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Earnings management and the floatation structure: empirical evidence from Polish IPOs

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Abstract

Research background: Firms use discretionary accounting choices to manage earnings disclosures around the time of certain types of corporate events. The initial public offering particularly provides an opportunity to earnings management because of the significant information asymmetry between investors and issuers at the time of the offering.

Purpose of the article: The main aim of the study is to empirically investigate the links between the earnings management and the portions of primary and secondary shares sold in IPO.

Methods: In order to investigate whether the earnings management influences the issue of new shares and the sale of secondary shares I use Tobit and logit regressions, where discretionary accruals are the proxy for earnings management.

Findings & Value added: Using a sample of 221 firms from Warsaw Stock Exchange between 2005 and 2015 I do not find evidence that the increase of pre-IPO discretionary accruals positively affects the sale of primary shares in the IPO, but the analysis has revealed that the deliberate conservative reporting limits the probability of the new shares issuance. In turn, the sale of secondary shares by the original shareholders in IPO is more likely in companies using a conservative earnings management. Furthermore, negative discretionary accruals increase the portion of secondary shares sold in the IPO.

Introduction

Initial public offering (IPO), as the one of the most important corporate events for many companies, met with great interest of the scientists and the various aspects of this issue are subjected to a thorough analysis. Since it is widely believed that the company's earnings are the leading information item provided in financial statements (Ducharme *et al.*, 2004, p. 27) and play the crucial role of a signal optimally directing resource allocation in capital markets (McKee, 2005, p. 1), earnings management is a leading issue in the financial accounting literature (Zarowin, 2015, p. 2) and this aspect of going public process also has its rightful place in the literature.

Managers of issuing firms (IPOs) take various action in order to attract investor interest in new issues and to boost offer prices before the IPO. Numerous scientific studies such as Teoh *et al.* (1998, pp. 1935–1974) and Ducharme *et al.* (2004, pp. 27–49) indicate that the practice of earnings management, which is focused on improving the fundamentals determining the price of shares, is quite widely used in the period preceding the IPO. However, recent research results seem to challenge those findings (Roosenboom *et al.*, 2003, pp. 243–266; Ball & Shivakumar, 2008, pp. 324–349; Venkataraman *et al.*, 2008, pp. 1315–1345).

IPO as a strategy of shaping the size and structure of the company's equity is determined by a number of different factors, recognition and assessment of which allow for fuller understanding and explanation of some actions of certain participants of the capital market. In this context, the issue of motives for going public is particularly important. As Huyghebaert and Hulle (2006, p. 318) indicate, the source of the shares sold in the IPO, that is newly created shares sold by the company and the outstanding shares sold by existing shareholders, actually distinguish subgroups of firms with different objectives for listing. The sale of primary shares in the IPO provides an opportunity to increase the company's resources and strengthen its capital base. In turn, offering the secondary shares in IPO allows original shareholders to reduce their capital commitment in the company and receive the proceeds from the sale of shares.

The main aim of this study is the empirical evaluation of the relationship between using earnings management in the year prior to the first listing of the company's shares on the stock exchange and the decision on the sale of primary and secondary shares in the IPO. In both situations, when the purpose of the IPO is to raise additional funds to the company, as well as if existing shareholders want to sell shares in order to cash out and cut back their holdings, there is an incentive to take actions to increase the issue price and earnings management can be put into action.

In this paper, I address two central questions. The first one regards the source of shares sold in the IPO. Specifically, whether the use of earnings management prior to going public determines the type of shares sold in the IPO. In this part of the study, I analyze the links between the use of pre-IPO earnings management and the decision to issue new shares and the decision of company's shareholders on the sale of shares held by them. So, in this way, I investigate the relationships between the implementation of earnings management and the general motives for going public such as raising additional capital to the company or execute the divestment process. The second research question expressed in this study refers to the scale of the sale of primary and secondary shares in the IPO, than it is: how earnings management affects the scale of the issuance of new shares and the scale of the secondary shares sale by shareholders in the IPO. Therefore, it can be expected that the extent to which earnings were intentionally shaped in the period preceding the IPO will be associated with the demand for additional capital into the company submitted by the managers and the shareholders' desire to exit their earlier investment in this firm. Thus, a direct expression of the intensity of these needs is the portion of primary and secondary shares sold in the IPO.

