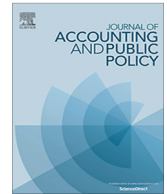




Contents lists available at ScienceDirect

J. Account. Public Policy

journal homepage: www.elsevier.com/locate/jaccpubpol

Full length article

Effective board monitoring over earnings reports and forecasts: Evidence from CFO outside director appointments

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ARTICLE INFO

Article history:

Available online xxxx

Keywords:

Chief Financial Officer (CFO)
Outside director appointment
Earnings restatement
Management forecast error

ABSTRACT

Prior evidence that firms adjust their board structure following accounting restatements suggests that firms expect the board to effectively monitor the firm's financial accounting system. However, little is known about signals firms use to identify monitoring weaknesses or the types of individuals firms appoint to improve the quality of monitoring. We expand on Ghannam, Bujega, Matolcsy, and Spiropolous (2019)'s evidence that firms appoint directors with accounting experience after financial fraud by investigating whether firms that file restatements or issue highly inaccurate earnings forecasts appoint individuals with CFO experience (i.e., a subset of accounting experts) to their audit committee. We find that firms are more likely to appoint an outside director with CFO experience to the audit committee when they have recently restated earnings and when they have higher prior management forecast error. We also find that the appointment of a CFO outside director to the audit committee is followed by a lower likelihood of restatement and more accurate management forecast. Together, our results suggest that firms respond to accounting failures by appointing outside directors with CFO experience. Thus, we provide insight into the signals firms use to identify weaknesses in the monitoring of the accounting function and the types of expertise firms value in addressing those weaknesses.

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1. Introduction

Firms regularly release earnings reports and forecasts that are used by the investing public and other outside stakeholders to evaluate management performance, assess investing risk, and project future cash flows. Given the importance on such public disclosures, understanding how a firm adjusts its governance system to monitor its accounting system and ensure that the firm issues reliable earnings reports and forecasts is a key public policy issue. Farber (2005) documents changes to board structure and practices following restatements, Arthaud-Day et al. (2006) document increased turnover for CFOs and CEOs following restatements, and Srinivasan (2005) documents similar increases in turnover for board members. While these papers show that firms consider the board to be an important monitor of the financial reporting function, there is limited evidence regarding how boards identify monitoring weaknesses or the type of individual boards consider important in addressing those weaknesses. Ghannam et al. (2019) provide evidence on this question by showing that firms appoint directors with an accounting background, legal background or board experience following the revelation of fraud. In this study, we expand on their findings by considering whether earnings restatements (in general) or inaccurate forecasts are indicators

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that monitoring of the financial reporting function needs improvement and whether firms tend to appoint an outside director with Chief Financial Officer (CFO) experience to the audit committee to address that weakness.¹ Our evidence provides additional insight into the way firms adjust their board structure to improve their monitoring effectiveness after issuing potentially misleading earnings reports or forecasts.

Fama and Jensen's (1983) theory suggests that boards will voluntarily select individuals with the skills and experience that enable them to best fulfill the advisory and monitoring board functions to maximize firm value. This theory suggests that firms would self-regulate their corporate governance system to provide the optimal degree of monitoring. However, the accounting scandals that led to the passage of Sarbanes-Oxley (SOX) indicated that in some cases the degree of monitoring over a firm's accounting system was inadequate from a public policy perspective. To address perceived weaknesses in board oversight over the accounting function, SOX mandated several changes to the composition of boards of directors, including adding a requirement that firms include a "financial expert" on their audit committee.² The enactment of SOX generated discussion regarding the need for regulators to intervene in the design of a firm's governance structure and the types of expertise that are most useful in overseeing the accounting function.

Specifically, the implementation of SOX raised questions as to how firms adjust their governance systems to improve monitoring over accounting systems. The issuance of misleading earnings reports and projections can lead outside investors and stakeholders to make incorrect inferences regarding the firm's performance and outlook. The response to signals of weaknesses in the firm's accounting system provides insight into the importance firms place on issuing misleading earnings information and the characteristics of board members that they believe to be most effective in improving the firm's accounting systems. To provide evidence on this issue, Ghannam et al. (2019) document that firms respond to the revelation of fraud by adding accounting and legal experts and experienced board members to their board.

In this paper, we expand on their study in two ways. First, rather than focusing solely on accounting fraud, we consider whether firms also adjust their board structure following a more comprehensive set of indicators of deficiencies in the monitoring of the firm's accounting system that includes a broader set of restatements (fraudulent restatements that represent intentional misapplication of GAAP and erroneous restatements that represent unintentional misapplication of GAAP) and issuing inaccurate forecasts of earnings. Legally, fraud implies that management intentionally deceived outside investors. While fraud is clearly under the purview of the audit committee, the audit committee is tasked with monitoring the quality of the outputs of the financial accounting system and we investigate whether firms respond to more general deficiencies in accounting system.

Because an audit committee's responsibilities include the oversight of the financial reporting process, related internal controls, and the independent auditor (Deloitte, 2018), errors in the firms' financial reports would indicate deficiencies in the audit committee's monitoring ability, regardless of whether such errors were intentional. Ineffective monitoring also results in inaccurate management forecasts because erroneous inputs from poor accounting system are used to form management guidance (Feng et al., 2009). Further, the New York Stock Exchange specifically requires the audit committee to oversee management guidance provided to analysts or credit rating agencies (NYSE Section 303A.07(c)).³ Therefore, we investigate whether boards consider the filing of an earnings restatement due to both fraud and unintentional errors and the issuance of inaccurate earnings forecasts as signals that the monitoring of the firm's accounting system needs improvement.⁴ By broadening the scope, our study provides additional insight into the signals boards use to identify weaknesses in the monitoring of their accounting systems.

Second, by focusing on CFO experience we provide new insights into whether boards consider an outside director's CFO experience as an indicator of their technical knowledge and expertise that enable them to effectively monitor the accounting function. While prior research has examined the role of accounting expert directors in general (e.g., Cohen et al., 2014; Ghannam et al., 2019), we narrow our focus to CFO directors because of the high demand for CFOs on boards (Ernst & Young, 2012a). Because the CFO position is generally the highest ranked individual expressly responsible for a firm's financial reports and disclosures, most CFOs have the expertise needed to oversee the accounting function, and a substantial literature documents evidence that a firm's CFO plays a critical role in determining the quality of the firm's financial reports and disclosures.⁵ Our study therefore provides insight into the demand and role of CFO outside directors and the differential impact of CFO outside directors on the monitoring of the firm's financial accounting function.

¹ We use the terms of "outside director with CFO experience" and "CFO outside director" interchangeably throughout the paper. Both terms refer to an outside director who has CFO experience.

² In addition to the SEC, the NYSE and NASDAQ also issued standards that require the presence of a financial expert on the audit committee of listed US companies.

³ Unlike NYSE, NASDAQ and other exchanges follow audit committee responsibilities set forth in Rule 10A-3(b) (2), (3), (4) and (5) under the Exchange Act and do not specify additional requirements such as overseeing management (for example, see NASDAQ Rule 5605(c)(3)). While the standards of other exchanges are not as robust as the NYSE rules, the NYSE requirements provide guidance to audit committees of all listed companies (Protiviti 2003). Further, Ajinkya, Bhojraj, and Sengupta (2005) note that, "[T]he National Investor Relations Institute (NIRI), 2002, in discussing issues related to earnings guidance and directors' role in evaluating the guidance, finds that although the Sarbanes-Oxley Act does not expressly require the board to review earnings releases, several prominent securities lawyers say they advise their clients to do so."

⁴ Although a management forecast of earnings is a forward-looking voluntary disclosure, the firm's accounting system provides the information used to derive a forecast, and therefore an inaccurate forecast may be viewed by the investing public as a failure of the accounting system to provide high-quality information.

⁵ Examples include Bamber et al. (2010), Bedard et al. (2014), Brochet et al. (2011), Chava and Purnanandam (2010), Cunningham et al. (2020), Ge et al. (2011), Geiger and North (2006), Hui and Matsunaga (2015), Jiang et al. (2010), Khan (2019), and Mian (2001).

Our first hypothesis considers whether the issuance of a restatement of earnings or a highly inaccurate forecast of earnings increases the likelihood that the firm will appoint an individual with CFO experience as an outside director on their audit committee. This provides evidence regarding whether firms appoint CFO outside directors to the audit committee to improve the monitoring over the accounting system to reduce the likelihood that they will issue misleading earnings reports and forecasts in the future. Our second hypothesis follows by investigating whether the appointment of an outside director with CFO experience to the audit committee reduces the likelihood that the firm will restate earnings or issue highly inaccurate earnings forecasts. This provides evidence regarding whether outside directors with CFO experience improve the monitoring over the accounting function.

To test our hypotheses, we use the BoardEx database to form a sample of outside audit committee appointments from 2004 to 2017 by publicly traded firms. In our first set of tests, we examine how a firm's recent restatement history and annual earnings forecast accuracy affect the likelihood that a firm will appoint an individual with CFO experience as an outside director to the audit committee. We find that an outside CFO director is more likely to be appointed to the audit committee following an earnings restatement or an inaccurate forecast. When we run similar tests for the appointment of accounting experts that do not have work experience as CFO, we do not find significant relations. Taken together, our findings suggest that firms consider the restatement of earnings and the issuance of inaccurate earnings forecasts to be signals of ineffective monitoring of the financial accounting function and the experience of serving in the CFO position to be a valuable indicator of the individual's ability to monitor the accounting function.

In our second set of tests, we investigate whether the appointment of an individual with CFO experience as an outside director reduces the likelihood that the firm will restate earnings in the future or reduces the firm's future management forecast error. We find evidence of a significant decline in both the likelihood of restatement and the magnitude of management forecast error following the appointment of a CFO outside director in both the full sample and subsamples of firms that either issued restated earnings or issued forecasts with a high degree of error. These results provide further support for the contention that outside directors with CFO experience serve as strong monitors over the firm's accounting system.

To provide additional insight into the incremental impact of CFO experience on monitoring quality, in a supplemental test we compare CFO outside directors with accounting backgrounds (i.e., accountant CFO directors) to CFO outside directors without accounting backgrounds (i.e., non-accountant CFO directors). Following [Bedard et al. \(2014\)](#) and [Hoitash et al. \(2016\)](#), we define accountant CFOs as individuals who serve as a CFO and either have a CPA license or have a record of holding an accounting position such as a controller, accounting officer, or accountant. We then compare the impact on the likelihood of a future restatement, or management forecast error, of appointing an accountant CFO director after restatement, or high forecast error, to the impact of appointing a non-accountant CFO director.

We find that while the appointment of both types of CFO outside directors are associated with a reduction in the likelihood of a future restatement, the appointment of an accountant CFO director has a significantly greater impact on the likelihood than an appointment of a non-accountant CFO director. With respect to future forecast error, we find that both types of CFO outside directors are associated with a significant decrease in forecast error in the restricted high forecast error sample, but do not find a significant effect for accountant CFO director in the full sample. We also find that the incremental impact of an accountant CFO director on future forecast error is not significantly different from the incremental impact of a non-accountant CFO director in both samples. These results suggest that outside directors with CFO experience improve the monitoring of the accounting function, but that having an accounting background further increases a CFO director's effectiveness in monitoring compliance with GAAP.

