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The credibility of earnings announced by new stock companies: accrual and real earnings management

JEL Classification: *G34; G32; G23*

Keywords: *initial public offering; real earnings management; discretionary accruals; listing status*

Abstract

Research background: An initial public offering (IPO) creates an excellent opportunity to research the impact of changes in the institutional environment of companies on the trustworthiness of the information disclosed in financial statements.
Purpose of the article: The main aim of the study is to analyze the use of accrual and real earnings management to inflate earnings, revenue, or total assets around the going public event. Therefore, this paper contributes to the stream of study on the quality of financial reporting of new stock companies.
Methods: Two main approaches reflect the use of various types of earnings management activities, i.e., discretionary accruals and real earnings management. In both cases, it was necessary to use proper OLS method estimated models to identify the normal level of categories that affect the results reported in financial statements.
Findings & value added: Based on a sample of 183 IPOs from the Warsaw Stock Exchange between 2005 and 2015, generally, managers of newly-listed companies actively use discretionary accruals, reduce production costs and certain discretionary expenses, and abnormal cash flows from operations — i.e., all proxies of earnings management used in the paper — in the periods around the IPO. In the period prior to the IPO, managers more often introduce techniques typical of the real sphere of the company's operations, in particular, the deliberate modeling of certain discretionary costs. In turn, the use of discretionary accruals dominates in the year after the IPO.

Introduction

When transforming from private to public ownership, an initial public offering (IPO) allows for in-depth research on both the impact of institutional changes on the quality of reported financial results and the decisional utility of financial statements to potential investors. Due to the growing need for efficient capital allocation among investors, the value relevance of accounting information has gained increasing attention not only in accounting research (Zarowin, 2015, p. 2), but also in corporate finance studies (Shan, 2015, pp. 186–187).

There is an intensive discussion in the literature on the use of earnings management in IPOs, and the conclusions of the current research seem to question the previous findings. Initial studies suggest that managers intensively manipulate reported financial results to obtain a higher valuation of shares in the first public sale (Teoh *et al.*, 1998, pp. 1935–1974; Ducharme *et al.*, 2004, pp. 27–49), taking advantage of the information asymmetry present in the IPO. Therefore, they make an unjustified transfer of wealth between particular groups of shareholders, namely, from new stock market players to the original owners of the companies (Sletten *et al.*, 2018, p. 872). Although the existence of the incentive to manage earnings upwards before an IPO is not generally questioned, a growing body of literature shows that those conclusions could have been prematurely formulated based on incorrect assumptions. By contrast, Roosenboom *et al.* (2003, pp. 243–266), Venkataraman *et al.* (2008, pp. 1315–1345), and Ball and Shivakumar (2008, pp. 324–349) point out that going public companies tend to use conservative rather than aggressive pre-IPO financial reporting, anticipating the high adverse costs and negative market consequences.

Another area of discussion is the methodological issues applied in research on earnings management in the new publicly listed companies. Most researchers focus on discretionary accruals (e.g., Aharony *et al.*, 2010, pp. 1–26; Armstrong *et al.*, 2016, pp. 1316–1338). However, current findings directly point to the need for a comprehensive approach to this issue and the inclusion of a wider range of forms of earnings management in the analysis (Li, 2019). Such a scientific interest, both theoretical and empirical, inspires further research on this topic and motivated this study.

The main aim of the study is to analyze the link between obtaining the status of a public company and using intentional management actions that focus on inflating earnings, revenue, or total assets. Therefore, the study examines the quality of financial reporting and its quantitative attributes. It will also investigate the informational value of reported financial results in ensuring the information needs of stakeholders on the capital market.

This paper investigates how changes in the institutional market environment that result from a company going public affect the scale of managers' use of tools for intentional earnings management. A company's profits help determine investment decisions on the stock market (Ducharme *et al.*, 2004, p. 27; McKee, 2005, p. 1). Thus, the reliability of financial reporting is crucial, and it is the focus of a wide range of investors and information intermediaries on the financial market.

The rest of this paper is organized as follows. The next section provides a literature background and describes the hypotheses. Section 3 presents the research sample and earnings management measures. Section 4 presents the empirical results and Section 5 discusses it. The last section concludes the paper.

