

Research Article

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Board characteristics and earnings forecasts accuracy in IPO prospectuses

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Abstract: Using a sample of 104 companies that conducted initial public offering (IPO) on the Warsaw Stock Exchange between 2006 and 2016, we investigated the relationship between the accuracy and bias of the earnings forecast disclosed in the IPO prospectus and the firm corporate governance attributes. Applying multiple Ordinary Least Squares (OLS) regressions models, we focused on the role of the board size, the percentage of women on the board, the board age diversity measure, and the proportion of shares owned by the members of the board. Generally, our findings show that some characteristics of management and supervisory board improve the usefulness of earnings forecasts' credibility. Especially, a more diversified board in terms of age and higher management ownership results in more accurate forecasts. This is the first study giving an insight into the role of supervisory and management board characteristics on precision of earnings forecasts revealed in the prospectus by Polish IPO companies.

Keywords: initial public offering, earnings forecast, management and supervisory board

JEL classification codes: G34, G32, G23

1 Introduction

Raising capital through the initial public offering (IPO) is not an easy task, because usually companies while seeking to be listed have a limited operating track record and little publicly available information on the company's quality exists [Badru et al., 2017, p. 37]. Such an information gap between issuers and investors creates for potential investors a high degree of uncertainty in the assessment and valuation of the company's prospects, which are to be considered at the time of an IPO [Roosenboom et al., 2003, p. 243]. Owing to a high degree of information asymmetries during the company's transition from private to public ownership, the risk of both adverse selection and moral hazard problems increases with regard to investment decisions [Florin and Simsek, 2007, p. 128]. Bearing in mind the negative consequences of the information asymmetry for successful listing, managers and pre-IPO shareholders may take various actions to mitigate its negative outcomes [Cohen and Dean, 2005; Yung and Zender, 2006].

Public information about an IPO issuer is scarce prior to the IPO and often limited to the prospectus that provides details of the business and the offering [Gounopoulos and Pham, 2018, p. 220]. To challenge the information asymmetry issue and mitigate its side effects, Bergh et al. [2014] put forward for consideration the use of observable firm characteristics, which are directly controllable by the firm at the time of the equity issue as signals [Downes and Heinkel, 1982] that can be used to diminish the information gap and reduce the uncertainty present in the IPO process. In prospectus, among numerous details referring to business activity, an issuer may voluntarily disclose information on its earnings forecasts. Publication of

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such forward-looking information is aimed at limiting the uncertainty of stock investors interested in the purchase of the company's shares in IPO [Jog and McConomy, 2003; Chong and Ho, 2007, p. 63; Bédard et al., 2016, p. 236]. Thus, the forecasts of financial results become a signal sent to the public about the future value of the company [Verrecchia, 1983]. In turn, Cohen and Dean [2005] suggest that one such observable means by which issuers can signal their quality to receive favorable valuation in the market is through the structure of their board of directors. Bertoni et al. [2014, p. 1] argue that a well-functioning board of directors contributes to the company value and its competitive advantage by monitoring the behavior of managers, providing valuable resources, giving strategic advice, enhancing the company's reputation, and expanding the company's network of business contacts. Therefore, the structure of the board of directors is a useful screening and sorting criterion that can have an impact on investors' perception of the company value in the investment decision [Badru et al., 2017, p. 37].

The main objective of this study was to analyze the relationship between the accuracy of the earnings forecast disclosed in the IPO prospectus and the firm corporate governance attributes. More specifically, we examine the effect of the pre-IPO management and supervisory board characteristics on the quality of management earnings forecast in companies going public and ask a question whether corporate governance regarded as board system features could have an impact on the accuracy of forward-looking financial information. In particular, we generally hypothesize that these relations between the board attributes and the earnings forecast error exist in the IPO process. An additional by-product of our analysis is the insight into the bias of such forward-looking information.

The extant literature in finance has documented that managerial behaviors have a significant impact on corporate decisions and performance. Two basic theories constituting a foundation in research on the key roles of the board of directors in executing a successful listing of a company can be pointed out. First, the resource dependence theory [Sharif and Yeoh, 2016; Hillman et al., 2000] makes a theoretical ground for the role of the board of directors in providing access to critical resources that would not be available otherwise [Badru et al., 2017, p. 38]. Second, according to the upper echelons theory [Hambrick and Mason, 1984], the background of top executives plays a pivotal role in shaping crucial organizational outcomes [Carpenter et al., 2004, p. 750], and managerial characteristics and experiences can have an effect on managers' decision-making [Gounopoulos and Pham, 2018, p. 218].