In another supplemental test, we investigate whether our results apply similarly to intentional (fraudulent) and unintentional (erroneous) restatements and find that both types of restatements are positively associated with the subsequent appointment of an individual with CFO experience as an outside director on the audit committee. Thus, it appears as though boards consider both types of errors as indicative of weaknesses in the monitoring of their financial accounting function.

Finally, we examine whether the impact of management forecast error on the subsequent appointment of a CFO outside director varies depending on whether the firm missed or beat the forecast. We find that both missing and beating the projected earnings by a large amount increase the likelihood that the firm will appoint an outside director with CFO experience on the audit committee. This suggests that inaccurate forecasts, in general, are indicators that monitoring of the financial reporting function needs improvement.

Our study contributes to the literature on how a firm adapts its corporate governance structure to address perceived deficiencies in its accounting system ([Farber, 2005](#)). While there is evidence that firms replace their CFO after accounting restatements ([Arthaud-Day et al., 2006](#); [Collins et al., 2009](#); and [Desai et al., 2006](#)), given that the CFO is a key part of the firm's executive team, replacing the CFO to improve reporting and disclosure quality could be an extreme and costly action. Our results complement and expand on the findings of [Ghannam et al. \(2019\)](#) by providing evidence that, beyond the extreme case of fraud, firms consider the issuance of an earnings restatement and inaccurate earnings forecasts as indications of weaknesses in the monitoring of the financial accounting function and that the appointment of an outside CFO director to the audit committee improves the monitoring of the accounting function, leading to a decrease in the likelihood of a future misstatement or a decrease in management forecast error.

Our study also contributes to the literature on the relation between board composition and the quality of monitoring over the firm's accounting system, in general, and the role of the CFO as a specific outside board member in monitoring a firm's accounting system. Specifically, we add evidence to the literature on the impact of board composition on the quality of a firm's financial reports and disclosures by identifying CFO experience as an indicator of the individual's ability to monitor

the accounting function.⁶ Although prior research broadly defines accounting experts (e.g., [Cohen et al., 2014](#); [Dhaliwal et al., 2010](#)), our study suggests that CFO experience has an incremental, positive influence over the outside director's effectiveness as a monitor of the accounting function.

Our evidence also adds to the literature on CFO's serving as board members. While prior studies have focused on the impact of CFO board experience on the accounting quality of the CFO's own firm, we focus on the CFO as an outside director. [Cunningham et al. \(2020\)](#) and [Khan \(2019\)](#) document evidence that serving as an outside director improves the accounting quality for the CFO's own firm, and [Bedard et al. \(2014\)](#) show that CFOs that serve as an inside director improves accounting quality for the CFO's own firm. In contrast, our study suggests that a CFO serving as an outside director improves the monitoring over the accounting system of the appointing firm. Our results therefore suggest that the appointment of a CFO outside director improves the audit committee's ability to effectively monitor the firm's accounting system.

Overall, our study has public policy implications regarding how firms respond to issuing misleading earnings reports and projections. While [Srinivasan \(2005\)](#) and [Arthaud-Day et al. \(2006\)](#) document evidence that director turnover is significantly higher following restatements, our study provides evidence that firms also adjust board structure following the issuance of potentially misleading earnings projections. Moreover, while [Farber \(2005\)](#) documents evidence that firms with deficiencies in financial reporting increase number of outside directors and number of audit committee meetings to improve their governance, he does not find evidence that firms increase the number of financial experts on the board. In contrast, our results extend the findings of [Ghannam et al. \(2019\)](#) who find that firms restructure boards after revealing fraud. Our evidence suggests that firms adjust their board following a broad set of accounting "failures", including general restatements and inaccurate earnings forecasts.

2. Hypothesis development

A key public policy question relates to how the corporate governance structure adapts to effectively monitor the firm's financial accounting function. Questions regarding the effectiveness of governance systems following multiple accounting scandals led Congress to pass the Sarbanes-Oxley Act that included a mandate that firms include a financial expert on their audit committee. Despite the increased regulation, differences in corporate governance structures continue to influence the quality of outputs from the firm's accounting system, such as earnings reports and forecasts.

For example, [Armstrong et al. \(2014\)](#) find that independent directors increase firm transparency. [Cohen et al. \(2014\)](#) find that greater industry and accounting expertise on an audit committee is associated with higher financial reporting quality. [Liu et al. \(2014\)](#) find that accounting expertise on an audit committee curbs expectation management to avoid negative earnings surprises. [Dhaliwal et al. \(2010\)](#) consider multiple director attributes and find that accruals quality is greater if audit committee accounting experts are independent, hold fewer directorships, and have lower tenure. [Ke et al. \(2020\)](#) find evidence of a positive relation between the number of directors from related industries on the board and the accuracy of a firm's management forecasts, and [Omer et al. \(2020\)](#) report that firms with well-connected audit committees are less likely to restate their financial reports. [Sengupta and Zhang \(2015\)](#) find a positive relation between the equity incentives of board members and disclosure quality. These papers provide evidence that board composition influences the extent of board oversight over the firm's accounting system.

The evidence that board composition influences a firm's accounting and disclosure quality raises questions regarding the specific adjustments firms make to their governance system to improve the monitoring of the accounting system after revealing accounting failures. While firms can discipline managers ex post by replacing individual managers ([Arthaud-Day et al., 2006](#); [Collins et al., 2009](#); [Desai et al., 2006](#); [Lee et al., 2012](#)), replacing key management is costly and disruptive. As an alternative, firms can adjust their board structure to improve the monitoring over the accounting function.⁷

[Ghannam et al. \(2019\)](#) provide evidence on this issue by documenting that following the revelation of fraud, firms are more likely to appoint individuals with an accounting or legal background or who have board experience. While their focus is on the compensation such individuals receive for the risk associated with serving on the board of a "fraud" firm, their study provides evidence as to how firms adjust their board structure following a lapse in monitoring. We extend [Ghannam et al. \(2019\)](#) by investigating a more comprehensive set of indicators of deficiencies in the monitoring of the firm's accounting system. Specifically, we consider earnings restatements in general, including both fraudulent restatements and erroneous restatements, and inaccurate earnings forecasts to be important indications of problems in the firm's financial accounting system.

As documented in prior research, weak monitoring can allow managers to intentionally misstate financial reports to meet their opportunistic goals (e.g., [Farber 2005](#)). Prior studies that have investigated changes to board structure have focused on fraudulent restatements ([Farber, 2005](#); [Ghannam et al., 2019](#)) because they are likely to represent more severe oversight failures and generate more negative market reactions and higher probability of class action lawsuits ([Hennes et al., 2008](#); [Palmrose et al., 2004](#)). However, we expect lax monitoring to allow unintentional misstatements to flow through undetected.

⁶ Examples include [Archambeault et al. \(2008\)](#), [Armstrong et al. \(2014\)](#), [Ashraf et al. \(2020\)](#), [Carcello et al. \(2011\)](#), [Cassell et al. \(2018\)](#), [Cohen et al. \(2014\)](#), [Dhaliwal et al. \(2010\)](#), [Eng and Mak \(2003\)](#), [Gul and Leung \(2004\)](#), [Karamanou and Vafas \(2005\)](#), [Ke et al. \(2020\)](#), [Liu et al. \(2014\)](#), [Omer et al. \(2020\)](#), and [Zhang et al. \(2007\)](#).

⁷ There is also evidence that accounting outcomes affect compensation structures. [Cheng and Farber \(2008\)](#) show that firms reduce their reliance on option compensation following restatements, and [Hui and Matsunaga \(2015\)](#) provide evidence that forecast accuracy influences CEO and CFO pay.

Therefore, the occurrence of a restatement could indicate that the audit committee was ineffective in monitoring firm's accounting system regardless of whether such misstatements are intentional or not. Further, restatements in general increase overall information uncertainty and decrease the credibility of the firms' financial statements (Graham et al., 2008), and the type of board structure adjustments following more general, and common, restatements is an open question.

Additionally, we examine changes in board structures following the issuance of inaccurate management forecasts. Section 303A.07(c) of New York Stock Exchange specifically requires the audit committee to review earnings guidance provided to analysts and rating agencies. For many outside investors, projected earnings are among the most important outputs of the firm's financial accounting system. Effective monitoring is likely to produce more accurate forecasts because inputs from the firm's accounting system are used to form management guidance (Feng et al., 2009). As a result, inaccurate earnings forecasts could indicate that the monitoring of the firm's accounting system needs improvement. Therefore, we investigate how firms adjust their governance structure following the issuance of inaccurate annual earnings forecasts.⁸

We focus on individuals who have experience serving in the Chief Financial Officer position because the CFO of a firm is generally the highest-ranking officer directly responsible for overseeing the firm's accounting system. When firms hire, or promote an individual to the CFO position, they can access private information to screen applicants and determine whether the individual has the requisite characteristics and knowledge to effectively carry out the responsibilities of the position. As a result, the appointment of an individual to be the CFO is a strong signal regarding the individual's competence. In addition, individuals serving in that role are likely to further develop expertise through their experience in working with subordinates within the firm and interacting with investors, analysts, and other stakeholders from outside the firm (Ernst & Young, 2012b).

There is considerable evidence that the specific individuals who serve as the firm's CFO play an important role in determining the quality of a firm's financial reports and disclosures. Geiger and North (2006) find changes in discretionary accruals following CFO turnover. Bamber et al. (2010) find evidence that individual officers are associated with differences in disclosure policies. Brochet et al. (2011) document evidence of changes in guidance policies following CFO turnover. Ge et al. (2011) present evidence that individual CFOs are associated with different types of accounting policies. Studies have also documented evidence that CFOs are held responsible for the quality of their firm's financial reports and disclosures. CFO turnover increases following financial misrepresentation (Arthaud-Day et al., 2006; Collins et al., 2009; Desai et al., 2006) and firms tie CFO compensation to the quality of the firm's disclosures (Hui and Matsunaga, 2015) and internal controls (Hoitash et al., 2012).

Taken together, these findings suggest that firms would consider appointing an individual with CFO experience as an outside director to address perceived weaknesses in financial reporting and disclosure. An outside CFO is likely to have the technical accounting expertise and experience interacting with the investment community needed to effectively monitor the accounting function. In addition, the evidence in Adams et al. (2018) that firm performance increases when directors have skill sets that overlap suggests that the common experience should allow the new CFO outside director to communicate effectively with the firm's CFO. This leads to our first set of hypotheses:

H1A: There is a positive relation between the filing of a restatement and the likelihood that an individual who has CFO experience will be appointed as an outside board member to the audit committee.

H1B: There is a positive relation between the absolute management forecast error and the likelihood that an individual who has CFO experience will be appointed as an outside board member to the audit committee.

The first set of hypotheses relate the appointment of a CFO as an outside director to the past quality of the appointing firm's earnings reports and forecasts. We next consider the implications of the appointment on the subsequent quality of appointing firm's earnings reports and forecasts. Specifically, we investigate whether an outside director with CFO experience provides additional monitoring that leads to a decline in the likelihood of restatement and an improvement in forecast accuracy.

