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The impact of board reforms on audit fees: International evidence

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Abstract

In this study, we investigate whether and to what extent country-level board reforms affect audit pricing decisions. We find audit fees are positively associated with board reforms. An increase in audit fees is more pronounced for firms that switched up to Big N auditors following board reforms. After board reforms, firms are less likely to issue restatements, and both analyst forecast accuracy and management forecast frequency increase, indicating improved audit quality and information transparency in the postreform period. Moreover, the positive relation between board reforms and audit fees is more evident for firms in countries that lack institutional governance mechanisms, captured by emerging capital markets, high political risk, weak governmental enforcement actions and low corporate governance quality. Overall, our findings broadly support the view that audit fees increase upon demand for better audit quality.

KEYWORDS
Analyst Forecast, Audit Committee, Audit Fee, Audit Quality, Big N Auditors, Board Independence, Board Reform, Corporate Governance, International Accounting, Restatement

JEL CLASSIFICATION
G3, M42, K20

1 | INTRODUCTION

To date, most empirical research on board and audit committee independence has not explicitly separated the gross costs and benefits of reforms, but rather, has focused on the net impact to financial reporting outcomes, firm value and capital markets in assessing the merits (Fauver et al., 2017; Cohen et al., 2014; Klein, 2002; Palmrose et al., 2004; Hribar & Jenkins, 2004; Becker et al., 1998; Dhaliwal et al., 2010; Griffin et al., 2008; Tsui et al., 2001; Abbott et al., 2003). This empirical stream has provided valuable, yet mixed, findings: the net effect of board independence and a separate audit committee varies significantly across firms, industries and countries (Fauver et al., 2017). Such variations call for a better understanding of the specific nature of costs and benefits to determine the economic trade-off of board reforms. To respond to such a call, this study is able to quantify the direct statutory audit costs incurred by firms by examining the adoption of board reforms.

We focus on audit costs because the adoption of board reforms is likely to have a profound impact on audit time and effort to review clients' financial statements. Therefore, audit fees represent a direct, observable and measurable cash outflow that may incorporate significant changes in the board structure and composition.[1] The impact of board reforms on audit fees is twofold. On the one hand, a more effective board with independent directors may demand higher audit quality (greater assurance), which requires more audit effort, to protect their reputation and to avoid future legal liability.[2] This is consistent with the theory that audit fee is an input-based audit quality measure and restatement is an output-based audit quality measure, according to DeFond and Zhang (2014). As a result, the demand for high audit quality may increase audit costs/fees by ensuring that auditors perform sufficient and appropriate audit procedures (Carcello et al., 2002; Abbott et al., 2003; Zhang & Yu, 2016) and thereby reducing the likelihood of future financial restatements, which supports quality demand hypothesis.[3]

On the other hand, the efficacy of board structure can influence audit quality if auditors consider a stronger board as an effective governance mechanism, among others. In addition, one may argue that audit effort and time significantly decrease after board reforms because internal and external governance mechanisms complement one another. Prior literature finds that an effective board may help reduce internal control risk and potential legal liability loss due to future potential lawsuits and, therefore, reduce the cost of auditing (Griffin et al., 2008; Tsui et al., 2001). This line of view is broadly consistent with the board complementary hypothesis. Given mixed predictions, our study aims at providing comprehensive international evidence on the role of enhanced governance quality in audit pricing decisions as well as audit quality by exploiting the latest regulatory board reforms across countries.

With 87,504 firm-year observations covering 31 countries for a sample period of 1990–2013, we find that audit fees dramatically increase after the implementation of board reforms by comparing audit fees around board reforms between firms in countries that undergo board reforms (the treatment group) and firms in countries without board reforms (the control group). More specifically, our results indicate that audit fees for domestic firms, on average, increase by at least 15.7% after reforms, which is an approximate estimate of $229,160. Next, to establish a causal

[1] In this study, we are particularly interested in these two board characteristics, since extant corporate governance literature shows that independent boards and audit committees significantly promote corporate governance quality (e.g., Klein, 2002). Independent (outside) directors, especially, process a substantial amount of firm-specific information to effectively perform their advising and monitoring duties. The audit committee is responsible for the appointment, compensation and oversight of the work of an external auditor as well as for reviewing financial reports. We separately tested the effect of CEO duality (the 3rd component of board reforms) on audit fees, but its effect on audit fees is at best marginal. Therefore, we provide the result in Appendices B and C. That is consistent with the findings of Fauver et al. (2017) that reforms involving board and audit committee independence increase firm value, but not reforms involving the separation of CEO and chairman positions.