Although the influence of managerial characteristics on corporate decisions has received significant attention over the last few decades, there is still little known about this issue in emerging markets. Our key motivation for this study is twofold. First, most of empirical evidence comes from well-developed stock markets with a unitary board system, mainly the United States and the United Kingdom, and their results refer to companies that operate under different legal regimes and hence corporate governance systems. As a result, the substantial part of the abundant literature may not be conclusive for other countries. The lack of scientific research is especially noticeable in the field of management earnings forecast quality. Second, the conclusions drawn on the basis of a comprehensive cross-country analysis of influential studies highlight the need to explicitly consider the country geographic location when one analyzes the relation between board characteristics and voluntary disclosure [Samaha et al., 2015]. Owing to the form of the corporate governance system in Poland and the fact that the Polish public securities market plays a leading role in Central and Eastern Europe, companies seeking to be listed on the Warsaw Stock Exchange are a fairly illustrative example to research a voluntary disclosure in the two-tier board system, in which the management board is in charge of running a business on a day-to-day basis, while the supervisory board serves a monitoring function.

The rest of the paper is organized as follows. In section 2, we briefly review the corporate governance literature to develop testable hypotheses. Section 3 describes the sample and reports the data and methodology adopted in the empirical analyses. Section 4 presents a discussion of our key findings, while the last section summarizes and concludes.

2 Background and hypothesis development

Although the issue of accuracy and bias of earnings forecasts revealed in the IPO prospectuses has attracted attention of many researchers [e.g., Firth, 1998; Jog and McConomy, 2003], the literature on the relationship

between board characteristics and the quality of such financial projections is still very limited. The existing literature emphasizes that managers tend to disclose overoptimistic forecasts to show “overly optimistic picture of future earnings” [Tinaikar, 2012, p. 5], which could mislead the public. In order to increase the quality of forward-looking information issued by managers, effective governance mechanisms may be applied. This link is documented for US [Ajinkya et al., 2005; Karamanou and Vafeas, 2005; Tinaikar, 2012], Canadian [Tinaikar, 2012], or Taiwanese companies [Huang et al., 2012]. For instance, Ajinkya et al. [2005] report the greater the institutional ownership and the higher percentage of outside directors in the board, the less the optimistically biased forecast should be expected. Moreover, the results of Huang et al. [2012] show that the increase in the level of insider and institutional shareholder increases the probability of more conservative earnings forecast. However, although the above mentioned studies emphasize the importance of corporate governance attributes in explaining the earnings forecasts accuracy, one should notice that they refer to already publicly traded companies, which are associated with a lower level of information asymmetry when compared to those seeking to be listed.

There is very little research to examine corporate governance mechanism with the earnings forecasts quality issued by going public companies, and the obtained results suffer usually from a limited number of companies including forecasts in the IPO prospectus. For French IPOs, Mnif [2009] shows that managers are likely to prepare more accurate and more pessimistic earnings forecasts if the board size is small and the participation of independent directors on the board is greater. In case of Malaysian new stock companies, Ahmad-Zaluki and Wan-Hussin [2010] report that the profit projections are more accurate as the proportion of independent directors in the audit committees grows and the larger audit committee size results in more precise forecasts. Furthermore, Ammer and Ahmad-Zaluki [2014, 2017] examined whether earnings forecasts in the IPO prospectus are affected by ethnic background and gender of the board and the audit committee. Their results provide arguments supporting the diversity policy. The significance of the corporate governance structure for the quality of earnings forecasts is also documented by Yang and Kao [2007] for Taiwanese companies. However, Bédard et al. [2008] contrariwise report that the presence and characteristics of an audit committee are not significant in explaining the forecasts accuracy published by Canadian IPO companies. Although the issue of the corporate governance system in Poland has received attention of many researchers [e.g., Urbanek, 2005; Aluchna, 2007; Ježak, 2010; Gad, 2011; Adamska, 2013; Postuła, 2013; Bohdanowicz, 2016; Dobija and Kravchenko, 2017], the studies on the relationship between corporate governance attributes and earnings forecasts quality of IPO companies have not been conducted.

Since the two-tier board structure is not as frequent throughout the world as the one-tier one, most of prior literature deals with companies acting under the one-tier board model [Ježak and Bohdanowicz, 2016, p. 10]. According to the existing regulations, Polish companies establish a two-tier board structure consisting of the management and the supervisory board¹. Generally, under the two-tier model, the board of directors is responsible for day-to-day operations and strategy development, while the supervisory board fulfills supervisory and approving functions [Bohdanowicz, 2015, p. 1421; Gad, 2015]. Bearing in mind that our study takes a sample of Polish companies, one should be aware of the fact that the results of existing studies may be applied in our research to a limited extend.

The board size is one of the corporate governance attributes that draws attention of many researchers and is commonly used in a great deal of studies in this field [e.g., Cheng, 2008; Daghani et al., 2016]. The literature emphasizes that a greater board size may lead to problems with communication, coordination, and decision-making process as conclusions reached after consideration of large groups require more compromises resulting in less extreme decisions than those made by smaller groups [Jensen, 1993; Eisenberg

¹ In European countries, both one-tier and two-tier board models are adopted. Moreover, in some countries, regulations allow shareholders to choose a board model [Bohdanowicz, 2014]. Under a one-tier board model, there is one body – board of directors performing both managerial and supervisory functions. The board of directors consists of inside and outside directors in the US or executive and non-executive directors in the UK. A two-tier model is called a German corporate structure and is adopted not only in some European countries but also provides the basis for corporate governance structure in some Asian countries, e.g. Japan, Taiwan, and Indonesia. A one-tier model is commonly called as an Anglo-American or Anglo-Saxon board structure [Lin, 2010].