Several studies examine how a CFO's representation on a board impacts the CFO's own firm. Bedard et al. (2014) find that firms that appoint their own CFO to the board tend to have higher financial reporting quality and conclude that more talented CFOs are more likely to be appointed to the board. Cunningham et al. (2020) and Khan (2019) find evidence that CFOs that serve as outside board members for other firms increase the reporting quality for their own firm and attribute it to their ability to learn from their network contacts. While these studies show that a CFO's representation on a board influences reporting quality of CFO's own firm, it is not clear whether appointing a CFO as an outside board member improves the reporting and disclosure quality for the appointing firm. To fill this void in the literature, we examine the impact of the board appointment of an outside director with CFO experience on the appointing firm's likelihood of filing a restatement and the magnitude of management forecast error.

⁸ Based on press releases and proxy statements surrounding director appointments, firms broadly refer to "accounting and/or financial expertise" at the aggregate level rather than any specific skills in discussing what make a director qualified to serve on their audit committee. In a similar vein, firms do not discuss an improvement in board monitoring as a motivation for the appointment. Instead, firms highlight the CFO experience of the new director who is appointed following the issuance of misleading earnings guidance. For example, NetApp Inc. states that the new CFO director's knowledge of financial matters complements the board's capabilities when it announces the appointment of the prior CFO of Tesla to the audit committee after being sued for issuing misleading guidance (NetApp Incorporation, 2020).

This leads to our second set of hypotheses:

H2A: The appointment of an outside director who has CFO experience to the audit committee after filing a restatement reduces the likelihood of subsequent misstatements.

H2B: The appointment of an outside director who has CFO experience to the audit committee after issuing highly inaccurate earnings forecasts reduces the absolute error of subsequent management forecasts.

3. Research design

3.1. Sample selection

Panel A of [Table 1](#) describes our sample selection process. Our sample includes firm years spanning from 2004 through 2017. We start our sample period in the year of 2004 to avoid inadvertently capturing the effects of the SOX implementation. Our sample period ends in 2017 because 2018 is the last year a full set of data are available, and we need at least one-year post appointment to evaluate the impact of the appointment on the appointing firm's financial reporting and disclosure quality. We use several databases to construct our sample. The director appointments and board composition data are obtained from BoardEx. We collect management earnings forecast from the Institutional Brokers' Estimate System (I/B/E/S) guidance database and restatement data from Audit Analytics. We further obtain accounting data from Compustat, stock returns information from the Center for Research in Security Prices (CRSP), and analyst forecast data from I/B/E/S. We drop firms in the financial and utility industries because their governance systems and the role of the CFO in their organizations are likely to differ from other firms. We also delete firm years reporting consecutive losses in the previous five years because financial information is less value-relevant for such firms and thus they have little incentive to focus on monitoring of their financial reporting ([Klein, 2002](#)). After eliminating observations for lack of data, we have a total of 28,066 firm years.

Panel B of [Table 1](#) provides the temporal distribution of CFO director and non-CFO accounting expert director appointments. Both types of director appointments appear to be relatively evenly distributed across years. In addition, except for 2004 for which we observe a relatively large ratio of CFO director appointments (16%), the overall proportion of CFO director appointments of 10% appears to be relatively stable over time.⁹ Thus, time clustering does not appear to be a major issue with the sample. The proportion of firm years appointing accounting expert directors other than CFOs is 3%, slightly less than one third of the CFO director appointments, consistent with anecdotes that there is significant demand for CFO directors due to SOX mandate ([Ernst & Young, 2012a](#)).

Panel C of [Table 1](#) presents the industry distribution of CFO director and non-CFO accounting expert director appointments based on the 2-digit SIC classification. Although the sample is dominated by manufacturing firms, we draw a substantial number of firms from each industry and the proportion of appointed directors who have CFO experience is generally constant across industries.¹⁰

3.2. Measurement of key variables

3.2.1. Chief financial officer

We use job titles as listed on BoardEx to identify CFOs. Because firms do not use consistent titles, we use the following procedure to identify the highest-ranking financial officer for the firm. First, we define three categories of keywords for the initial screening: (1) CFO, Chief Financial Officer, and Principal Financial Officer, (2) Vice President of Finance (and its variations like VP Finance, VP – Finance), (3) Vice President of Corporate Finance and its variations. If a firm has an executive with the job title in category (1), then that executive is classified as a CFO in our sample. If a firm doesn't have anyone with a title of category (1), then the executive with title in category (2) is counted as CFO in our sample. If the firm doesn't have any executive in either category (1) or (2), we classify an executive whose title comes from category (3) as a CFO.¹¹

3.3. Restatements

Although the filing of a restatement is a relatively rare event (occurring in approximately 7% of the sample firm years), it is a prominent and visible signal of poor reporting quality. Therefore, it could represent the type of accounting output that could cause firms to reassess the effectiveness of their governance system and add expertise to their board. Unlike [Ghannam et al. \(2019\)](#) who restrict their attention to accounting frauds, we include both fraudulent and erroneous restatements as indicators of monitoring deficiencies in firm's accounting system and use the Audit Analytics database to identify restatements.

⁹ As a sensitivity test, we run our main tests after dropping observations from year 2004 and find similar results.

¹⁰ As a sensitivity test, we run our main tests for manufacturing and non-manufacturing firms separately and find that our results are similar for both groups of firms.

¹¹ Approximately 98 percent of the CFOs in the full sample are identified by the first category of keywords.

Table 1
Sample Selection and Distribution Statistics.

Panel A: Sample Selection			Total Firm Years	
Intersection of BoardEx and Compustat from 2004 to 2017			63,226	
Less: Financial (2-digit SIC 60–69) and utility (2-digit SIC 49) industries			(16,395)	
Less: Missing BoardEx Data			(2,060)	
Less: Missing data from Compustat and CRSP			(3,242)	
Less: Missing data from IBES and Audit Analytics			(9,209)	
Less: Firm years reporting consecutive losses in the preceding five years			<u>(4,254)</u>	
Total firm-year observations			<u><u>28,066</u></u>	
Panel B: CFO Outside Director and Non-CFO Accounting Expert Director Appointments by Year				
Year	Firm Years Appointing CFO Outside Directors		Firm Years Appointing Non-CFO Accounting Expert Directors	
	N	%	N	%
2004	299	16%	114	6%
2005	238	11%	98	5%
2006	215	10%	92	4%
2007	233	11%	67	3%
2008	203	9%	57	3%
2009	171	8%	49	2%
2010	156	7%	40	2%
2011	171	9%	39	2%
2012	146	8%	41	2%
2013	163	8%	57	3%
2014	178	9%	49	3%
2015	219	11%	69	4%
2016	214	11%	52	3%
2017	171	10%	37	2%
Total	2,777	10%	861	3%
Panel C: Sample Distribution by SIC Industry				
SIC	Industry	Firm Years Appointing CFO Outside Directors	Firm Years Appointing Non-CFO Accounting Expert Directors	
01–09	Agriculture, forestry & fishing	6	3	
10–14	Mining	193	85	
15–17	Construction	40	19	
20–39	Manufacturing	1,426	387	
40–48	Transportation & communications	178	67	
50–51	Wholesale trade	108	38	
52–59	Retail trade	269	79	
70–88	Service industry	553	183	
	Other	4	3	
Total		2,777	861	

In this table, Panel A presents data on the derivation of the sample by firm-years. Panels B and C present the sample distribution by fiscal year and two-digit SIC industry, respectively.

3.4. Management forecast error

Management forecast error is a public, quantitative measure that reflects the accounting system's ability to generate information that is useful to forecast future earnings. Internally, firms care about forecast error because it reflects management's ability to use accounting system to generate useful information for investors and other outside stakeholders (Baik et al., 2011; Rogers and Van Buskirk, 2013). The high degree of importance boards of directors' place on issuing accurate forecasts is supported by evidence that boards tie CEO and CFO compensation to forecast accuracy (Hui and Matsunaga, 2015) and that management forecast error influences CEO turnover decisions (Lee et al., 2012).

To measure management forecast error, we use data from the I/B/E/S database to calculate the absolute difference between the forecasted value of annual earnings per share and actual earnings per share, scaled by stock price at the beginning of the fiscal year. We use point forecasts, if available, and the midpoint for range forecasts. We use the forecast of annual earnings rather than quarterly earnings because firms devote more accounting resources to determining key financial reporting estimates prior to the annual audit (Jeter and Shivakumar, 1999; Kross and Schroeder, 1990; Mendenhall and

Nichols, 1988; Salamon and Stober, 1994). In addition, because annual earnings are subject to a complete audit, using the reported annual EPS reduces the impact of managers using accounting discretion to improve the accuracy of their forecasts. In addition, annual earnings have a longer time horizon (median of 321 days). Therefore, they are likely to better reflect the quality of the firm's accounting system to produce accurate forward-looking information.

3.5. Empirical models

3.5.1. Model specifications for H1A and H1B

Hypothesis H1A predicts that the likelihood that a firm appoints an individual with CFO experience as an outside director is negatively related to the appointing firm's financial reporting quality. We test this hypothesis by estimating the following Probit model:

$$\text{Prob}(\text{CFODirectorAppointment})_{i,t+1} = \alpha_0 + \alpha_1 \text{RestatementFiling}_{i,t/t+1} + \sum \alpha_j \text{BoardStructureControls}_{i,t} + \sum \alpha_k \text{FirmControls}_{i,t} + \sum \text{IndustryFE} + \sum \text{YearFE} + \varepsilon_{i,t} \quad (1)$$

Appendix A contains descriptions of all variables used in our empirical tests. *CFO Director Appointment* equals one if an outside director with work experience as CFO for another firm is appointed to the audit committee in year $t + 1$, and zero otherwise. Our test variable, *Restatement Filing*, is set equal to one if the firm files restatement(s) in year t through year $t + 1$, and zero otherwise. We measure *Restatement Filing* over a two-year period to capture a possible delay between the board learning about the error and the filing of the restatement with the SEC. For example, assume that in 2010 the audit committee is informed that earnings are misstated, and the firm filed a restatement of earnings in 2011. Our measure allows the board to appoint an outside director with CFO experience to the audit committee in 2011 (a year after the error is discovered) or 2012 (a year after the restatement filing).¹² Panel A of Fig. 1 illustrates the timing of the variable measurement.

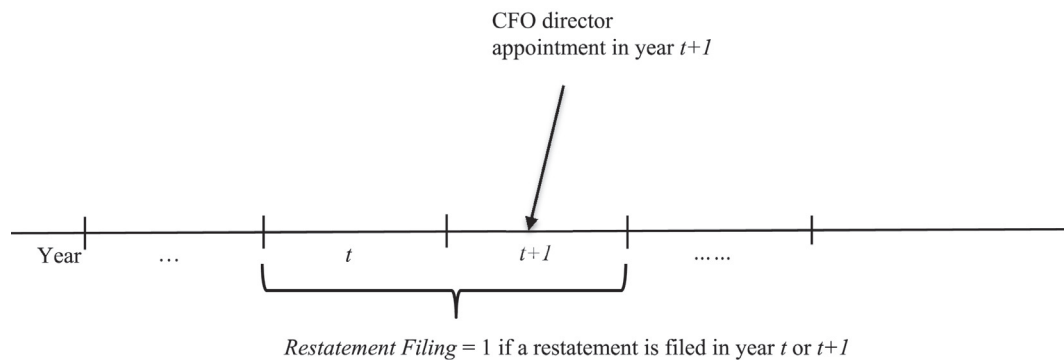
Although we expect the quality of management forecast to affect the appointment of an outside director with CFO experience, we exclude *Management Forecast Error* in this model to maximize the number of firm years in our sample because firms do not issue forecasts every year. Our first set of control variables includes measures that capture the existing board structure. The first is an indicator set equal to one if the firm currently has an outside director with CFO experience on the board (*CFO Director In-Place*). We expect firms to be more likely to appoint an individual with CFO experience to the board if one is not already present. Our next three variables reflect the dynamic nature of the board by measuring the number of CFO directors, inside directors, and outside directors respectively who left the board during one year prior to the event or the appointment year. We also control for governance quality with *Board Independence*, *Board Size*, and *CEO Chair Duality*. Because the CFO outside director is expected to fulfill a monitoring function, we expect the likelihood of a CFO director appointment to be increasing with strength of governance quality, although one could argue that weaker governance systems have a greater incentive to improve.