This paper refers to two influential studies on source of shares sold in IPO, that is Huyghebaert and Hulle (2006, pp. 296–320), and Klein and Li (2009, pp. 1194–1212), but it differs from them in a few essential ways. Huyghebaert and Hulle (2006, pp. 296–320) examine the determinants of the portions of primary and secondary shares sold in IPO, but they do not address the earnings management activities. The increase in the price of shares offered in the IPO induced by the inflated earnings may significantly influence the sale of newly created shares by company or existing securities by original shareholders. Moreover, not only does my research concern the floatation structure, but the subject of the analysis is also the very fact of the taking decision to issue new shares or to sale shares by existing shareholders. In turn, Klein and Li (2009, pp. 1194–1212) analyze pre-IPO window-dressing in the context of the source of shares sold in the IPO, but they limit their research to the issue of secondary share offerings. In contrast to this study, I additionally investigate the relationship between earnings management and the sale of primary shares. Moreover, they use a modified version of Jones's (1991, pp. 193–228) model to calculate current discretionary accruals as a proxy for window-dressing, while I use the Larcker and Richardson (2004, pp. 625–658) model, which is more suitable for the evaluation of earnings management in companies with high growth potential. What is more, the distinctive feature of my study and the additional byproduct of the analysis is to recognize the use of earnings management in

the going public process on the Polish stock market. The existing knowledge in this area is very limited.

The remainder of the paper is structured as follows. The next section reviews the results of previous research on the issue of earnings management in the context of IPO and develops hypotheses. Section 3 contains a description of the sample and research design. Section 4 offers the results of an empirical analysis of the relationship between earnings management and the sale of primary and secondary shares in the IPO. Finally, section 5 presents concluding remarks.

Earnings management in IPO: evidence from prior research and hypotheses development

According to the most commonly presented approach of Healy and Wahlen (1999, p. 368), earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers. Teoh *et al.* (1998, p. 1937) emphasize that IPO provides an excellent opportunity to the effective use of earnings management, because an inherent feature of this process is the presence of the significant information asymmetry. Prior to the IPO, the information gap is relatively large, which stems from the little public media coverage and limited access to information on the company. While it does exist at the time of the IPO and inside investors are typically better informed than outside investors in the capital market, the scale of this information superiority vanishes over time (Neus & Walz, 2005, p. 254).

Numerous empirical studies have investigated the use of earnings management by IPO firms, but their mixed results do not allow to draw clear conclusions. On the one hand, prior studies of Teoh *et al.* (1998, pp. 1935–1974), DuCharme *et al.* (2004, pp. 27–49) suggest that earnings management tends to be used in companies around the IPO in order to raise reported earnings. Issuers adopt such accounting accrual adjustments, because inflated earnings are translated directly into a higher offering price and positively relate to the initial firm value. On the other hand, a growing body of literature indicates that the pre-IPO abnormal accruals are not the result of the opportunistic behavior of insiders, but arise from the effective use of growth potential of such companies. Moreover, because financial information in prospectuses are a subject of intense scrutiny, it discourages aggressive earnings management and makes IPOs more likely to report less

and more conservatively in this crucial period (Ball & Shivakumar, 2008, pp. 324–349; Venkataraman *et al.*, 2008, pp. 1315–1345). In addition, Armstrong *et al.* (2016, pp. 1316–1338) find no evidence of a relation between abnormal accruals and inflated issue price, inflated post-IPO equity values, and increased insider trading profits.

Earnings management is likely to influence the floatation structure. Considering issues of new shares, the managers of IPOs may deliberately report high earnings in order to raise additional capital to the company from the stock market. Linck *et al.* (2013, pp. 2117–2143) indicate that the reducing the firm's financial constraints may be the goal of the earnings management, because this kind of actions increase the possibility of obtaining external capital. If the positive relationship between the IPO offer price and intentionally increased reported earnings exists (as for example Teoh *et al.* (1998, pp. 1935–1974) suggest), managers can adopt aggressive earnings management to raise extra funds and achieve adopted goals in the future without the threat of occurrence of significant financial constraints and shortage of capital. Based on this, I posit the following hypothesis:

H1: The sale of primary shares in IPO is positively related to the earnings increasing management activity.