et al., 1998, p. 37; Cheng, 2008, p. 157]. However, some researchers maintain that a larger board can be more effective than a smaller one due to greater availability of expertise and resources [Hidalgo et al., 2011, p. 486]. Only a few studies analyze the association between the board size and accuracy of earnings forecasts issued in the prospectus. The findings of Bédard et al. [2008] for Canadian IPOs and Ahmad-Zaluki and Wan-Hussin [2010] for Malaysian IPOs show that the board size is not associated with accuracy of earnings forecast. Notwithstanding, the results of Yang and Kao [2007] for Taiwanese IPO companies show that a larger board is likely to publish more accurate earnings forecasts. Yet, contrary to these results, Mnif [2009] documented for French IPOs that a large board of directors is prone to disclose a less accurate and more optimistic earnings forecast.

While the existing research on the association between the board size and accuracy of earnings forecast is inconclusive and refers to countries under different legal regimes of corporate governance than those established in Poland, we give privilege to the resource dependency theory. In our opinion, a greater board size may have positive effect on the quality of earnings projections, as a larger board provides a broader view on different aspects of the firm's activity. Thus, we posit the following hypotheses:

H1A. The size of management board is positively associated with accuracy of earnings forecast.

H1B. The size of supervisory board is positively associated with accuracy of earnings forecast.

One of the most frequently examined areas concerning corporate governance is also the issue of board diversity [e.g., Bohdanowicz, 2011c]. Board diversity may refer to observable and less visible attributes of board members. The observable category includes attributes such as gender, age, and ethnical background, whereas less visible characteristics are “educational, functional and occupational backgrounds, industry experience, and organizational membership” [Kang et al., 2007, p. 195].

The arguments for board diversity are usually derived from the agency theory and the resource dependency theory [Hillman and Dalziel, 2003]. In accordance with the agency theory, the board represents and protects the interests of shareholders [Kang et al., 2007, p. 195]. As far as shareholders are not a homogenous group, to fulfill these functions properly, it is expected from the board to be a heterogeneous group as well [Diepen, 2015, p. 2]. The resource dependency theory argues that a diversified board has greater access to valuable resources, such as “capital, customers, suppliers, or cooperative partners” [Randøy et al., 2006, p. 5]. In accordance with this theory, the board is not only a provider of valuable networks of ties between company and its stakeholders, but members of the board are perceived as individuals possessing unique skills, knowledge, competences, and other features [Hillman and Dalziel, 2003]. Diversity may provide the firm with a better insight and thus increase the quality of made decisions. To sum up, the rationale for diversity is as follows: innovation and creative problem-solving, acquiring talent and employee relationships, understanding the business marketplace, access to resources and networks, and enhancing reputation [Mishra and Jhunjhunwala, 2013, pp. 5–7].

The policy of diversity is promoted in many countries by adopting adequate regulations applied to the board composition, and it is also often present in codes of best practices voluntarily adopted by public companies. For example, in order to increase women's presence on boards, some EU countries introduced gender quotas on a voluntary or mandatory basis [Campbell and Bohdanowicz, 2015]. In Poland, *Best Practice of GPW Listed Companies 2016* introduces the rules on the composition of the management and supervisory boards, and these bodies are expected to be comprehensive and diverse, among others, in terms of gender, education, age, and professional experience of the members [Best Practice of GPW Listed Companies 2016, p. 7]. It is worth noting that the rule on women diversity on boards came into force much earlier, in 2010 and 2012 [Best Practise for Listed Companies, 2013].

In our study, we examined two aspects of the diversity policy referring to board composition. More specifically, we addressed the question whether a more diverse management and supervisory boards in terms of gender and age are likely to issue more accurate forecasts.

The literature on gender diversity in the boardroom provides many theoretical arguments explaining the unique role of women. For example, female directors have different priorities and leadership styles

than their male counterparts [Al-Shaer and Zaman, 2016, p. 212]. Their leadership styles are defined as interactive [Bohdanowicz, 2011a, p. 182], which may lead to better communication and thus facilitate solving problems. Women are considered to be stakeholder oriented and likely to realize risk-reducing projects or to take socially responsible actions [Al-Shaer and Zaman, 2016, p. 212]. What is more, compared to men, female executives are perceived as being less overconfident [Huang and Kisgen, 2013]. These psychological factors are the basis of numerous studies analyzing the impact of female board members on many areas of the company's activities, such as performance [Carter et al., 2003; Bohdanowicz, 2011c; Pletzer et al., 2015; Bennouri et al., 2018], earnings management [Arun et al., 2015; Huang et al., 2012], reporting quality [Al-Shaer and Zaman, 2016], willingness to voluntarily disclose information [Ahmed et al., 2017], and risks undertaken by the company [Huang and Kisgen, 2013].