Literature review and hypotheses development

It is common knowledge that reported earnings is an economic category susceptible to manipulation (Graham *et al.*, 2005, pp. 3–73), and the literature provides ample evidence of such practices worldwide (Shan, 2015, pp. 186–187). Managers are able to bias reported earnings in a specified direction by using real company activities or discretionary accruals. Three activities that deviate from typical business practices are undertaken to alter current period earnings (Li, 2019): those aimed at reducing the production costs, the deliberate limitation of certain discretionary expenditures, and intentionally influencing the level of operating cash flows (Roychowdhury, 2006, pp. 335–370). In turn, accruals earnings management is achieved by managerial discretion over the accrual component of earnings (Haga *et al.*, 2018, p. 421). It mainly involves modifying the accounting methods or estimates when presenting a given transaction in the financial statements (Zang, 2012, p. 676).

There is a number of reasons why companies choose to engage in earnings management. The perspective of the business environment in which they operate plays a significant role here (Hope *et al.*, 2013, pp. 1715–1742). For privately held companies, the main motives are that they can signal high quality to external capital providers (Graham *et al.*, 2005, pp. 3–73), tax minimization (Sundvik, 2017, pp. 31–42), the avoidance of value-destroying actions with consequences for owner-managers (Meo, 2017, pp. 399–414), and the preference for smooth earnings over a rapid value increase (Graham *et al.*, 2005, pp. 3–73).

In turn, the main drivers of earnings management for publicly listed companies are the typical agency problems and the substantial pressure of

the capital market on the continuous growth of the company's value (Graham *et al.*, 2005, pp. 3–73). Both encourage managers to take myopic actions aimed at creating impressions that the firm's profitability is greater than it is in reality (Haga *et al.*, 2018, p. 421).

Due to substantial information asymmetry in the IPO process, the incentive to manage reported earnings becomes even more intense. The financial results reported prior to the IPO are the main basis for setting the issue price, and they largely determine the demand for new shares. Thus, issuers may be prone to inflate earnings, revenue, or total assets, as they contribute appreciably to the initial firm value by boosting the offering price (Gao *et al.*, 2017, p. 90).

Portraying a more favorable earnings picture benefits the company's well-informed original owners at the expense of future shareholders who have limited access to information. This results in the unjustified wealth transfer from one group of investors to another (Sletten *et al.*, 2018, p. 872). Such an increase in IPO proceeds is possible if investors do not fully understand earnings management and are, therefore, not fully aware that reporting higher results in a given period is related to borrowing profits from the future or the past (Teoh *et al.*, 1998, p. 1938).

Nevertheless, the awareness of window-dressing techniques is quite common, especially among professional stock investors. The information presented in an IPO prospectus is analyzed in detail, not only by single stock investors or individual financial investors, but mainly by firms that specialize in the professional assessment of financial reporting. Thus, the extensive scrutiny of financial information in the process of transformation from private to public ownership constitutes a considerable barrier to aggressive earnings management aimed at achieving a higher valuation of shares in the IPO (Yu, 2008, pp. 245–271; Venkataraman *et al.*, pp. 1315–1345; Alhadab & Clacher, 2018, pp. 442–461).

Considering the practical possibilities of identifying the use of particular forms of earnings management, discretionary accruals are more likely to be detected in the pre-investment analysis process. Issuers are aware of the wide range of costs implied by being caught heavily exploiting such practices (Gao *et al.*, 2017, pp. 90–108). However, management activities aimed at the intentional structuring of business transactions and deliberately reducing certain discretionary expenditures can bring notable results in the form of a short-term increase in the reported financial results. What is particularly important in the context of identification on the basis of documents published in the IPO process, they are difficult to detect (Lisic *et al.*, 2011, pp. 315–335). Based on the above discussion, I posit the following hypothesis:

H1: *Before an IPO, firms are more likely to engage in real earnings management than accrual-based earnings management.*

The realities of the capital market, including the constant expectations of investors concerning the improvement of the financial results, exert enormous pressure on stock listed companies (Graham *et al.*, 2005, pp. 3–73). This pressure accumulates, especially at the moment of the IPO, as a key corporate event in the life of the company (Liu *et al.*, 2012, p. 505) and the *de facto* market verification of its value. It then stabilizes at a relatively certain level. Thus, the temptation to manage earnings persists, although not as intensely as in the period preceding the IPO and the first market valuation of the company's shares.