[2] Knechel, Krishnan, Pevzer, Shefchik, and Velury (2013) note that the definition of audit quality could vary among stakeholders involved in generating financial statements.

[3] While we contend that the effect of enhanced corporate governance quality appears as increased audit fees through better audit quality, extant literature acknowledges the limitation of audit fees as a proxy of audit quality (e.g., Francis, 2004; Francis, 2011; Knechel et al., 2013; Hribar, Kravet, and Wilson, 2014; DeFond and Zhang, 2014; and Christensen, Glover, Omer, and Shelley, 2016). A common problem embedded within this line of research is there is no standardized observable measure to quantify audit quality. In this regard, the audit-fee variable has been used as one of the commonly used proxies for audit quality in accounting research. See DeFond and Zhang (2014) for a discussion that describes how audit fee is linked to audit quality. In their recent survey paper, Christensen et al. (2016) show that auditors' compensation must be sufficient to cover adequate audit effort that gathers sufficient audit evidence and justifies the opinion.

relation between board reforms and audit fees, we run dynamic regressions following Bertrand and Mullainathan (2003). Our results indicate that the effect of board reforms on audit fees lasts more than a year. Most importantly, we show that there is no significant difference in audit fees prior to the passage of board reforms between countries with board reforms and countries without, which confirms no reverse causality in our finding.

We further explore several aspects of external/internal corporate governance mechanisms. We first look into the likelihood that firms tend to switch from non-Big N to Big N auditors after board reforms. Our result suggests that firms are more likely to switch to high-quality audits (e.g., Big N) after board reforms. We further find that the positive relation between board reforms and audit fees is more pronounced for the firms that switch from non-Big N to Big N auditors, suggesting a possible channel through which firms take actions to meet the demand of high-quality audits from independent directors and audit committees.

Besides the influence on audit pricing, we further explore the impact of board reforms on audit quality and information transparency, captured by the likelihood of restatements, analyst forecast accuracy and management forecast frequency. We find that firms are less likely to restate their financial statements in the postreform period relative to the preperiod, especially for firms which switched to high-quality audits (e.g., Big N) after board reforms. We also document that analyst forecast accuracy and management forecast frequency increase significantly after reforms with Big N auditors. These results corroborate our main finding that boards demand high-quality audits, and as a result, audit quality and information transparency increase after reforms.

In addition to examining whether information quality may vary with institutional characteristics, we investigate whether the association between board reforms and audit fees is moderated by several country-specific characteristics—such as emerging versus developed capital markets, the strength of a country's legal regime and strong versus weak corporate governance quality—when auditors make pricing decisions. The theory of information acquisition costs (Kim et al., 2012; Duchin et al., 2010; Harris & Raviv, 2008; Raheja, 2005) argues that independent directors are better informed and have easy access to firm information (or lower costs of acquiring such information) in a rich information environment. Consistent with this prediction, we find that, *ceteris paribus*, auditors charge higher audit fees if board reforms occur in an emerging market and in countries with low corporate governance quality, weak governmental ability to implement policies and an unstable political environment.[4]

As a final set of tests, we conduct a variety of robustness tests, including (1) limiting the sample period to 2006 to avoid the perplex impact of the global 2008 financial crisis; (2) running the change analysis of audit fees, which provides results consistent with the main finding; (3) excluding US firms from the final sample to make sure that our main results are not driven by one single country and the SOX; (4) limiting our sample period to 1 year before and 1 year after [−1, +1] board reform years; and (5) excluding nonreform countries from the sample, to alleviate the concern of other concurrent events besides board reforms. In addition, we run the stacked regressions of audit fees following recent studies (Baker et al., 2022; Barrios 2021) to address a potential bias using a staggered difference in differences methodology. Overall, the additional results remain quantitatively and qualitatively the same as our main findings.