In the context of earnings forecasts accuracy of companies seeking to be listed, some important proposals are provided by the study of Ammer and Ahmad-Zaluki [2017], who hypothesize that gender diversity in audit committees in Malaysian companies is positively correlated with management earnings forecasts accuracy. Contrary to the expectations, their findings show that the presence of women in the audit committee has a negative impact on the quality of earnings forecasts. Nevertheless, they point out that it cannot be an argument against the gender diversity policy but rather for an increasing number of female members in the boards. While the proportion of women in the audit committee is relatively small, their influence on the quality of disclosed financial information is very limited. We expect positive effects resulting from the presence of women on the boards. Thus, our hypotheses state as follows:

H2A. Participation of females in the management board is positively associated with earnings forecast accuracy.

H2B. Participation of females in the supervisory board is positively associated with earnings forecast accuracy.

The age diversity of the board is another characteristic used as a proxy of board diversity, but it has not been as extensively studied as the issue of gender diversity. Theoretically, the board age diversity brings to the company comprehensive resources and expertise [Talavera et al., 2018, p. 60]. While older directors are perceived to have more knowledge and experience and take a more holistic approach, younger directors are perceived as being more active and energetic, willing to take challenges, and use new technologies [Houle, 1990, p. 34; Mishra and Jhunjhunwala, 2013, pp. 75–76]. Notwithstanding, age diversity may lead to problems with communication and conflicts among members of the group [Talavera et al., 2018, p. 60].

To our best knowledge, studies on the association between board age diversity and earnings forecast accuracy have not been carried out yet. Thus, bearing in mind that the need for board diversity is promoted in many countries and also supported by theoretical considerations, we posit the hypotheses as follows:

H3A. Management board age diversity is positively associated with earnings forecast accuracy.

H3B. Supervisory board age diversity is positively associated with earnings forecast accuracy.

Another vital aspect in explaining the level of the accuracy of managers' profit projections may be the ownership structure of the company, more specifically, the proportion of shares owned by members of the board. Huang et al. [2012] assumed that managers are more likely to publish overoptimistic and less accurate earnings forecasts if the risk of being penalized for not achieving them is low. Thus, one would expect that as the managerial ownership increases, management earnings forecasts become less accurate and overestimated. The rationale behind this conclusion is the fact that while higher managerial ownership reduces agency conflicts by diminishing interest divergence of managers and shareholders, the risk of incurring a penalty decreases. However, this supposition is not in line with the reputation cost theory, arguing that managers tend to issue more accurate earnings forecasts in order to preserve their own and the company's reputation [Ibrahim and Ismail, 2015, p. 237]. The quality of earnings forecasts may be used as the indicator of managers' credibility and their competence [Karamanou and Vafeas, 2005, p. 461]. Therefore, one may assume that higher management ownership will be associated with more accurate profit forecasts.

Nevertheless, the findings of prior research contradict with the reputation cost theory. The results of the studies for publicly traded companies in the US [Karamanou and Vafeas, 2005] and Taiwan [Huang et al., 2012] give evidence that higher management ownership results in lower accuracy of earnings projections. In addition, similar results were obtained by Ibrahim and Ismail [2015] for companies seeking to be listed in Malesia.

We follow previous research that gives privilege to the argument that managers issue more accurate forecasts when the risk of being penalized for not achieving them is high. As the shareholdings of management increase, the risk of dismissal of a management board member decreases. It means that disclosing accurate forecasts may not be as an important factor in the process of supervising the manager's activity as in the case of a lower level of management ownership. Thus, managers are not motivated to issue more accurate forecasts, and we hypothesize as follow:

H4A. Management board ownership is negatively associated with the earnings forecast accuracy.

If the members of the supervisory board hold shares of the company, their performance lower than expected in financial projections affects their wealth and thus the assessment of their managerial skills and supervisory activity. In such circumstances, the supervisory board is more likely to make managers responsible for not meeting expectations. Moreover, a higher proportion of shares owned by the supervisory board facilitates the recalling of management board members. Given this, we state the following hypothesis:

H4B. Supervisory board ownership is positively associated with earnings forecast accuracy.

3 Methodology

Our initial sample contains all 356 IPOs listed on the Warsaw Stock Exchange for the period 2006–2016. We started our sample in 2006 because since the beginning of that year, all companies seeking to be listed on the main market of the Polish stock exchange have been obliged to apply in the process of IPO the provisions of the Act on Public Offering, Conditions Governing the Introduction of Financial Instruments to Organized Trading, and Public Companies dated July 29, 2005 [Ustawa], which implemented the relevant EU regulations into the Polish legal system and introduced uniform regulations regarding disclosure of financial forecasts in the prospectus.

First, we limit our sample to companies that offered to the stock investors the primary or secondary shares and have never been publicly traded before, i.e. their shares have not been previously listed on the exchange-regulated stock markets such as *NewConnect* and *MTS-CeTo*. Then, as customary in the literature, we exclude companies in banking and insurance because of their industry regulations as well as foreign companies to avoid the particular features of these firms possibly biasing our results [e.g., Sila et al., 2016; Matsa and Miller, 2013]. We found 217 IPOs matching these criteria. Of these, we identified 104 IPOs that disclose the profit forecast for the IPO year in the prospectus. Thus, our final sample consists of these companies.