The practice of borrowing earnings from other periods has numerous limitations. After the IPO, the possibility of using discretionary accruals for upwards earnings management remains relatively unchanged. The financial reporting of companies is covered by a wide range of information intermediaries who ensure the identification of practices that may negatively impact the wealth of shareholders (Ball & Shivakumar, 2008, pp. 324–349, Haga *et al.*, 2018, p. 421). On the other hand, profit transfer from one reporting period to another in the form of real earnings management faces particular constraints. Since the company's business activity is of constant interest to the capital market players, managers are aware that such borrowing of profits diminishes the reported financial results in other periods.

Moreover, the excessive use of real earnings management destroys the potential to generate company value in the long term (Haga *et al.,* 2018, pp. 420–435). This is contrary to the interests of shareholders with a different than short-term investment horizon. The corporate governance system, and in particular, the efficient supervisory board guarding the interests of shareholders, may limit the use of such practice, at least to a certain extent. Prior to the IPO, the supervisory board should represent the original owners and act mainly in their interest, which is in line with the stock price increase in the first public sale. After the IPO, the number of shareholders and the spectrum of interests represented by the board is much wider. Hence, the second hypothesis:

H2: *In financial reporting after an IPO, accrual-based earnings management gains importance compared to real earnings management.*

As the earnings quality of newly-listed companies has captured the attention of researchers, numerous empirical studies have been conducted around the world that provide insight into the practice of financial report-

ing. However, the findings are not unequivocal (Dechow *et al.*, 2010, p. 384). Importantly, these results refer to stock markets with a different specificity and institutional framework compared to Poland, or Central and Eastern European markets in general.

Although earnings management has been analyzed (e.g. Strakova & Michalkova, 2020; Wójtowicz, 2015, pp. 141–147), these studies were generally not related to IPOs. In fact, the pre- and post-IPO practice of earnings management in these countries has been investigated very little so far. A few papers by Lizińska and Czapiewski (2018, p. 5), who investigated the use of discretionary accruals for Polish IPOs, provide some insight into this topic. Their conclusions indicate the use of opportunistic earnings management in the IPO year. Evidence relating to a similar practice in the years around an IPO shows it is used on a much smaller scale. Unfortunately, the previous research is limited to only certain aspects of earnings management and does not offer a comprehensive approach and analysis for a wide range of managerial activities in this area. This constitutes the grounds for this study and the novelty of this paper.

Research method

The study aims to discover what effect changes in the institutional environment of a company transforming from private to public ownership have on the purposeful action of managers to alter the reported earnings in a particular way. Towards this end, the financial results disclosed in the annual reports of 183 companies were analyzed. They went public on the main market of the Warsaw Stock Exchange between 2005 and 2015 and implemented the IPO in the form of the primary or secondary shares sale. Additionally, their head office was located in Poland, and their shares had not been publicly traded on any alternative markets before. Due to the unique and diverse regulations in financial reporting, banks and insurance companies are not included in the study. The research covers only those companies for which it was possible to obtain all the necessary financial information from the *Notoria Serwis* database.

To assess the quality of the reported earnings before the company's shares were publicly traded, the annual financial statements for the period before the IPO (T_{preIPO}) are analyzed. In turn, to recognize the scope of managers' intentional actions that are focused on altering the financial result after the IPO, the analysis comprises published financial data for the year following the year of the first stock listing ($T_{postIPO}$). Thus, the study compares the financial information for two full reporting periods of the

company's operation under different institutional frameworks for corporate governance, i.e., private and public shareholder supervision (see Figure 1).

It is impossible to directly observe management actions in the scope of *cooking the books*. Thus, a basic issue of the research methodology is to determine the best tools to estimate the scale of the individual financial statement items that result from the management's discretionary decisions. To achieve the objective of the study, two main approaches are used to reflect the use of various types of earnings management, i.e., real and accrual activities. In both cases, it is necessary to use econometric models to identify the normal level of the economic categories that affect the reported financial result. The difference between its observed empirical value and the estimated theoretical value for a given company determines the degree of earnings management.