As far as the sale of secondary shares in the IPO is concerned, creation of the firm's initial value by earnings management may have a significant impact on the decisions of the original shareholders regarding the maintenance of their capital commitment in the equity of the company. The implied increase in the IPO offer price makes that implementation of exit strategy becomes more attractive to pre-IPO shareholders at this point. For example, Darrough and Rangan (2005, pp. 1–33) show that decline of current reported earnings before IPO due to an increase in R&D spending is negatively correlated with insider selling. Klein and Li (2009, pp. 1194–1212) provide evidence of positive correlation of window-dressing as measured by discretionary current accruals with secondary share offerings. This leads me to posit the following hypothesis:

H2: The sale of secondary shares in IPO is positively related to the earnings increasing management activity.

However, the research shows that for shareholders seeking to sell their holdings the IPO only starts the divestment process and the relevant reduction of the capital commitment in company occurs generally at a later date (Cumming & MacIntosh, 2003, pp. 511–548; Paeglis & Veeren, 2013, pp.

104–123; Sosnowski, 2015, pp. 527–538). The offering of secondary shares in the IPO aims mainly at increasing the liquidity of shares (Huyghebaert & Hulle, 2006, p. 313–314). The issue is of particular importance for such market participants as private equity funds (Nahata, 2008, pp. 127–151; Hsu, 2004, pp. 1805–1844). A too aggressive policy of earnings management before first listing of company shares on the stock exchange, can generate negative effects, because the implied increase in the initial value of the company is not sustainable. In the long term, IPOs that window-dress exhibit significant negative stock changes and decline in operating performance (DuCharme *et al.*, 2004, pp. 27–49; Xie, 2001, s. 357–373). The implementation of such opportunistic strategy could spoil the market reputation of the company and would prevent a later profitable sale of shares held by its original owners. Thus, the bigger incentives to inflate earnings do not arise before IPO, but it will occur after the first listing of company shares, when the lockup expires and subsequent sale of secondary shares is possible. Given that borrowing from future earnings encounters significant limitations and cannot be pursued indefinitely, you can expect that before the IPO, the company will report less, not more aggressively. Taking into account this argumentation, I posit an alternative to the H2 following hypothesis:

H3: The pre-IPO use of conservative earnings management is positively related to secondary shares sale in IPO.

Research methodology

Empirical studies aim to identify and characterize the relationship between the use of earnings management before the first listing of company's shares on the stock market and the decision on the sale of primary and secondary shares in the IPO. The sample consists of Warsaw Stock Exchange (WSE) IPOs that satisfy the following criteria:

- their shares were listed on the main market of the WSE for the first time between 2005 and 2015,
- their offer includes the sale of primary, secondary, or both primary and secondary shares,
- the company's shares were not previously publicly traded (e.g. New-Connect, MST-CeTo),
- foreign companies, banks and insurance companies are excluded.

From the total number of 372 new listings of Polish companies, 235 firms met these criteria. Then, from such a selected study sample I exclude

14 companies for which it was not possible to obtain the required data. The final sample includes 221 IPOs.

In the first stage of the study to assess the extent to which the pre-IPO earnings management practice is employed, I use discretionary accruals (DACC). For this purpose, it is necessary to decompose the total accruals (TACC) representing the difference between net earnings and cash flow from operation into their discretionary and non-discretionary part.

In order to estimate discretionary accruals, the vast majority of empirical studies use the Jones (1991, pp. 193–228) model, or its modified formula proposed by Dechow *et al.* (1995, pp. 193–225). However, both approaches have their limitations. Ball and Shivakumar (2008, pp. 324–349) note that those models are not entirely suitable for analysis of IPOs and lead to an overestimation of discretionary accruals. Therefore, to reach the aim of the study, I use Larcker and Richardson (2004, pp. 634) model, which is more appropriate for the assessment of accruals in growing companies:

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

where:

TA_{t-1} – total assets at the beginning of the year t ,

$\Delta SALES_t$ – change in sales from the previous to the year t ,

ΔAR_t – the difference in accounts receivable from the start to the end of the year t ,

PPE_t – gross property, plant, and equipment at the end of year t ,

BV/MV_t – the ratio of the book-to-market value of common equity at the end of the year t ,

OCF_t – cash flows from operations at the given period,

β_0, \dots, β_4 – the regression coefficients,

ε_t – the error term in a regression equation,

T – the fiscal year before the IPO year.