We use the multivariate OLS regression to study the impact of various management and supervisory board characteristics on the accuracy and bias of the earnings forecast voluntarily disclosed in the IPO prospectus. In order to investigate such relationships and to test research hypotheses, our main model setup is specified as follows:

$$\text{Forecast accuracy}_i = \alpha + \sum_j \beta_j \text{board variables}_i^j + \gamma \text{control variables}_i + \varepsilon_i$$

where i goes from each analyzed company, β regression coefficients capture the potential impacts of j board characteristics on the quality of management earnings forecast, γ represents the parameter for other factors that may influence the forecast accuracy, and ε_i denotes the random error term in a regression equation.

Because of a two-tier board model in Poland, we estimate several regression models, separate for the management and the supervisory board [Bohdanowicz, 2015, p. 1423], in which the dependent variable being a mark of forecast accuracy takes a different form. Table 1 summarizes all the types of variables we used in our study.

Table 1. The variable definition

Variables	Measures	Predicted sign
Panel A: Dependent variables		
FER	Earnings forecast error	
AFER	Absolute earnings forecast error	
SUP	Superiority of forecasting earnings	
Panel B: Board characteristics variables		
BOARD_SIZE	Size of the management board (MB) (supervisory board [SB]) board, which is the total number of directors (supervisors) in the board of firm	MB: – SB: –
FEMALE	Ratio of the number of female directors (supervisors) to the total number of directors (supervisors) in the board of firm	MB: – SB: –
AGE_DIV	Age diversity of MB (SB) measure based on the modification of the Herfindahl index (HHI)	MB: – SB: –
OWNERSHIP	Total number of shares held by all directors (supervisors) to the total number of pre-initial public offering (IPO) outstanding shares	MB: + SB: –
Panel C: Control variables		
HORIZON*	The horizon of an earnings forecast is measured as the number of days from the release of the prospectus to the end of the IPO year	–
C_SIZE*	Size is measured by the total value of sales in the year prior to the IPO	+
AGE*	The difference between the IPO date and the date of incorporation in years	+

*In OLS regressions, we use a natural logarithm (ln) of this variable.

We use three different forecast error measures to investigate in details the accuracy of forward-looking information about earnings that is disclosed in the prospectuses of the analyzed companies.

First, we use FER that is the earnings forecast error as a proxy of earnings forecast bias. FER is the difference between the earnings realized in the IPO year and its predicted value as given in the prospectus scaled to the absolute value of the earnings forecasts. Its negative value indicates that the realized profit was lower than forecasted and the financial forecast was overoptimistic. In contrast, its positive value indicates that the earnings forecast disclosed in the prospectus is conservative and too pessimistic in comparison to the actual earnings.

Then, we use AFER, i.e. absolute earnings forecast error, as a proxy of the overall level of management earnings forecast accuracy. AFER is the equal absolute value of FER, and informs how much the actual profit differs from its forecast value, regardless of whether the error results from the over- or underestimation of the forecast.

Our third measure of profit forecast accuracy is SUP, i.e. superiority of forecasting earnings to capture the ability of management to predict earnings more accurately than a time series model used as a benchmark. Its positive value shows that managers are able to prepare a profit forecast better in comparison to prediction based on the random walk model. SUP is measured as follows:

$$SUP = \ln \left[\left(\frac{AE_t - AE_{t-1}}{AE_t - FE_t} \right)^2 \right]$$

where AE is earnings realized by the IPO firm, FE is the earnings forecast as given in the prospectus, and t and $t-1$ denote the IPO year and one year earlier, respectively.

All in all, the FER models allow us to investigate the relations between the firm's corporate governance attributes and earnings forecast bias, the AFER models allow us to examine the influence of some board characteristics on earnings forecast accuracy in general, and using of SUP allows us to assess the links between board system features and the ability of managers to prepare the accurate forward-looking financial information in the IPO prospectus.

In order to answer the question if the pre-IPO corporate governance practices could have an impact on the accuracy of earnings forecast voluntarily revealed in the prospectus, we use four explanatory variables as a proxy of board characteristics. BOARD_SIZE measures the number of persons in the management and the supervisory board. Next, we use FEMALE and AGE_DIV as the subject of interest in our analysis is the diversity of directors and supervisors sitting on the board. FEMALE reflects a fraction of female directors and supervisors in the board composition. We use AGE_DIV to capture diversity in age among the board members. As the age diversity index is based on the Herfindahl index, we follow Sitthipongpanich and Polsiri [2015, p. 124]; first, we classify age of directors and supervisors into five age cohorts (g), and then, we proceed as follows:

$$AGE_DIV_i = 1 - \left[\sum_{g=1}^n \left(\frac{AGE_g}{BOARD_SIZE} \right)^2 \right]$$

where AGE_g is the number of directors in each age cohort (g). So, if AGE_DIV takes low values, it means that there is a little age variety on the board, and conversely, a higher index shows higher diversity in terms of age among the board members [Solanas et al., 2012].