According to the literature (Roychowdhury, 2006, pp. 335–370), abnormal values of production costs (*PROD*), discretionary expenditures (*DISC_EXP*), and operating cash flows (*CFO*) are measures of real earnings management activity. Therefore, consistent with earlier studies, the normal level of these figures are estimated for each company in the sample as a linear function of sales (*SALES*) and changes in sales (*ΔSALES*) in particular periods. The residuals from the following equations describe the scale of real earnings management in individual IPOs:

$$\begin{aligned}
&\frac{CFO_t}{TA_{t-1}} = \beta_1\left(\frac{1}{TA_{t-1}}\right) + \beta_2\left(\frac{SALES_t}{TA_{t-1}}\right) + \beta_3\left(\frac{\Delta SALES_t}{TA_{t-1}}\right) + \varepsilon_t \\
&\frac{DISC_EXP_t}{TA_{t-1}} = \beta_0 + \beta_1\left(\frac{1}{TA_{t-1}}\right) + \beta_2\left(\frac{SALES_{t-1}}{TA_{t-1}}\right) + \varepsilon_t \\
&\frac{PROD_t}{TA_{t-1}} = \beta_0 + \beta_1\left(\frac{1}{TA_{t-1}}\right) + \beta_2\left(\frac{SALES_t}{TA_{t-1}}\right) + \beta_3\left(\frac{\Delta SALES_t}{TA_{t-1}}\right) + \beta_4\left(\frac{\Delta SALES_{t-1}}{TA_{t-1}}\right) + \varepsilon_t
\end{aligned} \tag{1}$$

The discretionary-based approach is used, following Larcker and Richardson (2004, pp. 634). The discretionary portion of accruals (DACC) is identified for a given IPO firm as a residual from the following OLS method estimated model:

$$\frac{TACC_t}{TA_{t-1}} = \beta_0\left(\frac{1}{TA_{t-1}}\right) + \beta_1\left(\frac{\Delta SALES_t - \Delta AR_t}{TA_{t-1}}\right) + \beta_2\left(\frac{PPE_t}{TA_{t-1}}\right) + \beta_3\left(\frac{BV_t}{MV_t}\right) + \beta_4\left(\frac{CFO_t}{TA_{t-1}}\right) + \varepsilon_t \tag{2}$$

where ΔAR is the difference in accounts receivable during the year, and PPE is gross property, plant, and equipment at the end of the year. The ratio of the book-to-market value of common equity (BV/MV) and CFO are

added as control variables to Dechow *et al.*'s (1995, pp. 193–225) commonly-used model, because it is likely that the motivation to manage earnings changes in response to the growth opportunities and current operating performance. Such an approach is beneficial because it additionally makes it possible to include industry-year specific coefficients in the study (Larcker & Richardson, 2004, pp. 634–635).

To avoid the IPO companies' heterogeneity, each coefficient in the four models outlined above is estimated according to the size of the firm, i.e., lagged total assets (Ecker *et al.*, 2013, pp. 190–211). Hence, the study sample is divided into 10 separate groups of a similar size; then, the models are estimated separately in the cross-section for each decile group. To eliminate heteroscedasticity in the error term, the variables in the models are deflated by the lagged total assets (TA_{t-1}) (Han *et al.*, 2010, pp. 123–141; Tucker & Zarowin, 2006, pp. 251–270).

Results

Table 1 presents the mean values of the estimated coefficients for explanatory variables used to determine the normal levels of the operating cash flows, discretionary expenditures, production costs, and total accruals. Generally, almost all of the mean coefficients are significant. The only two exceptions are the mean values of the coefficients for the changes in sales (ΔSALES) in the production cost model (PROD) and the operational cash flow (CFO) in the total accruals model (TACC) for the year prior to the IPO.

For the mean adjusted R^2, there is a distinct difference between particular models. The highest average value is reported for both models that refer to production costs, and these results are quite similar to those presented by Roychowdhury (2006). In turn, the other two models that refer to the real earnings management have much lower values of R^2. The regression estimates describing the value of total accruals have substantial explanatory power. The mean adjusted R^2 is 46.22% and 44% for the period before and after the IPO year, respectively.

Table 2 reports the descriptive statistics of residuals from models 1–4, describing real and accrual-based earnings management in the years around the IPO. Figures 2 and 3 additionally emphasize the scope of earnings management in the years around the IPO, using confidence intervals for mean and quartiles, respectively.

Before the IPO, earnings management activity is very diverse among the whole sample. Based on the three measures of real earnings management,

on average, it varies between 0.0012 and -0.0139. The discretionary expenditures measure takes the highest for mean and standard deviation values, amounting to -0.0139 and 0.4515, respectively, with a median of -0.0472. The average (median) discretionary portion of accruals amounts to 0.0029 (-0.0205). It varies between -1.4690 and 3.0318, with a standard deviation of 0.3380. Although the average and median values are relatively low, all measures of earnings management differ widely across companies.