The outlined above model is an extension of a modified Jones (1991, pp. 193–228) model. The inclusion of the book-to-market ratio in the assessment of earnings management allows mitigating the effect of the accruals overvaluation resulting from the expected growth in the firm's operations, while the use of current operating cash flows as an additional independent variable helps to control the impact of the company's operating performance on its accruals.

A large body of research on earnings management use an approach in which accruals models are estimated in the cross-section for each industry in order to eliminate the heterogeneity of analyzed firms. However, as Eck-

er *et al.* (2013, pp. 190–211) emphasize, such an approach is not always the best choice, and recommend group companies in a relatively homogeneous sets according to the size of the firm, measured by lagged total assets. In this paper, I divide all analyzed IPOs into 10 separate groups of a similar size, and then estimate accruals models separately in the cross-section for each decile group.

In the applied approach, discretionary accruals are the difference between the company's asset-scaled total accruals and nondiscretionary accruals estimated on basis of the adopted model, which is represented by the residual:

$$\frac{DACC_t}{TA_{t-1}} = \frac{TACC_t}{TA_{t-1}} - \hat{\beta}_0 \left(\frac{1}{TA_{t-1}} \right) + \hat{\beta}_1 \left(\frac{\Delta SALES_t - \Delta AR_t}{TA_{t-1}} \right) + \hat{\beta}_2 \left(\frac{PPE_t}{TA_{t-1}} \right) + \hat{\beta}_3 \left(\frac{BV_t}{MV_t} \right) + \hat{\beta}_4 \left(\frac{OCF_t}{TA_{t-1}} \right) \quad (2)$$

The next stage of empirical research aims at recognizing the links between earnings management and the sale of primary and secondary shares in the IPO. The leading research methods used in the study for the diagnosis of the analyzed relationships are:

a) logistic regression model:

$$P(Y = 1 / x_1, x_2, \dots, x_k) = \frac{e^{\alpha_0 + \sum_{i=1}^k \alpha_i x_i}}{1 + e^{\alpha_0 + \sum_{i=1}^k \alpha_i x_i}} \quad (3)$$

in which the endogenous variable Y is a dummy variable PRIMARY (SECONDARY), which takes the value of one when new shares are issued in IPO (the original owners of the company sell secondary shares in IPO) and zero otherwise, and $P(Y = 1/x_1, x_2, \dots, x_k)$ is the conditional probability of obtaining the value of one by the dependent variable for the given values of the explanatory variables x_1, x_2, \dots, x_k ;

b) Tobit regression model:

$$Y = \begin{cases} Y = Y^* & \text{for } Y^* > 0 \\ Y = 0 & \text{for } Y^* = 0 \end{cases}, \text{ where } Y^* = \alpha_0 + \alpha_1 x_1 + \alpha_2 x_2 + \dots + \alpha_k x_k + \varepsilon \quad (4)$$

in which the dependent variable Y^* is PRIMARY (SECONDARY) PORTION, that is the ratio of number of the new issued (secondary) shares sold in the IPO relative to the total number of shares before the IPO, α_i for $i = 0, 1, 2, \dots, k$ is the regression coefficient, x_1, x_2, \dots, x_k refers to the next explanatory variables.

In the study, a group of essential variables, both in Logit and Tobit regression models, are constituted by some characteristics of the discretionary accruals use as a proxy of earnings management. First, I directly use information about the level of discretionary accruals for each company (DACC). However, because the use of specific policy of the intentional shaping of financial results, aiming at reducing or increasing reported earnings may differently affect the decision on the sale of primary and secondary shares in the IPO, I follow Teoh *et al.* (1998, p. 1948) to assess the type of earnings management strategy in individual firms. All analyzed companies were ranked according to the level of discretionary accruals in non-decreasing order, and then divided into four approximately equal groups (+/- 1 company). The first group consists of companies with the lowest discretionary accruals (below the first quartile) i.e. applying the conservative earnings management strategy. As a proxy of such a strategy I use a dummy variable $DACC < Q1$ that is set 1 when firm is classified to this group and 0 otherwise. I act in the same way identifying companies characterized by the highest level of discretionary accruals, in which the strategy of aggressive earnings management has been implemented. As previously, as a proxy I use $DACC > Q3$, which is a dummy variable, and equals 1 for firms in this group and 0 otherwise.