As we are also interested if the board ownership contributes to the reliability of managerial earnings forecast, we use the independent variable OWNERSHIP that measures the executive directors' and supervisors' aggregate shareholdings. All these board characteristics are measured as reported by the company in the IPO prospectus.

In our research approach, we consider three additional control variables as well. First, we use HORIZON to control for the interval between the earnings forecast and the realization of earnings. A long forecast horizon makes forecasting more difficult [Bédard et al., 2016, p. 249], as companies making long-term predictions might be subject to greater fluctuations in operations, thereby increasing the likelihood of an error [Chapple et al., 2005, p. 78]. Second, as Yau and Chun [1999], Jelic et al. [1998], Hartnett and Romcke [2000], and Karim et al. [2013] suggested, we also included variable C_SIZE. Larger issuers have incentives to show greater accuracy forecast in comparison to smaller peers because the possible cost of misleading forward-looking information would be higher for a larger IPOs than for a smaller one [Karim et al., 2013, p. 298]. The third control variable is AGE. According to prior empirical studies of Yau and Chun [1999] and Ibrahim and Ismail [2015], older and more mature IPO companies have been shown to have a greater forecasting precision. Firms with a longer operating history are typically considered to be more likely to have established trading histories and stable growth patterns, conducive to greater forecasting precision [Hartnett and Romcke, 2000, p. 108].

All the information regarding management and supervisory board characteristics, profit forecast, and the company's age has been hand collected from the issuers' prospectuses. Other information about the issuers, especially financial ones, including the real net earnings and revenues from sales, is obtained from the financial statements available in the *Notoria Service* database.

4 Empirical results

Table 2 provides some insight into the composition of the corporate governance bodies that have been established in companies seeking to be listed on the Warsaw Stock Exchange. Regarding the age of people responsible for the day-to-day management and those exercising control over the executives, one would notice that supervisory board is more diverse in terms of age than the management board. While most

of management board members are aged between 41 and 60 years, more than 50% of supervisory board members are younger than 41 years or older than 61 years. The Polish legal provisions regarding the size of the supervisory board require to appoint at least five board members in public companies, and such boards are the most common. The supervisory board consisting of more than five members is established only in about 18% companies. As far as the gender of board members is concerned, the presence of women in the boards is very low in our sample, but some differences between the composition of the management and the supervisory board may be observed. The management boards seem to be more homogenous in terms of gender than the supervisory boards. Up to 70% of the surveyed companies had management board consisting of men only, while the male supervisory boards were observed in 36.54% of the companies. Not surprisingly, although the percentage of companies with members of boards owing the company vary across our sample, both in the management and the supervisory board, the 5% minimum notification of managerial share ownership threshold is crossed in 72.12% and 60.58% of samples, respectively.

Table 2. Variation in corporate governance attributes among study sample (N=104)

Characteristics	Management board	Supervisory board (SB)
Age: Percentage of members who are:		
40 years old or less	0.3741	0.4040
41–50 years old	0.3810	0.2706
51–60 years old	0.2177	0.2249
61 years old or more	0.0272	0.1005
Board size: Percentage of firms with board consisting of:		
2 (SB: 5) people or less	0.4038	0.8269
3 (SB: 6) or 4 (SB: 7) people	0.5192	0.1538
5 (SB: 8) people or more	0.0769	0.0192
Female: Percentage of firms with number of women on board:		
No women	0.7019	0.3654
1 women	0.2885	0.4231
2 women	0.0096	0.1442
3 and more	0.0000	0.0673
Ownership: Percentage of firms with board ownership:		
Less than 5%	0.2788	0.3942
5%–33%	0.1538	0.1250
33%–75%	0.1923	0.1827
More than 75%	0.3750	0.2981

Source: Own calculations.

Table 3 provides summary statistics for variables applied in our regression models. We find that earnings forecasts issued in the IPO prospectus are not accurate and overoptimistic. The mean AFER reveals that on average, actual earnings differ from their projected value by 34.05%. Taking into account the median of AFER at 19.37% (i.e. more than 10%²), one would conclude that the reliability of disclosed earnings forecasts because of their accuracy is questionable and the earnings projections exceed their reported values by 16.21% on average. Interestingly, the results show that more than half of the studied companies disclosed too optimistic forecasts (median FER at –1.64%). However, the positive mean and median values of SUP show that such forward-looking information prepared by managers is more accurate in comparison to the profit prediction made on the basis of the random walk model.

² Until April 2018 Polish regulation required from public companies to issue voluntary forecasts to publish current reports if earnings forecasts turn out to be inaccurate, i.e. actual profit differs from its projected value more than 10% [Rozporządzenie Ministra Finansów z dnia 19 lutego 2009 r.].