In the year following the IPO, several interesting facts emerge. First, although the means and medians for all earnings management proxies are still close to 0, the differentiation across the companies decreased significantly. Second, considering all measures of real earnings management, the operating cash flows proxy has the highest average, i.e., 0.0035. However, when the median is considered, again, the abnormal discretionary expenditures takes first place. Third, the average discretionary accruals amount to 0.0106, and it is the highest in comparison to the mean values reported for real earnings management measures.

Table 3 summarizes the comparisons between the different earnings management activities in the year before and after the IPO. After the IPO, there is a noticeable decrease in both the average and the median for almost all forms of earnings management investigated. An exception is the production costs measure, where the average remains unchanged and amounts to 0.0000. Nevertheless, almost all of the observed changes are not statistically significant. Only the difference in the median of the abnormal discretionary expenditure is significant at 10%.

An additional outcome of the research is the assessment of the relationship between the use of particular forms of earnings management. Table 4 provides the Pearson correlation estimates among the different proxies of earnings management used in the study with their statistical significances. Regardless of whether before or after the IPO, negative and significant correlations exist between abnormal production costs and other types of real earnings management. In particular, this relationship is extremely strong between discretionary expenses and extraordinary production costs in the year before the IPO (-0.7217, Pearson, p-value<0.01). This negative correlation can be explained by the fact that managers may use both forms of real earnings management interchangeably to achieve a particular goal. This finding is in line with previous studies (Ipino & Parbonetti, 2016, pp. 91–121). After the IPO, this negative correlation persists and remains statistically significant. However, it is not as strong as it used to be. In addition, there is a significant negative correlation between discretionary accruals and the abnormal production cost in the year following the IPO (-0.1480, Pearson, p-value<0.05).

Discussion

This study evaluated the use of four forms of earnings management (abnormal values of production costs, discretionary expenditures, operating cash flows, and discretionary accruals) in two different periods, i.e., before and after an IPO. Such an approach to the issue is almost absent in the literature, with existing research focusing largely on discretionary accruals in the year of the IPO. This has been met with considerable criticism and raises many controversies (Armstrong *et al.*, 2016, pp. 1316–1338).

The analysis of earnings management before an IPO suggests that managers do indeed take action in this area. The use of accruals is well documented (Dechow *et al.*, 2010, p. 384), and these results are not significantly different from those reported for other markets. The previous evidence suggests a conservative approach to using discretionary accruals before going public (e.g. Ball & Shivakumar, 2008, pp. 324–349). These conclusions, however, contradict the results presented by Premti and Smith (2020), who report positive discretionary accruals before the IPO.

Lizińska and Czapiewski (2018) confirmed a conservative picture of the Polish market regarding the use of discretionary accruals. However, the use of these tools by new stock companies is on a greater scale. This discrepancy is most likely due to the use of different earnings management detection methods. This study contributes to the literature by expanding the knowledge of other managerial activities. However, it should be noted that real actions in this area are more relevant before the IPO. Similar observations were made by Alhadab *et al.* (2016, pp. 849–871), who analyzed the UK stock market. They provided evidence that IPO firms manage earnings upward by engaging in real activities.

This research provides additional insights into the scale and form of earnings management in the year following an IPO. These findings suggest an increase in the role of discretionary accruals after the IPO. This is consistent with Cheon *et al.*'s (2011, pp. 627–657) evidence that companies engage in this type of earnings management after an IPO, and that earnings overstatement using discretionary accruals continues through to year +1. Unfortunately, this study does not compare the discretionary accruals scale to the period before the IPO. Therefore, the scale of changes is not examined. Lizińska and Czapiewski's (2018) study of the Polish IPO market is also a reference, but the results in this paper indicate a different direction of discretionary accruals use. However, due to the different way the research sample was built, these results cannot be compared directly. Unfortunately, the post-IPO use of real earnings management remains largely a mystery and certainly requires intensive research, especially for developing markets.