Our next set of control variables capture the value of the CFO's expertise in investing and financing decisions. As noted above, a CFO brings a varied skill set and broad expertise beyond financial reporting and disclosure that could influence the decision to appoint an individual with CFO experience as an outside director. To capture those incentives, our firm-specific controls include firm size, sales growth, capital expenditures, research and development spending, firm complexity, analyst forecast error, return on assets, and stock return. Finally, we include *Internal Control Material Weakness* because the disclosure of internal control material weakness is associated with subsequent changes in board structure including turnover of audit committee members (Johnstone et al., 2011). Our regressions also include fixed effects for industry and year, and we cluster standard errors by firm and year.

Hypothesis H1B predicts that the likelihood that a firm appoints an individual with CFO experience as an outside director on the audit committee is negatively related to the appointing firm's financial disclosure quality. We test this hypothesis by estimating the following Probit model:

$$\text{Prob}(\text{CFODirectorAppointment})_{i,t+1} = \alpha_0 + \alpha_1 \text{ManagementForecastError}_{i,t} + \alpha_2 \text{Horizon}_{i,t} + \alpha_3 \text{Specificity}_{i,t} + \alpha_4 \text{RestatementFiling}_{i,t/t+1} + \sum \alpha_j \text{BoardStructureControls}_{i,t} + \sum \alpha_k \text{FirmControls}_{i,t} + \sum \text{IndustryFE} + \sum \text{YearFE} + \varepsilon_{i,t} \quad (2)$$

¹² The restatement filing and director appointment could occur in the same year if accounting issues are raised by the SEC or employees. SEC comment letters that question a specific accounting treatment take several months to resolve (McKeon 2015). An employee tip could prompt an internal investigation that would precede the filing of a restatement. According to a survey, firms often prefer delaying announcing the identification of errors until the investigation is complete in the hopes that the misstatement may be immaterial, and a restatement is unnecessary (Chung and McCracken, 2014). For example, KBR Inc. filed a restatement in fiscal year 2014 that followed the receipt of a comment letter from the SEC in fiscal year 2013 (Coleman 2014). The SEC's comment letter and KBR's related responses were publicly available in early 2013. KBR appointed a former CFO of another company as an audit committee member in 2014, which is the same fiscal year in which it filed their restatement. As another example, Veritas Software Co. announced a restatement in fiscal year 2004, after an employee had raised concerns in fiscal year 2003 that were followed by the audit committee's investigation (Veritas Software Corporation 2004). In the same year of restatement filing, Veritas Software appointed Kurt Lauk, who had CFO experience, to the board.

Panel A: Variable Measurement in Testing H1A

This figure illustrates the timeline of variable measurements in testing Hypothesis 1A using director appointments.

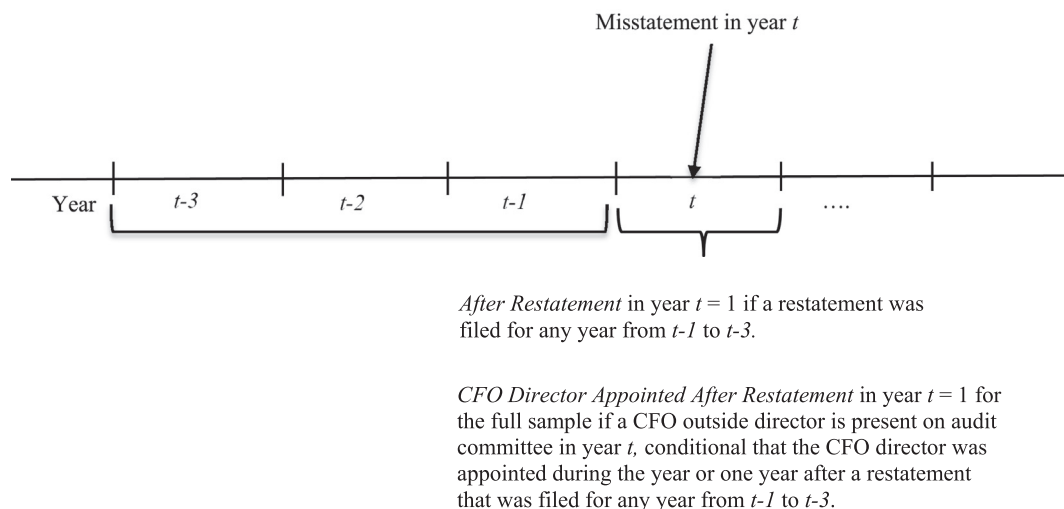
Panel B: Variable Measurement in Testing H2A

Fig. 1. The Timeline of Variable Measurement. Panel A: Variable Measurement in Testing H1A. This figure illustrates the timeline of variable measurements in testing Hypothesis 1A using director appointments. Panel B: Variable Measurement in Testing H2A. This figure illustrates the timeline of variable measurements in testing Hypothesis 2A using the full sample.

In this test, our variable of interest is *Management Forecast Error*, defined as the absolute value of the difference between actual and forecasted earnings per share scaled by share price at the beginning of the year. Because many firms do not provide guidance, our sample is limited to the firms that issued guidance during our sample period. Because the quality of the firm's accounting system is inversely related to the extent of the error in the forecast, H1B predicts α_1 to be positive, i.e., the greater the error in earnings forecast, the greater the likelihood that the firm will appoint an individual with CFO experience to serve as an outside director on the audit committee. In this test, we include *Restatement Filing* as a control variable. Including both test variables, i.e., *Management Forecast Error* and *Restatement Filing*, in the regression allows us to examine the incremental effect of each variable in the sample of firms that issued management forecasts. To control for other management forecast characteristics, we also include the horizon and specificity of the forecast. The remainder of our control variables are identical to the variables used in Eq. (1) to test H1A.

3.6. Model specifications for H2A and H2B

While H1A and H1B investigate the conditions leading to the appointment decision, H2A and H2B relate to the impact of the appointment decision on the firm's subsequent reporting and disclosure quality. To test these hypotheses, we use the following models that relate the existence of a misstatement resulting in future restatement or the management forecast error to CFO outside director appointments.

$$\begin{aligned} \text{Misstatement}_{i,t} = & \alpha_0 + \alpha_1 \text{AfterRestatement}_{i,t} + \alpha_2 \text{CFODirectorAppointedAfterRestatement}_{i,t} \\ & + \alpha_j \text{BoardStructureControls}_{i,t} + \alpha_k \text{FirmControls}_{i,t} + \Sigma \text{FirmFE} + \Sigma \text{yearFE} + \varepsilon_{i,t} \end{aligned} \quad (3)$$

In testing H2A, the dependent variable, *Misstatement*, is equal to one if the firm's financial statements in year t are identified as a future restatement by Audit Analytics, and zero otherwise. In this model, *After Restatement* equals to one for firm i in year t if the firm had previously filed a restatement for any year from $t-1$ to $t-3$, and zero otherwise. We include this variable because the probability of a misstatement of earnings for a given year is likely to depend on whether the firm has recently filed a restatement. The coefficient α_1 compares the changes in *Misstatement* among firms that have recently filed a restatement with the changes in *Misstatement* among firms that have not. The test variable, *CFO Director Appointed After Restatement*, is an indicator that equals one for firm years in which an outside director with CFO experience is present on firm i 's audit committee in year t , conditional that the CFO outside director was appointed during the year or one year after a restatement that was filed for any year from $t-1$ to $t-3$, and zero otherwise.¹³ The coefficient α_2 corresponds to the difference in differences estimator and captures incremental changes in *Misstatement* among firms that appoint a CFO outside director relative to firms that do not after having recently restated earnings. Panel B of Fig. 1 illustrates the timeline of variable measurement.

Additionally, we conduct our analysis on the restricted sample that consists of only firms that have previously filed a restatement by year t (Table 4A column (2)). As this sample enables us to control for the firm's prior history of a restatement, we do not include the *After Restatement* variable. In the restricted sample, the main variable of interest, *CFO Director Appointed After Restatement*, is an indicator that equals one for firm years in which the firm's audit committee in year t has an outside director with CFO experience who was appointed during the year or one year after filing a restatement. This variable is measured as one for the entire tenure of the CFO outside director as we do not assume a specific length of period during which a prior restatement or the presence of CFO outside director would affect the probability of misstatement. For both the full sample and the restricted sample, we adopt a linear probability model and include firm fixed effects to capture the within-firm incremental change in the probability of misstatement.

We include several board and firm-specific variables to control for other factors that could influence both the likelihood of misstatement and board appointments. We first include *Board Independence*, *Board Size*, and *CEO Chair Duality* to control for appointing firm's governance quality. We include these variables because board structure affects both the selection of directors and the likelihood of misstatement. Next, we include an indicator variable (*Incumbent CFO Turnover*) that is set equal to one if the appointing firm replaced its CFO during the year. The replacement of a CFO affects firm's financial reporting quality (Geiger and North, 2006; Ge et al., 2011) and may indicate that the firm is altering its governance structure. We include indicator variables that identify firms that have experienced high sales growth (*High Growth*), firms that have reported losses (*Trouble*), firms that engaged in merger and acquisition activity during the year (*Acquisition*), and firms that are audited by a big-4 firm (*Big4 Auditor*). Rapid growth is associated with fraud (Loebbecke et al., 1989) and may increase demand for changes in board composition (Beasley 1996). Firms under financial distress emphasize profitability, thereby increasing the likelihood of misstatement (Loebbecke et al., 1989) and the pressure to change corporate governance structure. The accounting complexity associated with merger and acquisition activity could increase the likelihood of restatements (Kinney et al., 2004) and changes in firm operations can lead to changes in board composition. Finally, clients of big 4 auditors tend to have higher financial reporting quality (Becker et al., 1998) and auditors are approved by the board.

We also control for firm size (*Size*), leverage (*Leverage*), and age (*Firm Age*). Larger firms are under greater regulatory scrutiny and have lower likelihood of misstatement (Dechow et al., 2011). Highly levered firms have greater incentive to manipulate earnings to avoid debt covenant violation (DeFond and Jiambalvo, 1994; Dichev and Skinner, 2002). Older firms tend to have less information asymmetry (Omer et al., 2020) and are less likely to change board composition as their board structure have already complied with regulatory requirements (Beasley, 1996).