Table 3. Summary statistics of all variables

Specification	Mean	Standard deviation	Median	Min	Q1	Q3	Max
Dependent variables							
FER	-0.1621	0.5952	-0.0164	-3.2360	-0.2910	0.0969	0.9510
AFER	0.3405	0.5135	0.1937	0.0011	0.0517	0.3904	3.2360
SUP	1.7636	3.7101	1.4153	-10.5907	-0.9369	4.0500	11.8018
Management board variables							
BOARD_SIZE	2.8269	1.0376	3.0000	1.0000	2.0000	3.0000	6.0000
FEMALE	0.1079	0.1876	0.0000	0.0000	0.0000	0.2250	1.0000
AGE_DIV	0.3392	0.2431	0.4444	0.0000	0.0000	0.5000	0.7200
OWNERSHIP	0.4904	0.4123	0.5009	0.0000	0.0258	0.9462	1.1491
Supervisory board variables							
BOARD_SIZE	5.2596	0.7758	5.0000	3.0000	5.0000	5.0000	10.0000
FEMALE	0.1784	0.1771	0.2000	0.0000	0.0000	0.2000	0.6667
AGE_DIV	0.5732	0.1251	0.5657	0.0000	0.4800	0.6400	0.8000
OWNERSHIP	0.3991	0.4073	0.2944	0.0000	0.0000	0.8675	1.1060
Control variables							
HORIZON	204	109	199	26	112	286	487
C_SIZE	186037	474543	65688	519	22827	139454	3946553
AGE	20.5577	25.4825	14	2	8	19.2500	149

Source: Own calculations.

Regarding board characteristics, the descriptive statistics reveal that on average, the management board size is approximately 3 (the average and median size is 2.82 and 3.00, respectively) and the supervisory board usually consists of five members, with the average and median value of the number of persons on the board at the time of the IPO of 5.26 and 5, respectively. The results for FEMALE variable confirm low female participation on boards as well. On average, the percentage of women in management boards is 10.79%. The female participation in the supervisory board is slightly higher and amounts to 17.84% on average, with a median value of 20.00%. Not surprisingly, with reference to the age diversity index, one should notice that members of the supervisory board are more varied in terms of age than members of the management board. This finding is expected as the supervisory board consists of bigger number of members. The mean value of OWNERSHIP allows to notice that on average, members of management board possess 49.04% of company's shares and 39.91% of shares is owned by supervisory members.

The results of the correlation matrix reporting pairwise correlation coefficients between the independent variables are presented in Table 4. Although there are significant correlations between some independent variables, we decided to include all variables in our models, as the observed correlations may be an obvious effect of company's development [Ujunwa et al., 2012, pp. 220–221].

We turn our attention to our central questions of whether the board system features could have an impact on the accuracy of the earnings forecast disclosed in the IPO prospectus. Table 5 shows the regression results of the links between the forecast accuracy and bias, corporate governance characteristics and the control variables.

Analyzing the results for the management board, we observe that two variables referring to management characteristics, i.e. AGE_DIV and OWNERSHIP, are significantly correlated with the AFER. The negative regression coefficient for age diversity is in line with our Hypothesis H3A. According to arguments provided by the resource dependency theory, a higher level of age diversity results in more accurate forecasts. Moreover, the positive and significant regression coefficient for AGE_DIV and FER shows that a management board composed of members of different age is likely to publish more conservative (i.e. pessimistic) earnings forecasts. Similarly, conversely to our expectations, increase in the management ownership has a significant and negative association with the forecast accuracy at the 10% level of statistical significance. As illustrated by Hypothesis H4A, we predicted that as the management ownership increases, the earnings forecasts accuracy decreases. As our findings provide different outcomes, it can be seen as indirect evidence that supports the reputation cost theory. In turn, the results for BOARD_SIZE

Table 4. Correlation matrix of explanatory variables

Specification	BOARD_SIZE	FEMALE	AGE_DIV	OWNERSHIP	HORIZON	C_SIZE
Panel A: Pearson correlation coefficient for management board						
BOARD_SIZE	1.0000					
FEMALE	0.0145	1.0000				
AGE_DIV	0.4083***	0.2281**	1.0000			
OWNERSHIP	-0.0315	0.0659	-0.0726	1.0000		
HORIZON	-0.0247	-0.0071	0.0247	-0.0153	1.0000	
C_SIZE	0.3454***	-0.3008***	0.1292	-0.0821	-0.0563	1.0000
AGE	0.0125	-0.0176	0.1049	-0.1489	0.0363	0.3606***
Panel B: Pearson correlation coefficient for supervisory board						
BOARD_SIZE	1.0000					
FEMALE	-0.1115	1.0000				
AGE_DIV	0.1435	-0.0008	1.0000			
OWNERSHIP	-0.1729	0.3364***	-0.0185	1.0000		
HORIZON	-0.0895	-0.0375	-0.0879	0.0146	1.0000	
C_SIZE	0.3129***	0.0360	0.3015***	0.0197	-0.0563	1.0000
AGE	-0.0473	0.2175**	0.1915*	0.1731*	0.0363	0.3606***

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

Source: Own calculations.