Conclusions

This paper investigated the relationships between the changes in a company's institutional market environment around an IPO and the scale of managerial activity towards inflating earnings, revenue, or total assets. It considered both accrual and real earnings management. This issue is particularly important for stock market investors, as reliable financial information is the basis for effective capital allocations. The excessive use of earnings management before an IPO may destroy the company's value and lead to severe economic consequences, both on micro and macro scales.

The empirical analysis of 183 Polish IPOs shows that before and after becoming a stock listed company, there are no statistically significant differences in mean values of particular methods of earnings management. However, the scope of managers' intentional influence on reported financial results is significantly smaller after the IPO. The results support the hypothesis that prior to the first listing of the company's shares on the stock exchange, managers more often employed activities typical of the real sphere of the company's business operations, in particular, intentional modeling of discretionary expenditures. In turn, after the stock exchange debut, the use of discretionary accruals is relatively more often put into action. Therefore, hypothesis 2 is supported, as well. Additionally, the analysis also shows that there are substitutional relations between the use of particular techniques of intentionally influencing reported financial results.

The analysis of earnings management around an IPO presented in this paper has its limitations, which creates great potential for further research. This study was limited to assessing the use of specific methods of earnings management and its measurement. The methodological approach used relates to the scale of the development of the Polish stock exchange. Because there are many ways in which managers can manipulate earnings, earnings management has been quantified in numerous ways in the literature (Man & Wong, 2013, pp. 391–418). The use of alternative solutions may reveal other aspects of using such management practices during the transformation from private to public ownership. Considering the ongoing globalization of capital flows on international financial markets, research on stock markets in other countries could also provide useful information to investors. Qualitative studies assessing managers' willingness to manage earnings before and after starting the IPO process could be of particular interest.

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Annex

Table 1. Mean values of the estimated parameters of the regression function in particular earnings management models

CFO		DISC_EXP		PROD		TACC	
Tpre-IPO							
β_1	5815.65***	β_0	0.0089	β_0	–0.0508	β_0	27310.16***
β_2	0.0097**	β_1	16437.19***	β_1	20661.00***	β_1	–0.0449***
β_3	0.0393***	β_2	0.1105***	β_2	0.8768***	β_2	–0.3002***
				β_3	–0.0186	β_3	0.1964***
				β_4	–0.0653***	β_4	–0.0874
Adj R^2	0.2839		0.1605		0.9192		0.4622
Jarque-Bera	0.9043		0.2852		0.5128		2.8907
White	1.4183		1.2510		2.6298		2.0598
Ramsey RESET	21.7415***		2.1958		0.4136		0.0403
Tpost-IPO							
β_1	3990.30***	β_0	–0.1118***	β_0	–0.0258	β_0	49390.81***
β_2	0.0331***	β_1	45446.03***	β_1	18503.67***	β_1	–0.0172**
β_3	–0.0630***	β_2	0.1382***	β_2	0.7983***	β_2	–0.1668***
				β_3	0.1723***	β_3	–0.0405***
				β_4	0.1727***	β_4	–0.7326***
Adj R^2	0.1588		0.1990		0.8800		0.4400
Jarque-Bera	1.9282		1.0441		4.8171*		0.9983
White	2.1809		13.0753***		0.4294		0.8874
Ramsey RESET	0.0000		1.4326		12.8265***		0.0354

*, **, and *** represent statistical significance at 10%, 5%, and 1% levels, respectively.

Table 2. Summary statistics for particular methods of earnings management analyzed in the study

Specification	Mean	Median	Std. dev.	Min	Q1	Q3	Max	N
Tpre-IPO								
CFO	0.0012	–0.0038	0.2036	–1.0692	–0.0890	0.1036	0.9687	183
DISC_EXP	–0.0139	–0.0472	0.4515	–1.2936	–0.1399	0.0675	4.4966	183
PROD	0.0000	0.0051	0.3946	–3.5683	–0.0971	0.1318	1.1552	183
TACC	0.0029	–0.0205	0.3380	–1.4690	–0.0748	0.0533	3.0318	183
Tpost-IPO								
CFO	0.0035	–0.0030	0.1428	–0.4893	–0.0781	0.0729	0.9962	183
DISC_EXP	0.0000	–0.0184	0.2216	–0.7049	–0.0827	0.0525	1.9632	183
PROD	0.0000	0.0228	0.2533	–2.0028	–0.0625	0.1064	0.6606	183
TACC	0.0106	0.0050	0.3022	–0.9326	–0.0683	0.0571	3.2880	183