We adopt the following model to test H2B:

$$\begin{aligned} \text{ManagementForecastError}_{i,t} = & \alpha_0 + \alpha_1 \text{AfterHighMFEError}_{i,t} + \alpha_2 \text{CFODirectorAppointedAfterHighMFEError}_{i,t} \\ & + \alpha_3 \text{Horizon}_{i,t} + \alpha_4 \text{Specificity}_{i,t} + \alpha_j \text{BoardStructureControls}_{i,t} + \alpha_k \text{FirmControls}_{i,t} \\ & + \Sigma \text{FirmFE} + \Sigma \text{yearFE} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

¹³ If a CFO director had tenure longer than 3 years, we drop years 4 and later from sample to measure the effect of a CFO director over the same length of period over which *After Restatement* is measured. We relax this assumption in using the restricted sample in which we do not control for *After Restatement* variable.

The dependent variable, *Management Forecast Error*, is equal to the absolute value of the difference between actual earnings per share for the year and the forecast of annual earnings per share scaled by stock price at the beginning of the year. The variable of interest, *CFO Director Appointed After High MF*, is an indicator that equals one for firm years in which an outside director with CFO experience is present on the firm's audit committee in year t , conditional that the appointment of the CFO outside director was made in the following year after issuing highly inaccurate management forecasts for years $t-1$ to $t-3$, and zero otherwise. We consider management forecasts to be highly inaccurate if the magnitude of forecast errors falls in the top quintile of all sample firms in each year. The coefficient α_2 captures the incremental change in the magnitude of management forecast error for firms that appoint a CFO outside director relative to firms that do not appoint after recently having issued highly inaccurate earnings forecasts. The variable *After High MF Error* is defined as one for firm i in year t if the firm issued management forecasts with large errors for any year from $t-1$ to $t-3$, and zero otherwise. We include this variable to control for the possibility that the magnitude of forecast errors is associated with the quality of recent forecasts.

We use ordinary least squares and include firm fixed effects to capture the within-firm incremental variation in management forecast error. We control for *Horizon* since prior research documents that forecast is more likely to be inaccurate as horizon gets longer (Baginski and Hassell, 1997) and *Specificity* because a point forecast is more likely to be inaccurate (Highhouse, 1994). Our next set of control variables include governance variables such as *Board Independence*, *Board Size*, and *CEO Chair Duality*. Prior studies suggest that effective board provides more accurate forecast (Ajinkya et al., 2005; Karamanou and Vafeas, 2005). We also control for *Incumbent CFO Turnover* because the replacement of a CFO may affect the quality of management earnings forecasts (Bamber et al., 2010; Brochet et al., 2011). Additionally, we control for a battery of firm-specific characteristics. We control for *Litigation* because Skinner (1994) suggests that managers are likely to provide conservatively biased forecasts when litigation risk is greater. *Industry Competition* is a proxy for firm's proprietary costs because prior research indicates that managers may issue pessimistic forecasts to prevent competition (Rogers and Stocken, 2005). Following Lee et al. (2012) and Sengupta and Zhang (2015), we also include *ROA*, *Return*, and *Loss* to control for firm performance. Finally, we include *Analyst Forecast Error*, *Size*, and *Market to Book* to control for the firm's information environment (Lang and Lundholm, 1996; Lee et al., 2012).

4. Empirical results

4.1. Descriptive statistics for director appointments

Table 2 provides descriptive statistics for the sample of CFO outside director appointments and control firm-years. We first compare firm years that are followed by the appointment of an outside director with CFO experience next year (Columns (1) and (2)) to all other firm years that are not followed by the CFO outside director appointment (Columns (3) and (4)). The comparison shows that the mean probability of restatement filing is 8.2% prior to appointing a CFO outside director, which is significantly higher at 10% level than the 6.9% for the control firm years. We also find that the mean absolute management forecast error for firm years prior to appointing a CFO outside director (1.7% of share price) is higher than the mean for firm years that are not followed by the appointment of a CFO outside director (1.5%), although the difference is not statistically significant. With respect to the control variables, the most notable difference is that firms appointing an individual with CFO experience as an outside director tend to be larger than firms not appointing CFO outside directors.

We next compare firm years that are followed by the appointment of an outside director with CFO experience (Columns (1) and (2)) to those that are followed by the appointment of an accounting expert director without CFO experience (Columns (5) and (6)). Appendix B shows the classification of each director type used in our analysis. Consistent with prior literature (e.g., Dhaliwal et al., 2010), we consider an audit committee member as an accounting expert if the individual has a CPA license or has worked as a CFO, vice-president of finance, accountant, controller, or in other accounting related position. The comparison of two samples shows that the probability of filing a restatement is higher for firms appointing a CFO outside director than for firms appointing an accounting expert director without CFO experience, although these differences are generally not statistically significant. We also note that firms appointing CFO outside directors tend to be larger than firms appointing non-CFO accounting expert directors.

4.2. Determinants of CFO outside director appointment: tests of H1A and H1B

Panel A of Table 3 presents the results of our test of H1A. In column (1), we present the results for the effect of a restatement on the appointment decision of an outside director with CFO experience. We find a significantly positive coefficient for *Restatement Filing* (0.083, $p < 0.01$), which suggests that filing a restatement leads firms to appoint an individual with CFO experience to their audit committee. To assess the economic significance of these results, we hold other covariates at their means, and find that, for firms that filed a restatement in the prior year, the probability of appointing a CFO outside director increases by 0.013, which is 13.35% higher than the sample mean probability.

To assess whether our results apply to the appointment of accounting expert directors, in general, as opposed to those with CFO experience, we conduct a similar test for appointments of accounting expert directors that do not have CFO experience. The results indicate that the coefficient on *Restatement Filing* is not significant for the appointment of an accounting

Table 2

Descriptive statistics on firm characteristics.

	Firm Years Appointing CFO Outside Directors N = 2,777		Control Firm Years N = 25,289		Firm Years Appointing Non-CFO Accounting Expert Directors N = 861	
	(1) Mean	(2) Median	(3) Mean	(4) Median	(5) Mean	(6) Median
Restatement Filing	0.082	0.000	0.069*	0.000**	0.072	0.000**
Management Forecast Error	0.017	0.006	0.015	0.005	0.018	0.007
Horizon	298.879	324.000	299.040*	322.000	298.761	321.000
Specificity	0.099	0.000	0.118	0.000	0.142*	0.000**
Board Independence	0.628	0.636	0.627	0.636	0.634	0.667
Board Size	9.204	9.000	8.897***	9.000***	9.184	9.000
CEO Chair Duality	0.458	0.000	0.474	0.000	0.488	0.000
Internal Control Weakness	0.075	0.000	0.070	0.000	0.060	0.000
Size	4,929.841	1,075.887	4,165.159***	823.763***	4,665.340	847.684**
Sales Growth	10.044	6.667	12.272	7.571***	13.617*	7.646
Capital Expenditure	0.051	0.033	0.053	0.033	0.056*	0.033
R&D	0.038	0.004	0.036	0.000***	0.027***	0.000***
Complexity	0.114	0.000	0.091	0.000	0.098	0.000
Analyst Forecast Error	0.023	0.008	0.023	0.008	0.025	0.008*
ROA	1.659	0.273	1.869*	0.282	1.723	0.280
Return	-0.009	-0.040	0.022**	-0.016***	-0.006	-0.046
Incumbent CFO Turnover	0.185	0.000	0.128***	0.000***	0.170	0.000
High Growth	0.190	0.000	0.203	0.000	0.207	0.000
Trouble	0.241	0.000	0.210***	0.000***	0.227	0.000
Acquisition	0.458	0.000	0.459	0.000	0.441	0.000
Big4 Auditor	0.870	1.000	0.833***	1.000***	0.848	1.000
Leverage	0.219	0.194	0.211*	0.178***	0.221	0.196
Firm Age	23.427	18.000	22.469**	17.000	22.778	17.000
Litigation	0.272	0.000	0.270	0.000	0.239	0.000*
Industry Competition	0.072	0.045	0.071	0.045	0.072	0.047
Loss	0.249	0.000	0.208***	0.000***	0.235	0.000
Market to Book	3.061	2.327	3.013	2.208	2.790	2.142*

The table shows means and medians of variables measuring firm characteristics. Columns 1 and 2 are 2,777 CFO director appointments. Columns 3 and 4 are for 25,289 control firm years. Columns 5 and 6 are for 861 appointments of non-CFO accounting expert directors. We conduct two-sample t-tests (Wilcoxon-Mann-Whitney tests) to test whether means (medians) of firm-years prior to CFO director appointments are significantly different from the control firm years and firm-years prior to the non-CFO accounting expert director appointments. All variables are defined in Appendix A. Statistical significance at the 1%, 5%, and 10% level is presented as ***, **, and * respectively.

expert director without CFO experience (Table 3A, Column (2)).¹⁴ We also find the coefficient on *Restatement Filing* to be significantly positive at the one percent level for the appointment of all accounting expert directors (Table 3A, Column (3)). Thus, our results suggest that the addition of “accounting experts” to the audit committee following a restatement may be largely driven by the appointments of outside directors who have CFO experience. Overall, our results suggest that firms that filed a restatement are more likely to appoint an individual with CFO experience as an outside director to the audit committee and support the prediction in H1A that firms experiencing low financial reporting quality are more likely to appoint a CFO outside director.

Panel B of Table 3 presents the results of our tests of H1B. The requirement that a firm issues a forecast of annual earnings lowers our sample size to 10,601 firm years (column (1)). To facilitate comparisons between samples, we repeat Eq. (1) to test whether H1A still holds for the reduced sample and find similar results (untabulated).

To test H1B, we include an additional test variable, *Management Forecast Error* and we find the coefficient on *Management Forecast Error* (1.526, $p < 0.01$) to be significantly positive at the one percent level. To estimate the economic magnitude, we measure marginal effects at the mean. Increasing management forecast error by one standard deviation increases the probability of appointing a CFO outside director by 0.009, which is 8% higher than the sample mean probability of appointing a CFO outside director. These results suggest that the greater the magnitude of the firm's forecast error, the greater the likelihood that a firm will appoint an outside director with CFO experience to the audit committee and support H1B's prediction that firms with lower financial disclosure quality are more likely to appoint an individual with CFO experience as an outside director. The coefficient for the restatement filing variable is positive and significant at the one percent level in this test, which indicates that the restatement filing remains significant, even after controlling for management forecast error.

¹⁴ The number of observations in Column (2) is smaller than that in Column (1) because there are no firm years appointing non-CFO accounting expert director in industries of tobacco products and textiles (i.e., no variation in the dependent variable in these industries) and thus 154 observations from these industries are omitted from the analysis. The number of observations in column (2) of Table 3B is smaller for the same reason.

Table 3

Determinants of CFO Outside Director Appointments.