Regarding the conclusions from the literature priori research on factors affecting the sale of primary and secondary shares in the IPO, in the empirical studies I use a set of additional exogenous variables, controlling the influence of other factors on the floatation structure. Moreover, I add variables relating to the presence of shareholders in the ownership structure, which by their nature can be particularly interested in the sale of secondary shares, namely private equity funds and the State Treasury. Table 1 presents these variables.

The information on the type of shares sold in IPO i.e. primary and secondary shares are hand-collected from the *Register of financial instruments* maintained by the Polish Financial Supervision Authority. The data on assets and financial condition for each company come from the financial statements available in the *Notoria Service* database, whereas information on the age of the company and its significant shareholders are hand-collected from analyzed firms' prospectuses.

Results

Empirical research on the practice of IPO in the Polish stock market indicates that the decision to go public is connected with the wish to implement

a variety of strategic goals. Table 2 presents descriptive statistics on the types of shares (primary and secondary shares) offered in the IPO, which corresponds to the general objectives of the IPO and the amount of proceeds raised from their sale. In addition, this information is divided according to the floatation structure.

The information in Table 2 indicates that the dominant reason for going public on WSE is the need to raise new capital to the company. Among the whole sample in 120 companies only newly created shares were offered to the public, and in the following 74 companies the sale of primary shares was combined with the sale of shares by the original owners. Offerings connected exclusively to the sale of secondary shares on the Polish stock market are relatively rare. There are only 27 such IPOs. In the whole sample of 221 IPOs the average (median) number of primary shares sold to the public amounts to 26.82% (20.86%) of the shares outstanding pre-IPO. The average (median) amount of the raised capital resulting from issuance of new shares amounts to 86.64 million PLN (22.50 million PLN). Although the average secondary portion amounts to 11.27% and is relatively lower in comparison to the primary portion, the value of shares sold by existing shareholders per IPO is larger and amounts to an average of 106.20 million PLN.

Table 3 presents some descriptive statistics of the characteristics used in the study as variables for the full sample of 221 IPOs. The data indicates that the going public strategy is adopted by firms with the diversified profitability, varied size and structure of liabilities, often using various strategies of earnings management.

The figures in Table 3 relating to the applied strategies of earnings management show that companies which have decided to use discretionary accruals in order to increase the reported earnings slightly exceed among the whole sample. Although the discretionary accruals, on average, amount to only 0.0090 of total assets, it does not mean that Polish new stock companies have not put into practice earnings management before IPO. The level of this variable is significantly varied and ranges from -0.3377 to 0.6094, with the median of 0.0011.

In order to recognize which of the characteristics used as explanatory variables affect the type of shares offered to investors, I estimate six logit models, which are presented in Table 4. As the observed values of predictors differ widely across companies, in order to reduce the impact of outliers all variables are winsorized at 5-95%, i.e. extreme data values are replaced by adequate percentiles.

The results presented in Table 4 indicates that the use of earnings management before the IPO affects the likelihood of the sale of the specified

type of shares only in certain cases. Across the proxies for earnings management only coefficients on $DACC < 0$, relating to the adoption of the conservative reporting policy, are statistically significant. For the issuance of new shares, the coefficient on $DACC < 0$ is negative and statistically significant at the level of 1%. It indicates that the intentional reporting less in the period preceding going public reduces the likelihood of the sale of primary shares in the IPO. In turn, there is a positive relationship between the intentional conservative reporting by negative discretionary accruals and the reduction of the original shareholders' holdings. Consistent with hypothesis 3, the coefficient on $DACC < 0$ is positive and significant at the 0.05 level.