Table 3. Comparison of differences in the mean and median of real and discretionary earnings management

Specification	*Tpre-IPO*		*Tpost-IPO*		Difference		N
	Mean	Median	Mean	Median	Mean	Median	
CFO	0.0012	–0.0038	0.0035	–0.0030	–0.0024	–0.0008	183
					(–0.1225)	(0.0836)	183
DISC_EXP	–0.0139	–0.0472	0.0000	–0.0184	–0.0139	–0.0288	183
					(–0.3775)	(1.7880*)	183
PROD	0.0000	0.0051	0.0000	0.0228	0.0000	–0.0176	183
					(0.0000)	(0.1965)	183
DACC	0.0029	–0.0205	0.0106	0.0050	–0.0077	–0.0256	183
					(–0.2167)	(0.7484)	183

t-statistics (t-test of difference in means) and z-statistics (Wilcoxon rank-sum test of difference in medians) in parentheses.
*, **, and *** represent statistical significance at 10%, 5%, and 1% levels, respectively.

Table 4. Correlation matrix: Pearson correlation coefficients

Specification	CFO	DISC_EXP	PROD	TACC
CFO	1.0000	0.0832	–0.3654***	0.0033
DISC_EXP	–0.0960	1.0000	–0.2481***	0.0042
PROD	–0.1970***	–0.7217***	1.0000	–0.1480**
TACC	–0.0251	–0.0114	–0.0336	1.0000

The upper-triangular part reports the correlation coefficients for one year after the IPO and the bottom-triangular part reports the correlation coefficients for one year before the IPO.

Figure 1. Timeline of the corporate governance perspectives around the period of the IPO

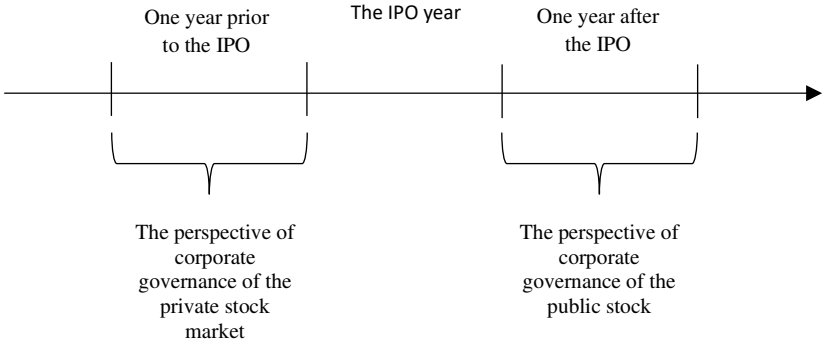

Figure 2. The scope of using earnings management techniques prior to the IPO (T-1) and after (T+1): confidence intervals

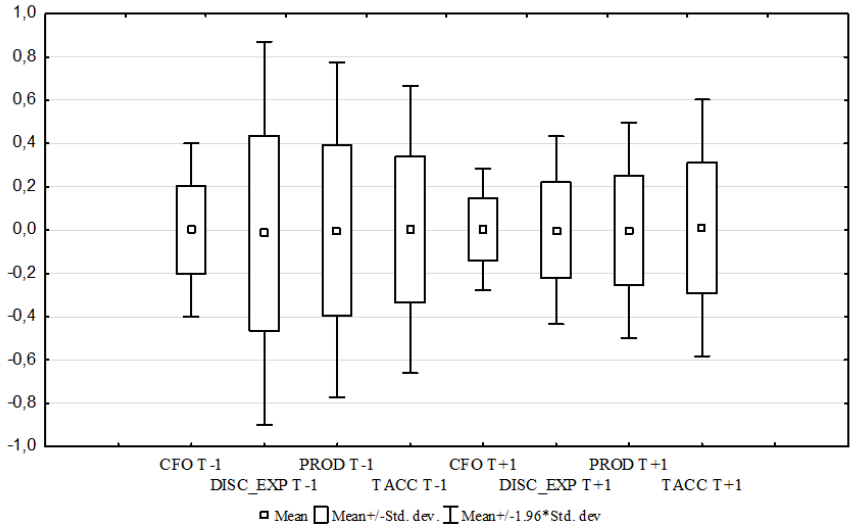

Figure 3. The scope of using earnings management techniques prior to the IPO (T-1) and after (T+1): quartiles