Table 5. Determinants of the earnings forecast error in the initial public offering (IPO) prospectus – OLS regression results

Specification	Management board			Supervisory board		
	FER	AFER	SUP	FER	AFER	SUP
Intercept	0.1265 (0.2126)	0.2014 (0.4105)	13.4316 (3.6868***)	-0.8619 (-1.3183)	0.5644 (1.0402)	6.7546 (1.7184)*
BOARD_SIZE	-0.1101 (-1.8064)*	0.0752 (1.4959)	0.0992 (0.2659)	0.0543 (0.7283)	0.0151 (0.2447)	0.7690 (1.7158)*
FEMALE	-0.4945 (-1.5630)	0.2607 (0.9994)	-1.9779 (-1.0212)	0.0299 (0.0922)	-0.1956 (-0.7276)	5.7761 (2.9663)***
AGE_DIV	0.4949 (1.9581)*	-0.3481 (-1.6707)*	2.4860 (1.6067)	1.3556 (3.0161)***	-1.0876 (-2.9160)***	3.0330 (1.1225)
OWNERSHIP	0.0173 (0.1303)	-0.2086 (-1.9068)*	-1.0044 (-1.2362)	-0.0055 (-0.0389)	-0.0341 (-0.2919)	-0.7528 (-0.8905)
HORIZON	-0.2355 (-3.0907)***	0.2556 (4.0688)***	-2.3265 (-4.9874)***	-0.2048 (-2.7136)***	0.2358 (3.7653)***	-2.1132 (-4.6571)***
C_SIZE	0.0800 (1.8690)*	-0.0928 (-2.6294)***	-0.0097 (-0.0371)	0.0410 (1.0200)	-0.0693 (-2.0765)**	-0.0341 (-0.1411)
AGE	0.0863 (1.1523)	-0.0651 (-1.0544)	-0.0238 (-0.0519)	0.0882 (1.1726)	-0.0299 (-0.4786)	-0.1156 (-0.2557)
Adj R ²	0.1572	0.2307	0.1871	0.1823	0.2435	0.2393
F-statistics	3.7451	5.4115	4.3878	4.2801	5.7357	5.6298
p-value for F-statistics	0.0013	0.0000	0.0003	0.0004	0.0000	0.0000
N	104	104	104	104	104	104

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

Source: Own calculations.

show negative and significant correlation only for one dependent variable – FER. The negative regression coefficient allows to expect that a larger management board is likely to prepare more optimistic earnings forecasts. However, none of our corporate governance variables describing the management board is significant in explaining SUP.

As far as the lack of statistical significance of our results for the gender diversity on the company's management board is concerned, one vital issue should be taken into account. It is worth noting, however, that this result does not necessarily indicate that a fraction of female directors in the board composition does not affect the accuracy of the projections of future earnings revealed in the IPO prospectus. It can also mean that the effect of women participation in the company's board is just too small to be detected [Asselain and Mould, 2010, p. 407; Bohdanowicz, 2011b, p. 84].

Referring to the results of the OLS regression analysis for supervisory board characteristics, one could see that a more heterogeneous supervisory board in terms of age results in more precise profit projections. These findings are in line with the Hypothesis H3B. Moreover, the disclosed forecasts are more pessimistic. Although signs for FEMALE and OWNERSHIP are similar to our expectations, again, these corporate governance variables lack statistical significance in explaining the accuracy of the profit forecast.

Nevertheless, some interesting outcomes provide the positive and significant coefficient for FEMALE and SUP. It means that the women's presence on the supervisory board may result in earnings forecasts better prepared by managers than those predicted on the basis of the random walk model. What is more, a higher proportion of women on supervisory board is negatively correlated with AFER, which may indicate the positive effect of female members on earnings forecasts accuracy as stated by Hypothesis H2B. However, this association is still not significant. For SUP, we also find a positive and significant coefficient of the interaction with the supervisory board size.

Regarding the controls, our results show that in most cases, dependent variables are affected by two control variables HORIZON and the company size (C_SIZE). Our findings are in line with previous studies reporting that earnings forecasts are more accurate if the forecasted horizon is shorter [Yau and Chun, 1999; Lonkani and Firth, 2005; Ibrahim and Ismail, 2015; Hasan et al., 2016] and the company size is larger [Jelic et al., 1998; Yau and Chun, 1999; Hartnett and Romcke, 2000; Abrokwa and Nkansah, 2014; Wawryszuk-Misztal, 2017].

5 Conclusions

Corporate governance attributes are a topic of increasing importance; nevertheless, there are some aspects regarding this research area that have not been surveyed. To contribute to this stream of study, we provide evidence on the role of supervisory and management board characteristics on earnings forecasts quality disclosed in prospectuses by IPO companies in Poland.

To summarize, our results imply that certain characteristics of the management and the supervisory board enhance the usefulness of forward-looking financial information from IPO prospectus, as some of board characteristics are important for the evaluation of earnings forecasts credibility at the time of IPO. First of all, in accordance with our expectations, the greater age diversity results in more accurate forecasts. This evidence may be an argument for establishing more heterogeneous boards in terms of age and, generally, for diversity policy among board members. Then, contrary to our expectations, we report that the higher management ownership results in more accurate forecasts. This finding may be useful for investors considering investment in shares offered to the public for the first time.

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