The data show that the issuance of new shares is more likely in the case of smaller companies with lower profitability. Moreover, these companies are willing to exploit the favorable market conditions to issue new shares. In turn, the figures show that in the case of older, larger, characterized by the higher profitability and market-to-book ratio firms there is a greater likelihood of a positive decision on the sale of secondary shares by initial shareholders in the IPO.

It is worth noting that the results indicate a significant influence of private equity funds on the type of shares offered to the public in the IPO. If a private equity fund is one of the original shareholders, it increases the probability of the sale of secondary shares and, in turn, limits the likelihood of creating new issued shares in the IPO. The coefficients on PE are statistically significant at the level of 0.01 in all six models. It clearly shows that going public is considered as an exit strategy by private equity funds.

The next part of the research focuses on the analysis of the links between the use of discretionary accruals and the scale of sale of secondary shares, as well as newly created shares. Table 5 presents the results of analysis using Tobit regression.

The results explaining the primary portion in Table 5 do not indicate the existence of the relationship between the scale of the issuance of new shares and the use of discretionary accruals before the IPO. The coefficients on all three proxies of earnings management are statistically insignificant. In contrast, the adoption of conservative reporting strategy prior to the IPO results in the increased scale of secondary shares sale. In this case the coefficient on $DACC < 0$ is positive and significant at the 0.01 level. Again $DACC$ and $DACC > Q3$ lack statistical significance.

The data in Table 5 provide additional evidence that smaller companies, characterized by lower profitability and lower growth potential are not only more likely to create new shares when they go public, but the proportion of primary shares offered in the IPO is also larger. Moreover, the growth of the firm's debt promotes the increase of the issuance scale, which is in line

with the findings of Pagano *et al.* (1998, pp. 27–64), according to which companies go public to reduce their risk by rebalancing of financial structure. In addition, these companies are willing to use favorable market conditions to raise additional funds. In contrast, the presence of private equity fund among the shareholders negatively affects the primary shares portion in the IPO. If the fund seeks to exit the investment, it can use its privileged position to reduce the scale of new shares issuance and offer to the public, in exchange, the secondary shares from its investment portfolio.

Based on the information presented in Table 5, one can see that there is a statistically significant, positive link between the firm size, age and portions of secondary shares sold in the IPO. So, the data are in line with the asymmetric information idea that the existing shareholders are more likely to sell their shares when information asymmetry between existing shareholders and new stock investors is low (Lowry, 2003, p. 7). Furthermore, the higher profitability also positively affects the growth of the secondary portion, as it positively contributes to the market valuation of the company.

Conclusions

In this paper I investigate the links between earnings management in the period preceding the company's going public and the decision on the sale of primary and secondary shares in the IPO. The results of empirical studies suggest that the IPO favors the earnings management. However, the actions observed in this field are differently oriented. Among the surveyed IPOs, there are companies which, by earnings management, tried to improve the financial results presented to the public, as well as firms with negative discretionary accruals.

The empirical research allows me to formulate the following conclusions. Firstly, the data do not show that managers of new stock companies use an aggressive strategy of earnings management prior to the IPO to raise additional financing to the company. However, although I do not find evidence that the increase of pre-IPO discretionary accruals positively affects the sale of primary shares and its scale in the IPO, the analysis has revealed that the deliberate conservative reporting limits the probability of the new shares issuance. Secondly, as far as selling actions of initial shareholders is concerned, inflating earnings do not encourage reducing their shareholding in the company. On the contrary, the sale of secondary shares occurs in companies with the lowest discretionary accruals before the IPO i.e. the ones using a conservative earnings management strategy. This suggests that shareholders with the intention of cut back their holdings tend to report less

before the IPO, anticipating the possible negative consequences of window-dressing. Furthermore, intentional conservative reporting increases the portion of secondary shares sold in the IPO. This is possibly due to the fact that such IPOs may struggle with the negative consequences of reduced liquidity of the stock, as the negative discretionary accruals decrease the probability of the primary shares offering.