Panel A. Appointing Firms' Restatement Filings and CFO Outside Director Appointments			
	(1) CFO Outside Director Appointment	(2) Non-CFO Accounting Expert Director Appointment	(3) All Accounting Expert Director Appointment
Restatement Filing	0.083*** (0.009)	0.045 (0.276)	0.079*** (0.009)
CFO Director In-Place	0.038 (0.127)	−0.207*** (0.000)	−0.051* (0.076)
Num of CFO Directors Who Left	0.414*** (0.000)	0.233*** (0.000)	0.434*** (0.000)
Num of Inside Directors Who Left	0.089*** (0.000)	0.080*** (0.001)	0.100*** (0.000)
Num of Outside Directors Who Left	0.203*** (0.000)	0.167*** (0.000)	0.219*** (0.000)
Board Independence	0.087 (0.423)	−0.090 (0.484)	0.027 (0.713)
Board Size	−0.526*** (0.000)	−0.264*** (0.000)	−0.505*** (0.000)
CEO Chair Duality	−0.052*** (0.000)	0.002 (0.930)	−0.041*** (0.007)
Size	0.062*** (0.000)	0.014 (0.210)	0.056*** (0.000)
Sales Growth	−0.001** (0.041)	0.001* (0.062)	−0.000 (0.323)
Capital Expenditure	−0.008 (0.967)	0.024 (0.944)	0.013 (0.951)
R&D	0.341 (0.132)	−0.850** (0.014)	0.095 (0.629)
Complexity	−0.009 (0.639)	0.021* (0.084)	0.006 (0.766)
Analyst Forecast Error	−0.227 (0.162)	−0.010 (0.953)	−0.151 (0.249)
ROA	−0.005*** (0.000)	−0.005** (0.021)	−0.005*** (0.000)
Return	−0.009 (0.681)	−0.016 (0.455)	−0.010 (0.595)
Internal Control Material Weakness	0.010 (0.787)	−0.121*** (0.002)	−0.026 (0.497)
Constant	−0.597*** (0.001)	−1.188*** (0.000)	−0.354** (0.018)
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	28,066	27,912	28,066
Pseudo R ²	0.0616	0.0567	0.0657
Panel B. Appointing Firms' Management Forecast Error and CFO Outside Director Appointments			
	(1) CFO Outside Director Appointment	(2) Non-CFO Accounting Expert Director Appointment	(3) All Accounting Expert Director Appointment
Management Forecast Error	1.526*** (0.004)	−0.108 (0.884)	1.151** (0.022)
Horizon	−0.054 (0.253)	0.094 (0.168)	−0.028 (0.535)
Specificity	−0.120** (0.020)	0.050 (0.632)	−0.077 (0.272)
Restatement Filing	0.134*** (0.008)	0.030 (0.702)	0.114** (0.012)
CFO Director In-Place	0.062 (0.317)	−0.239*** (0.001)	−0.037 (0.550)
Num of CFO Directors Who Left	0.402*** (0.000)	0.236*** (0.000)	0.421*** (0.000)
Num of Inside Directors Who Left	0.095*** (0.000)	0.101*** (0.006)	0.110*** (0.000)
Num of Outside Directors Who Left	0.191*** (0.000)	0.123*** (0.000)	0.196*** (0.000)
Board Independence	0.198 (0.183)	−0.088 (0.568)	0.104 (0.480)

(continued on next page)

Table 3 (continued)

Panel B. Appointing Firms' Management Forecast Error and CFO Outside Director Appointments			
	(1) CFO Outside Director Appointment	(2) Non-CFO Accounting Expert Director Appointment	(3) All Accounting Expert Director Appointment
Board Size	−0.521*** (0.000)	−0.287*** (0.002)	−0.507*** (0.000)
CEO Chair Duality	−0.104*** (0.000)	0.014 (0.778)	−0.078** (0.026)
Size	0.057*** (0.001)	0.009 (0.579)	0.050*** (0.001)
Sales Growth	−0.001 (0.463)	0.001 (0.114)	0.000 (0.954)
Capital Expenditure	0.215 (0.461)	−0.124 (0.844)	0.160 (0.582)
R&D	0.675* (0.093)	−0.852 (0.275)	0.216 (0.532)
Complexity	0.016 (0.670)	0.079* (0.099)	0.051 (0.252)
Analyst Forecast Error	−2.124** (0.033)	0.653 (0.387)	−1.271 (0.179)
ROA	−0.004 (0.102)	−0.004 (0.104)	−0.005** (0.016)
Return	−0.037 (0.194)	−0.035 (0.490)	−0.032 (0.149)
Internal Control Material Weakness	0.068 (0.226)	−0.064 (0.511)	0.054 (0.317)
Constant	−0.382 (0.106)	−1.608*** (0.002)	−0.220 (0.384)
Industry Fixed Effects	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes
Observations	10,601	10,518	10,601
Pseudo R ²	0.0558	0.0541	0.0563

The table presents results from a Probit regression of the determinants of director appointments from 2004 to 2017. All variables are defined in Appendix A. Standard errors are clustered by firm and year, and the *p*-values are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

The table presents results from a Probit regression of the determinants of director appointments from 2004 to 2017. All variables are defined in Appendix A. Standard errors are clustered by firm and year, and the *p*-values are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

We also examine whether low disclosure quality also increases the probability of appointing other accounting expert directors who do not have CFO experience. The coefficient on *Management Forecast Error* is not significant for the appointment of an accounting expert director without CFO experience (Table 3B, Column (2)), suggesting that the increased demand for better monitoring is not extended to other accounting experts beyond CFO outside directors. The significant coefficient for the appointment of all accounting experts including both CFO outside directors and other non-CFO accounting expert directors (Table 3B, Column (3)) suggests that the positive relation between management forecast error and accounting expert appointments may be driven by the appointment of outside directors with CFO experience.

We also find that firms are more likely to appoint an individual with CFO experience as an outside director when they lose existing CFO directors, other outside directors, or inside directors, suggesting that some firms tend to replace other directors with a CFO outside director rather than expanding the size of their boards.

4.3. Consequences of CFO outside director appointment: tests of H2A and H2B

H2A and H2B predict that the appointment of an individual with CFO experience as an outside director on the audit committee will be followed by a lower likelihood of a misstatement resulting in future restatement and a lower magnitude of management forecast error, respectively. To test H2A, we use a linear probability model that conditions the likelihood of misstatement on the presence of a CFO outside director appointed by firms that recently filed a restatement. The results are presented in Panel A of Table 4.

Column (1) reports the results for the full sample. We find that the coefficient on *After Restatement* is significantly negative (−0.098, *p* < 0.01), suggesting that firms are less likely to misstate their reports after having recently filed a restatement. We also find that the coefficient for *CFO Director Appointed After Restatement* is negative and significant (−0.095, *p* < 0.01). This supports H2A and is consistent with the assertion that appointing an outside director with CFO experience to the audit committee reduces the probability of a future restatement. On average, one standard-deviation increase in *CFO Director Appointed After Restatement* is associated with a decrease in the probability of misstatement by 37.9% of the

Table 4

Financial Reporting and Disclosure Quality Associated with CFO Outside Director Appointment.

Panel A. Likelihood of Misstatement		
	(1) Full Sample	(2) Firm Years after Restatement
After Restatement	−0.098*** (0.000)	
CFO Director Appointed After Restatement	−0.095*** (0.000)	−0.115*** (0.000)
Board Independence	−0.130*** (0.009)	−0.114 (0.119)
Board Size	−0.035* (0.060)	−0.029 (0.317)
CEO Chair Duality	0.016 (0.102)	0.006 (0.562)
Incumbent CFO Turnover	0.005 (0.330)	0.008 (0.357)
High Growth	0.003 (0.485)	0.002 (0.817)
Trouble	0.017 (0.133)	0.033* (0.064)
Acquisition	0.005 (0.239)	0.010 (0.249)
Big4 Auditor	0.002 (0.894)	−0.041 (0.147)
Size	0.007 (0.155)	0.005 (0.491)
Leverage	0.067** (0.026)	0.090** (0.045)
Firm Age	−0.038 (0.119)	−0.104** (0.017)
Constant	0.334*** (0.003)	0.572*** (0.002)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	27,649	12,706
Adj. R ²	0.2396	0.228
Panel B. Management Forecast Error		
	(1) Full Sample	(2) Firm Years After High MF Error
After High MF Error	−0.001 (0.215)	
CFO Director Appointed After High MF Error	−0.003* (0.057)	−0.006*** (0.003)
Horizon	0.007*** (0.000)	0.011*** (0.001)
Specificity	−0.000 (0.643)	−0.000 (0.831)
Board Independence	0.003 (0.237)	−0.001 (0.905)
Board Size	0.000 (0.751)	0.001 (0.721)
CEO Chair Duality	0.000 (0.597)	0.001 (0.310)
Incumbent CFO Turnover	0.002** (0.018)	0.004** (0.019)
Litigation	0.003 (0.114)	0.002 (0.604)
Industry Competition	−0.005 (0.508)	−0.012 (0.364)
ROA	0.000 (0.505)	0.000 (0.501)
Return	0.000 (0.905)	0.001 (0.734)
Loss	0.016*** (0.000)	0.020*** (0.000)

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Table 4 (continued)

Panel B. Management Forecast Error		
	(1) Full Sample	(2) Firm Years After High MF Error
Analyst Forecast Error	0.433** (0.010)	0.368** (0.024)
Size	−0.003*** (0.006)	−0.007*** (0.008)
Market to Book	−0.000 (0.226)	−0.000 (0.427)
Constant	−0.012* (0.084)	−0.001 (0.945)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	10,616	4,274
Adj. R ²	0.6806	0.6837

This table reports regression results of appointing firm disclosure quality associated with CFO director appointments. All variables are defined in [Appendix A](#). Standard errors are clustered by firm and year, and the *p*-values are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. The table reports a linear regression with the dependent variable equal to one if the appointing firm misstates earnings, resulting in future restatement. All variables are defined in [Appendix A](#). Standard errors are clustered by firm and year, and the *p*-values are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

mean probability of misstatement based on results presented in Column (1). As an alternative specification, we estimate our regression on a restricted sample that consists of only firms that have previously filed a restatement. While this substantially reduces our sample size, it should capture omitted variables associated with a restatement filing. We report the results in Column (2). Consistent with H2A, the coefficient for *CFO Director Appointed After Restatement* is significantly negative (−0.115, *p* < 0.01) in this specification. Overall, our evidence supports H2A's prediction that the appointment of an outside director with CFO experience improves financial reporting quality.

Panel B of [Table 4](#) presents the results for the test of H2B's prediction that the appointment of an outside director with CFO experience to the audit committee will be followed by lower management forecast error. We find the coefficients on *CFO Director Appointed After High MF Error* to be significantly negative in both the full sample (Column (1)) and the restricted sample of firm years that have previously issued highly inaccurate forecasts (Column (2)). This evidence supports the view that firms issue more accurate forecasts after appointing a CFO outside director to the audit committee. More specifically, one standard-deviation increase in *CFO Director Appointed After High MF Error* decreases management forecast error by 4.6% of the mean error based on results presented in Column (1). In addition, we find the coefficient for *After High MF* to be negative, but not significant at conventional levels. Thus, we do not find evidence of a significant relation between the prior issuance of highly inaccurate forecasts and the magnitude of future forecast errors.

