses, the significance threshold value $Pr(>|t|)$ exceeds 10% for each of the dependent variables. In other words, the size of the entity, the indebtedness ratio and the financial distress have no statistical significance for the model, the estimated discretionary accruals could not be explained by these three determinants.

4. Conclusions, research limitations and future directions

Although accounting creativity among listed companies has a significant impact on the economy, these practices are also found at the level of small and medium enterprises and can influence the quality of the information presented by their financial statements. Therefore, analysing earnings management due to accrual accounting for this type of entities is important in accounting research.

Our study aimed to determine the discretionary accruals in Romanian construction industry at the level of unlisted SME and to analyse the impact of some determinants on accounting creativity. This is our contribution to accounting research, as all similar studies identified in Romanian literature have lent to the listed entities.

The level of discretionary accruals was estimated using the Dechow Model and the Performance-based Model, the latter being less economical. That is why the results of the Dechow Model were used in our analysis.

As for the underlying factors for accounting creativity, our study did not provide conclusive results that the size of entity, the indebtedness ratio or the financial distress had an impact on earnings management.

One of the limitations of our research is the small size of the statistical sample, that is due to the difficulties in obtaining the necessary data, because in Romania the non-listed SME are not obliged to publish the financial statements in full. Another impediment was the manual processing of the obtained information in order to determine the financial indicators required for the development of the models.

However, estimating discretionary accruals over a single period of time is not an unbeatable proof of managers' intention to manipulate earnings through creative techniques, but can only show that there are disruptions to financial indicators at a given time. Therefore, the results must be complemented by a qualitative analysis of the events that have determined changes in the structure of the financial statements.

At the same time, in studying the motives of management bodies for accounting creativity, a qualitative approach is required, taking into account the cultural, professional and business ethics considerations. Survey-based studies may be more relevant for such an approach.

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A preliminary version of this paper was published in the Proceedings of the 9th International Conference of Doctoral Students and Young Researchers, University of Oradea, December 2018, under the title "Reflections on The Use of Creative Accounting in the Presentation of Financial Information by Construction Companies". In this work we approached the main aspects of the creative accounting practices, as well as the causes that can determine them, based on the relevant economic literature.

In the current paper we continued the previous research by identifying the determinants and analyzing their impact on the creative accounting practices in the presentation of the financial statements by the Romanian SME in construction industry.

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Bio-note

Daniela Pordea is a PhD student of the Doctoral School of Economics and Business Administration, Western University of Timișoara. In her doctoral research she focuses on the accounting system of the construction industry. Daniela conducted previous research on performance guarantees, provisions and cost calculation for construction services.

Dorel Mateș, PhD, is a professor of the Faculty of Economics and Business Administration, Western University of Timișoara. As a PhD coordinator in accounting, the author supervised 26 PhDs students to graduation. The author's areas of interest in research include financial accounting, International Financial Reporting Standards, but also the specific accounting policies and accounting normalization.