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Annex

Table 1. Symbols and description of the control variables

Variable	Description
DR	The debt-to-assets ratio.
ROA	Return on assets.
TC	Total assets* [in millions of PLN].
AGE	Age of the company at the IPO*.
MV/BV	Market capitalization scaled by the book value of equity before IPO
HOT	Dummy variable which takes the value of 1 if in the year of the firm's IPO there is more new companies on the WSE than the average in the whole study period (including only companies qualified to the sample), and 0 otherwise.
PE	A dummy variable that takes the value 1 when the private equity fund is a shareholder of the company at the time of the IPO, and 0 otherwise.
STATE	A dummy variable that takes the value 1 when the State Treasury is a shareholder of the company at the time of the IPO, and 0 otherwise.

*In logit and Tobit regressions I use natural logarithm (Ln) of this variable.

Table 2. Summary statistics for offering types and proceeds

Specification	Mean	Median	Std. dev.	Min	Max	Q1	Q3
Pure primary offerings N=120							
Primary portion	0.3383	0.2649	0.2741	0.0034	1.8956	0.1751	0.4322
Primary proceeds	124.08	26.72	599.49	0.14	5968.81	13.36	51.90
Pure secondary offerings N=27							
Secondary portion	0.4044	0.3629	0.2379	0.0587	1.0000	0.2520	0.4888
Secondary proceeds	704.82	178.20	1290.43	35.81	5371.48	58.72	568.75
Combined offerings N=74							
Primary portion	0.2525	0.2000	0.1981	0.0504	1.1896	0.1255	0.3250
Primary proceeds	57.55	29.60	66.70	3.75	370.50	18.54	70.54
Secondary portion	0.1890	0.1507	0.1586	0.0082	1.0000	0.0801	0.2628
Secondary proceeds	60.01	26.56	113.78	0.74	689.00	10.33	46.46
Proceeds in total	117.56	67.42	167.01	5.43	1059.50	31.25	103.75
Whole sample N=221							
Primary portion	0.2682	0.2086	0.2554	0.0000	1.8956	0.1000	0.3569
Primary proceeds	86.64	22.50	444.79	0.00	5968.81	9.61	52.50
Secondary portion	0.1127	0.0000	0.1854	0.0000	1.0000	0.0000	0.1660
Secondary proceeds	106.20	0.00	501.94	0.00	5371.48	0.00	34.79
Proceeds in total	192.85	43.05	661.13	0.13	5968.81	20.00	97.38

Proceeds is the number of shares times the offer price [in million PLN].

Table 3. Descriptive statistics of the explanatory variables

Specification	Mean	Median	Std. dev.	Min	Max	Q1	Q3
DACC	0.0090	0.0011	0.1239	-0.3377	0.6094	-0.0520	0.0683
DR	0.5157	0.5458	0.2559	0.0058	2.3219	0.3399	0.6699
TC	541.15	76.21	2237.45	0.29	21762.09	28.82	213.21
ROA	0.1226	0.0871	0.1274	-0.0984	0.8170	0.0451	0.1595
AGE	23.47	15.00	25.44	3.00	149.00	9.00	23.00
HOT	0.6063	1.0000	0.4897	0.0000	1.0000	0.0000	1.0000
PE	0.1719	0.0000	0.3782	0.0000	1.0000	0.0000	0.0000
STATE	0.0860	0.0000	0.2810	0.0000	1.0000	0.0000	0.0000
MV/BV	7.08	3.77	13.95	-103.63	88.30	1.83	8.31

Table 4. Determinants of the likelihood of primary and secondary shares sale in the IPO – Logit regression results