5. Additional analysis

5.1. Accountant CFO director vs. non-accountant CFO director

In our prior tests, we treat all outside directors with CFO experience as homogeneous. In our next set of tests, we consider whether there is cross-sectional variation across these CFO directors by examining the effect of an accounting background for the CFO outside director on the relations documented above. [Bernard et al. \(2020\)](#) document a substantial variation in the depth of accounting expertise across CFOs. CFOs with strategic or operational expertise are likely to be weaker monitors of financial reporting, and vice versa ([Bernard et al., 2020](#)). Prior research indicates that CFOs with accounting backgrounds are associated with better financial reporting quality of their own firms ([Aier et al., 2005](#); [Li et al., 2010](#)). We therefore investigate whether a CFO outside director with an accounting background has a stronger impact on the appointing firm's likelihood of restatement, or management forecast error, after their appointment to the audit committee. [Appendix B](#) shows the classification of each director type used in our analysis.

Panel A of [Table 5](#) presents the results comparing accountant and non-accountant CFO directors' impact on financial reporting quality. Column (1) reports the results for all firm years and Column (2) reports the results for the subsample consisting of only firms that have previously filed a restatement. In both samples, while we find the coefficients on both *Accountant CFO Director Appointed After Restatement* and *Non-Accountant CFO Director Appointed After Restatement* to be significantly negative, an F test indicates that the appointment of an accountant CFO director has greater impact on the likelihood of misstatement than the appointment of a non-accountant CFO director.

Table 5

Additional Analysis: Accountant CFO Directors vs. Non-Accountant CFO Directors.

Panel A: Likelihood of Misstatement		
	(1) Full Sample	(2) Firm Years After Restatement
After Restatement	−0.098*** (0.000)	
Accountant CFO Director Appointed After Restatement	−0.126*** (0.000)	−0.147*** (0.000)
Non-Accountant CFO Director Appointed After Restatement	−0.059* (0.067)	−0.081** (0.012)
Board Independence	−0.130*** (0.009)	−0.117 (0.111)
Board Size	−0.034* (0.066)	−0.029 (0.318)
CEO Chair Duality	0.016 (0.108)	0.006 (0.591)
Incumbent CFO Turnover	0.005 (0.334)	0.007 (0.376)
High Growth	0.003 (0.490)	0.001 (0.838)
Trouble	0.017 (0.134)	0.032* (0.067)
Acquisition	0.006 (0.222)	0.010 (0.233)
Big4 Auditor	0.002 (0.911)	−0.042 (0.143)
Size	0.007 (0.154)	0.005 (0.505)
Leverage	0.066** (0.026)	0.088* (0.051)
Firm Age	−0.038 (0.116)	−0.105** (0.015)
Constant	0.334*** (0.003)	0.582*** (0.002)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	27,649	12,706
Adj. R ²	0.2399	0.2286
F-statistic	F(1,15) = 3.34*	F(1,15) = 3.97*
p-value	Prob > F = 0.0874	Prob > F = 0.0650
Panel B: Management Forecast Error		
	(1) Full Sample	(2) Firm Years After High MF Error
After High MF Error	−0.001 (0.219)	
Accountant CFO Director Appointed After High MF Error	−0.002 (0.321)	−0.005** (0.016)
Non-Accountant CFO Director Appointed After High MF Error	−0.005* (0.094)	−0.008** (0.019)
Horizon	0.007*** (0.000)	0.011*** (0.001)
Specificity	−0.000 (0.652)	−0.000 (0.839)
Board Independence	0.003 (0.230)	−0.001 (0.944)
Board Size	0.001 (0.743)	0.001 (0.722)
CEO Chair Duality	0.000 (0.599)	0.001 (0.315)
Incumbent CFO Turnover	0.002** (0.018)	0.004** (0.019)
Litigation	0.003 (0.115)	0.002 (0.608)
Industry Competition	−0.005 (0.507)	−0.012 (0.375)

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Table 5 (continued)

Panel B: Management Forecast Error		
	(1) Full Sample	(2) Firm Years After High MF Error
ROA	0.000 (0.483)	0.000 (0.479)
Return	0.000 (0.903)	0.001 (0.732)
Loss	0.016*** (0.000)	0.020*** (0.000)
Analyst Forecast Error	0.432** (0.010)	0.368** (0.024)
Size	−0.003*** (0.006)	−0.007*** (0.007)
Market to Book	−0.000 (0.228)	−0.000 (0.424)
Constant	−0.012* (0.080)	−0.002 (0.906)
Firm Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	10,616	4,274
Adj. R ²	0.6807	0.6837
F-statistic	F(1,15) = 0.56	F(1,15) = 0.84
p-value	Prob > F = 0.4645	Prob > F = 0.3727

This table reports regression results of appointing firm's disclosure quality. Accountant CFO is the CFO who has a CPA license or has worked as an accountant (internal or external), controller, or other accounting-related positions. Non-Accountant CFO is the CFO without such experiences. All other variables are defined in Appendix A. Standard errors are clustered by firm and year, and the p-values are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

The table reports a linear regression with the dependent variable equal to one if the appointing firm misstates earnings, resulting in future restatement. Accountant CFO is the CFO who has a CPA license or has worked as an accountant (internal or external), controller, or other accounting-related positions. Non-Accountant CFO is the CFO without such experiences. All other variables are defined in Appendix A. Standard errors are clustered by firm and year, and the p-values are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel B of Table 5 presents the results comparing accountant and non-accountant CFO directors' impact on financial disclosure quality. Column (1) reports the results for all firm years and Column (2) reports the results for the subsample consisting of only firms that have previously issued highly inaccurate management forecasts. We find the coefficients on both *Accountant CFO Director Appointed After High MF Error* and *Non-Accountant CFO Director Appointed After High MF Error* to be negative, while the coefficient for the accountant CFO director in the full sample is insignificant at the conventional level. An F test indicates that the impact of an accountant CFO director on subsequent forecast errors is not significantly different from that of a non-accountant CFO director. Overall, our results suggest that having an accounting background further increases a CFO outside director's effectiveness in monitoring the development of financial reports, but not the development of advanced forecasts of earnings.

5.2. Intentional vs. unintentional errors

In our main tests, we include restatements resulting from both intentional (fraudulent) and unintentional (erroneous) errors. Because prior studies focus on fraud, we examine whether the results hold for both types of restatements. Specifically, we estimate Eq. (1) separately for fraudulent restatements and erroneous restatements and report the results in Table 6.¹⁵ We classify restatements as fraudulent if restatements arise from irregularities and decrease earnings. Irregular restatements are identified if "RES_FRAUD" or "RES_SEC_INVEST" is 1 and if the text description includes "fraud, irregular, investigation, investigate, irregularity, irregularities, manipulation, manipulate" (Hennes et al. 2008). Income decreasing restatements that adversely affected the financial statements are identified if "RES_ADVERSE" is 1. All other restatements are counted as erroneous restatements or unintentional accounting errors. The coefficients for both *Fraudulent Restatement Filing* (0.153, $p < 0.10$) and *Erroneous Restatement Filing* (0.077, $p < 0.05$) are significantly positive, suggesting that filing a restatement regardless of the type increases the likelihood of appointing an outside director with CFO experience to the audit committee.

5.3. Missing or beating the management forecast

In our main tests, we use absolute management forecast error to measure the accuracy of the forecast. However, given the evidence that meeting or missing the management forecast influences CEO pay (Hui and Matsunaga 2015), we investigate

¹⁵ Table 6 reports slightly lower sample size relative to total number of observations in Table 1 because we drop firm years in which erroneous restatement is filed for testing the impact of fraudulent restatement and vice versa.

Table 6
Additional Analysis: Intentional vs. Unintentional Errors.

	CFO Outside Director Appointment	
	(1)	(2)
Fraudulent Restatement Filing	0.153* (0.075)	
Erroneous Restatement Filing		0.077** (0.024)
CFO Director In-Place	0.055** (0.040)	0.037 (0.152)
Num of CFO Directors Who Left	0.410*** (0.000)	0.416*** (0.000)
Num of Inside Directors Who Left	0.097*** (0.000)	0.090*** (0.000)
Num of Outside Directors Who Left	0.200*** (0.000)	0.202*** (0.000)
Board Independence	0.169 (0.145)	0.094 (0.385)
Board Size	−0.503*** (0.000)	−0.513*** (0.000)
CEO Chair Duality	−0.050*** (0.002)	−0.048*** (0.001)
Size	0.059*** (0.000)	0.061*** (0.000)
Sales Growth	−0.001* (0.068)	−0.001** (0.028)
Capital Expenditure	0.115 (0.628)	0.015 (0.935)
R&D	0.261 (0.233)	0.343 (0.137)
Complexity	−0.005 (0.810)	−0.010 (0.553)
Analyst Forecast Error	−0.162 (0.359)	−0.223 (0.163)
ROA	−0.004*** (0.004)	−0.005*** (0.000)
Return	0.000 (0.990)	−0.008 (0.713)
Internal Control Material Weakness	−0.017 (0.622)	−0.011 (0.793)
Constant	−0.699*** (0.000)	−0.637*** (0.001)
Industry Fixed Effects	Yes	Yes
Year Fixed Effects	Yes	Yes
Observations	24,648	27,602
	0.0606	
Pseudo R ²	0.0606	0.0616

The table presents results from a Probit regression of the determinants of director appointments from 2004 to 2017. *Fraudulent Restatement Filing* is an indicator variable that equals to one if the firm files restatements that arise from irregularities and decrease earnings. All other restatements are classified as erroneous restatements. All other variables are defined in Appendix A. Standard errors are clustered by firm and year, and the *p*-values are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

whether the impact of management forecast error on the appointment of a CFO outside director to the audit committee depends on whether the firm beat or missed their forecast. Specifically, we define indicator variable, *Large Miss Management Forecast* (*Large Beat Management Forecast*) as one if the reported earnings per share fell below (above) the forecasted earnings per share by a large amount (i.e., top quintile), and zero otherwise. We then replace *Management Forecast Error* with these two indicator variables in our regression model (Eq. (2)).

We report the results in Table 7. We find that both *Large Miss Management Forecast* and *Large Beat Management Forecast* indicators are significantly positive, and that the coefficient is larger if the firm missed the forecast albeit the difference is not significant (*p*-value = 0.183). This provides evidence that highly inaccurate forecasts, in general, are an indication of weaknesses in the firm's monitoring of the financial reporting system.

Table 7
Additional Analysis: Missing vs. Beating Management Forecasts.

	CFO Outside Director Appointment
Large Miss Management Forecast	0.143*** (0.004)
Large Beat Management Forecast	0.075* (0.087)
Horizon	−0.055 (0.251)
Specificity	−0.125** (0.015)
Restatement Filing	0.128** (0.013)
CFO Director In-Place	0.068 (0.257)
Num of CFO Directors Who Left	0.400*** (0.000)
Num of Inside Directors Who Left	0.092*** (0.000)
Num of Outside Directors Who Left	0.188*** (0.000)
Board Independence	0.198 (0.184)
Board Size	−0.511*** (0.000)
CEO Chair Duality	−0.102*** (0.000)
Size	0.062*** (0.000)
Sales Growth	−0.000 (0.529)
Capital Expenditure	0.150 (0.599)
R&D	0.727 (0.103)
Complexity	0.016 (0.674)
Analyst Forecast Error	−1.511* (0.052)
ROA	−0.005* (0.055)
Return	−0.034 (0.207)
Internal Control Weakness Filing	0.068 (0.237)
Constant	−0.378 (0.134)
Industry Fixed Effects	Yes
Year Fixed Effects	Yes
Observations	10,601
Pseudo R2	0.0535

The table presents results from a Probit regression of the determinants of director appointments from 2004 to 2017. *Large Miss Management Forecast* is an indicator variable that equals to one if the firm's actual earnings per share is lower than the first management forecast of earnings per share by a large amount (i.e., top quintile), and zero otherwise. *Large Beat Management Forecast* is an indicator variable that equals to one if the firm's actual earnings per share is higher than the first management forecast of earnings per share by a large amount (i.e., top quintile), and zero otherwise. All other variables are defined in [Appendix A](#). Standard errors are clustered by firm and year, and the *p*-values are reported in parentheses. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

6. Conclusion

A key public policy issue revolves around adjustments firms make to their governance structure following deficiencies in their financial reporting system that produced poor quality earnings reports and forecasts. Given the evidence that board turnover increases following earnings restatements and that boards appoint directors with accounting expertise following the revelation of fraud, it isn't clear the types of signals firms use to identify weaknesses in their financial reporting system and the types of experience boards consider to be most important in improving the firm's monitoring of the financial reporting function. In this paper, we provide insight into these issues by examining whether firms respond to earnings restate-

ments (both intentional and unintentional) and inaccurate forecast issuances by appointing an outside director with CFO experience to the audit committee and whether the appointment of such individual leads to a lower incidence of future restatements and improvements in forecast accuracy.

We find that firms that have recently filed a restatement or issued inaccurate management forecasts are more likely to appoint an outside director with CFO experience to their audit committee. This evidence is consistent with firms appointing an individual with CFO experience to their board to address perceived weaknesses in their accounting systems. We also find evidence that appointing an outside director with CFO experience to an audit committee is associated with a lower likelihood of a restatement filing and more accurate management forecasts in the future. We also find that having an accounting background further improves a CFO outside director's effectiveness regarding restatements, but not with management forecast error. Therefore, an accounting background appears to help more with monitoring compliance with GAAP than with projections of future earnings.

Overall, our evidence suggests that firms adjust their governance system following signs that they have released potentially misleading earnings numbers, and that they consider experience as a CFO to be an important characteristic for audit committee members to properly oversee the accounting function.

Declaration of Competing Interest

This study is supported by Korea University Business School Research Grant.

Acknowledgements

We thank the editor and two anonymous referees for their valuable guidance and feedback.

Appendix A. Variable definitions

Variable	Definition	Source
Dependent Variables:		
CFO Director Appointment	An indicator variable that equals one if an outside director with working experience as CFO is appointed to the audit committee in year $t + 1$, and zero otherwise.	BoardEx
Non-CFO Accounting Expert Director Appointment	An indicator variable that equals one if an accounting expert outside director who does not have work experience as CFO is appointed to the audit committee in year $t + 1$, and zero otherwise. A director is considered as non-CFO accounting expert if the individual has not worked as CFO but has a CPA license or has worked as an accountant (internal or external), controller, vice-president of finance, or other accounting-related position, and zero otherwise.	BoardEx
All Accounting Expert Director Appointment	An indicator variable that equals one if an accounting expert director is appointed to the audit committee in year $t + 1$, and zero otherwise. A director is considered as an accounting expert if the individual has a CPA license or has worked as CFO, an accountant (internal or external), controller, vice-president of finance, or other accounting-related position (Dhaliwal et al. 2010).	BoardEx
Misstatement	An indicator variable that equals one if the firm misreported its 10-Q or 10-K in year t and subsequently issued restatements, and zero otherwise.	Audit Analytics
Management Forecast Error	The absolute value of the management forecast error measured as actual earnings per share minus the first management forecast of earnings per share during the year, divided by the stock price at the beginning of the fiscal year.	I/B/E/S

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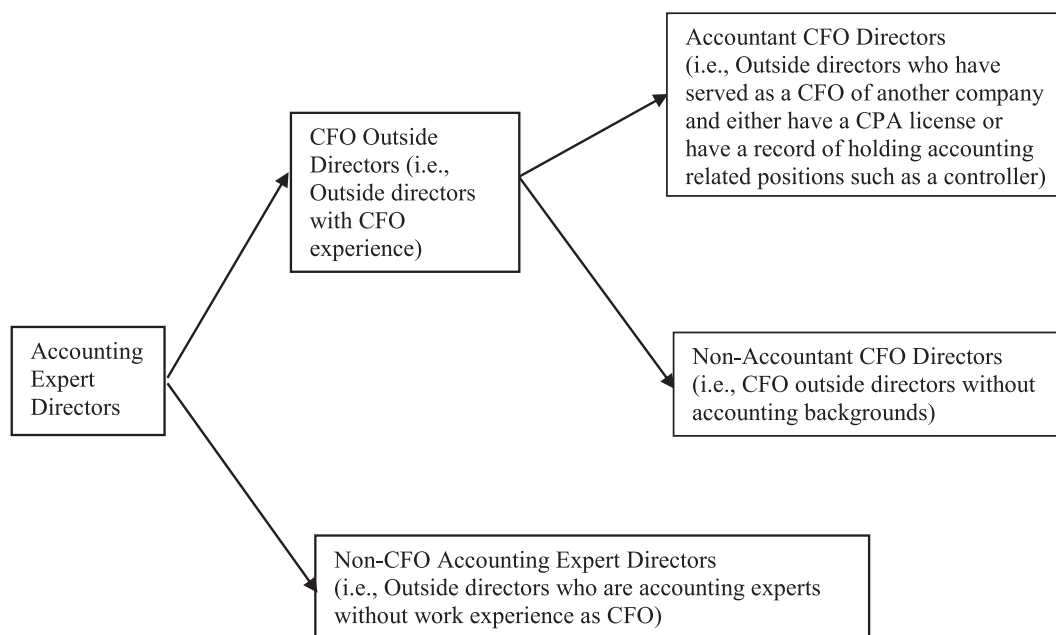
Appendix A (continued)

Variable	Definition	Source
Testing Variables (in addition to Management Forecast Error):		
Restatement Filing	An indicator variable that equals one if the firm files restatement in year t through year $t + 1$, and zero otherwise.	Audit Analytics
After Restatement	An indicator variable that equals one for firm i in year t if the firm have filed a restatement for any year from $t-1$ to $t-3$, and zero otherwise.	Audit Analytics
CFO Director Appointed After Restatement	Full sample: An indicator variable that equals one for firm-years in which an outside director with CFO experience is present on firm i 's audit committee in year t , conditional that the CFO director was appointed during the year or one year after a restatement that was filed for any year from $t-1$ to $t-3$, and zero otherwise. Restricted sample: An indicator that equals one for firm-years in which firm i 's audit committee in year t has a CFO outside director who was appointed during the year or one year after filing a restatement, and zero otherwise.	BoardEx
After High MF Error	An indicator variable that equals one if firm i in year t has issued management forecasts with large errors (top quintile) for any year from $t-1$ to $t-3$, and zero otherwise.	I/B/E/S
CFO Director Appointed After High MF Error	Full sample: An indicator variable that equals one for firm-years in which a CFO outside director is present on firm i 's audit committee in year t , conditional that the appointment of the CFO director was made one year after issuing highly inaccurate management forecasts (top quintile) for any year from $t-1$ to $t-3$, and zero otherwise. Restricted sample: An indicator variable that equals one for firm-years in which the firm's audit committee in year t has a CFO outside director who was appointed one year after filing a highly inaccurate management forecast, and zero otherwise.	BoardEx
Board Structure Variables:		
CFO Director In-Place	An indicator variable that equals one if the firm currently has a director with CFO experience on the board, and zero otherwise.	BoardEx
Num of CFO Directors Who Left	The number of CFO directors who left the board during year $t-1$ or t of the appointment year.	BoardEx
Num of Inside Directors Who Left	The number of inside directors who left the board during year $t-1$ or t of the appointment year.	BoardEx
Num of Outside Directors Who Left	The number of outside directors who left the board during year $t-1$ or t of the appointment year.	BoardEx
Board Independence	The percentage of outside directors on the board.	BoardEx
Board Size	Natural logarithm of the number of directors on the board	BoardEx
CEO Chair Duality	An indicator variable that equals one if the CEO is also chairman of the board, and zero otherwise.	BoardEx
Firm-Specific and Other Controls:		
Horizon	Natural logarithm of the number of days from the announcement date of firm i 's management earnings guidance for year t to the fiscal period end date for year t .	I/B/E/S
Specificity	An indicator variable equals one if the management earnings forecast is a point estimate, and zero otherwise.	I/B/E/S
Internal Control Material Weakness	An indicator variable that is equal to one if the firm discloses ineffective internal controls in year t , and zero otherwise.	Audit Analytics
Size	Natural logarithm of year-end total assets.	Compustat

Appendix A (continued)

Variable	Definition	Source
Sales Growth	Change in sales in year t , divided by sales in year $t-1$, multiplied by 100.	Compustat
Capital Expenditure	Capital expenditures scaled by total assets.	Compustat
R&D	Research and development expenditure scaled by total assets.	Compustat
Complexity	Standardized factor of the percentage foreign sale, number of business segments, and business and geographic segment sales concentration, where segment concentration is multiplied by negative one.	Compustat
ROA	Firm's ROA minus industry ROA. The firm's ROA is measured as earnings before interest and taxes deflated by beginning total assets. Industry ROA is measured as the mean ROA of firms in the same three-digit SIC code industry for the same period.	Compustat
Analyst Forecast Error	The absolute difference between the most recent consensus forecast of earnings per share prior to the release of earnings, scaled by the beginning of year stock price.	I/B/E/S
Return	Firm's annual buy-and-hold return adjusted by market return (value-weighted) and industry return. Industry return is measured as the mean return of firms in the same three-digit SIC code industry for the same period.	CRSP
Incumbent CFO Turnover	Indicator variable equal to 1 if the incumbent CFO of home firm leaves the firm and 0 otherwise.	BoardEx
Leverage	Sum of long-term debt and short-term debt scaled by assets.	Compustat
Acquisition	An indicator variable that equals one if the company engaged in a merger or acquisition during the year, and zero otherwise.	Compustat
Trouble	Number of years a firm has negative income over the last three years deflated by 3.	Compustat
High Growth	An indicator variable that equals one if the company's sales growth adjusted by industry median is in the top quartile and zero otherwise.	Compustat
Big4 Auditor	An indicator variable that equals one if the company is audited by a big 4 auditor, and zero otherwise.	Audit Analytics
Firm Age	Natural logarithm of number of years since firm first appears in Compustat.	Compustat
Litigation	Indicator variable equal to 1 if the company belongs to biotechnology (SIC codes 2833–2836), computers (SIC codes 3570–3577 and 7370), electronics (SIC codes 3600–3674), and retailing (SIC codes 5200–5961) industry.	Compustat
Industry Competition	Herfindahl Index calculated using all available firms for each of the two-digit SIC code industry as $\sum_i \frac{Sales_i^2}{IndustrySales_i^2}$, where i is the number of firms in the industry.	Compustat
Loss	An indicator variable that equals one if the firm has negative income, and zero otherwise.	Compustat
Market to Book	The ratio of market value of equity over book value of equity.	Compustat

Appendix B. The classification of director types



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