Specification	Sale of primary shares			Sale of secondary shares		
Intercept	21.0118 (4.2014) ***	27.2524 (4.3416) ***	20.6000 (4.2682) ***	-10.6321 (-4.6936) ***	-11.8087 (-5.0261) ***	-10.1716 (-4.6637) ***
DACC	1.9341 (0.4955)			-1.7798 (-0.9280)		
DACC<Q1		-2.7649 (-2.7037) ***			0.9603 (2.3480) **	
DACC>Q3			0.4913 (0.6697)			-0.2134 (-0.5055)
DR	0.4854 (0.3283)	1.5232 (0.9519)	0.5468 (0.3673)	-0.7989 (-0.8565)	-0.8304 (-0.8877)	-0.7113 (-0.7645)
ROA	-11.2486 (-2.6635) ***	-14.5114 (-3.3635) ***	-11.2137 (-2.8294) ***	8.2264 (3.6482) ***	8.8751 (4.1585) ***	7.6842 (3.5467) ***
ln(TC)	-1.3433 (-3.6654) ***	-1.7657 (-3.9757) ***	-1.3344 (-3.7694) ***	0.6582 (3.7062) ***	0.7148 (3.9962) ***	0.6280 (3.6361) ***
ln(AGE)	-0.3914 (-0.9295)	-0.4985 (-1.1358)	-0.3431 (-0.7920)	0.5631 (2.2718) **	0.6283 (2.4651) **	0.5501 (2.2188) **
MV/BV	-0.0717 (-1.1848)	-0.0808 (-1.2370)	-0.0694 (-1.1388)	0.1048 (2.9969) ***	0.1103 (3.1260) ***	0.1018 (2.9258) ***
HOT	1.7963 (2.6654) ***	2.0398 (2.8748) ***	1.7817 (2.6464) ***	-0.0120 (-0.0326)	-0.0336 (-0.0895)	-0.0211 (-0.0574)
PE	-2.3850 (-3.5522) ***	-3.0500 (-3.8667) ***	-2.3281 (-3.5117) ***	1.9561 (4.1168) ***	2.0086 (4.2260) ***	1.9370 (4.0661) ***
STATE	-1.0947 (-1.2324)	-1.0275 (-1.1306)	-1.0579 (-1.1850)	-0.6528 (-0.9849)	-0.5950 (-0.8956)	0.6132 (-0.9257)
LR stat	74.3537	82.5265	74.5648	65.5874	70.4098	64.9751
p-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Numbers in parentheses are z-statistics. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 5. Determinants of the portions of primary and secondary shares – Tobit regression results

Specification	Primary portion			Secondary portion		
Intercept	1.1371 (6.5983)***	1.2127 (6.9755)***	1.1379 (6.8585)***	-1.1606 (-4.9870)***	-1.2807 (-5.4692)***	-1.1213 (-4.9079)***
DACC	0.0341 (0.2126)			-0.1855 (-0.9195)		
DACC<Q1		-0.0530 (-1.5768)			0.1120 (2.7543)***	
DACC>Q3			0.0362 (0.9958)			-0.0175 (-0.3912)
DR	0.2207 (2.8241)***	0.2242 (2.9062)***	0.2303 (2.9479)***	0.0021 (0.0216)	-0.0027 (-0.0282)	0.0095 (0.0967)
ROA	-0.4357 (-2.4082)**	-0.4956 (-2.9536)***	-0.4863 (-2.7789)***	0.8727 (3.8253)***	0.9502 (4.4507)***	0.8159 (3.6855)***
lnTC	-0.0773 (-5.5043)***	-0.0813 (-5.8685)***	-0.0786 (-5.7279)***	0.0721 (3.9719)***	0.0775 (4.3581)***	0.0694 (3.8801)***
lnAGE	-0.0174 (-0.8317)	-0.0211 (-1.0093)	-0.0152 (-0.7245)	0.0056 (2.1418)**	0.0632 (2.4451)**	0.0558 (2.1142)**
MV/BV	-0.0100 (-3.5271)***	-0.0103 (-3.6759)***	-0.0102 (-3.6238)***	0.0056 (1.5839)	0.0057 (1.6460)*	0.0054 (1.5152)
HOT	0.0659 (2.0739)**	0.0669 (2.1143)**	0.0659 (2.0786)**	-0.0134 (-0.3355)	-0.0128 (-0.3249)	-0.0147 (-0.3667)
PE	-0.1211 (-3.2440)***	-0.1236 (-3.3214)***	-0.1184 (-3.1711)***	0.2391 (5.5130)***	0.2461 (5.7599)***	0.2377 (5.4392)***
STATE	0.0452 (0.7324)	0.0456 (0.7469)	0.0512 (0.8305)	0.0398 (0.5698)	0.0443 (0.6524)	0.0429 (0.6114)

Numbers in parentheses are z-statistics. *, **, and *** represent statistical significance at the 10%, 5%, and 1% levels, respectively.