This study contributes to the literature on international auditing and corporate governance. First, this study utilizes country-level board reforms as an exogenous shock to individual firms to pinpoint a causal association between corporate governance and audit pricing and audit quality. Board reforms provide us a quasi-natural experiment setting to test the effect of governance structure, which mitigates an endogeneity concern, for example, increased audit fees in the postreform period could be driven by concurrent events (e.g., the adoption of IFRS or SOX, etc.) or unobservable factors, similar to the common endogeneity obstacle in corporate governance research.[5] Unlike prior research relying

[4] We acknowledge that country-level corporate board reforms may affect the legal environment for both clients and auditors. Based on Simunic (1980), both audit effort and litigation risk affect audit pricing decisions. Since mandatory board reforms are legally binding, not complying with the regulation will increase the client's litigation risk. Thus, the relationship between corporate board reforms and the client's legal environment will be more direct. However, the impact of corporate board reforms on the legal environment of auditors is rather a second-order effect because corporate board reform affects the litigation risk of auditors through changing the client's litigation risk. This is consistent with our hypothesis that boards demand higher audit quality/effort from the auditor to protect their reputation by replacing their non-Big N auditors with Big N auditors, which reduces the likelihood of restatements. Overall, our paper aims to show how increases in audit quality/effort due to demand affect audit pricing decisions by using switching to a Big N auditor as a potential channel.

[5] Gow, Larker, and Reiss (2016), Hermalin and Weisbach (2003), Wintoki, Linck, and Netter (2012) and Halperin and Lai (2014).

on a sample of firms in a single country (e.g., Huang et al., 2009)[6], we mitigate the endogeneity concern by exploiting staggered adoptions of board reforms across countries. In this setting, we are able to observe the changes in audit fees for firms in countries that experience board reforms in earlier periods (e.g., UK, Denmark and Australia) compared with firms in countries that experience board reforms in later periods (e.g., Spain, Norway and Hong Kong) and firms in countries that experience no board reforms (e.g., Brazil and Switzerland) after controlling for a set of the unknown firm- and audit-level characteristics. We further provide potential channels such as switching to more reputable auditors and improving information quality, which is consistent with a viewpoint that managers demand better-quality audits after board reforms.

Our second contribution is to international auditing literature by examining cross-sectional differences based on institutional characteristics by utilizing an international setting. By collecting comprehensive audit information and country-level characteristics of global firms, we find the association between board reforms and audit fees is more pronounced in countries with emerging capital markets, high political risk, weak governmental enforcement actions and low corporate governance quality, which is consistent with the theory of information acquisition cost. This finding contributes to extant studies documenting the effectiveness of independent directors on audit quality and audit fees, which depends on the richness of the information environment and strength of governance (Choi et al., 2008; Francis & Wang, 2008; Zhang & Yu, 2016; Chen et al., 2015; Duchin et al., 2010; Krishnan & Visvanathan, 2009; Karim et al., 2015; Gotti et al., 2012).

This paper proceeds as follows. Section 2 provides an institutional background and develops our hypotheses. Section 3 describes the sample selection process and primary empirical measures and provides descriptive statistics. Section 4 presents the main tests and additional analyses. Section 5 concludes.

2 | INSTITUTIONAL BACKGROUND AND HYPOTHESIS DEVELOPMENT

2.1 | Institutional background

Building an effective board is of paramount importance to a corporation. In 1992, the Cadbury Committee issued the *Code of Best Practice*, which recommends that boards of UK corporations include at least three outside directors and that the positions of CEO and chair be held by different individuals. Following the 1992 UK Cadbury Report, the worldwide wave of board reforms spread from developed capital markets to China, India and other emerging markets. Later on, the Enron scandal, in 2001, eventually led to the collapse of Arthur Andersen, one of the five largest accounting firms in the world. In response to the Enron-Anderson scandal and other high-profile corporate governance failures, new regulations and legislation related to board structure and composition, for example, the Sarbanes-Oxley (SOX) Act of 2002, were enacted to improve the reliability of financial reporting and increase the accountability of auditing firms to remain objective and independent of their clients. These reforms required all publicly traded firms to have a majority of independent directors on their boards, an audit committee and separate chair/CEO positions.[7] Audit committees provide oversight of financial reporting and processes, the selection of an external auditor, the effectiveness of internal control processes and regulatory compliance and so on. Therefore, there is a clear connection between the role of audit committees and auditors' selection, retention and compensation.

[6] Research exploiting a regulatory change with a sample of firms in a single country cannot effectively measure the effect of new regulation on audit fees since such regulation applies to all domestic firms and thus there is the lack of the reference group to compare.

[7] Although a board reform can involve board independence, audit committees and CEO/chairman duality, this paper focuses on overall board reform. Because most board reform involves both board independence and audit committees, we use major board reform as a main explanatory variable. However, we also examine how each reform component affects audit fees in Appendix B. Consistent with our baseline regression, each component also increases audit fees with statistical significance.

2.2 | Hypothesis development

Since the UK's Cadbury Report was issued in 1992, worldwide board reforms pertinent to the matter of corporate governance quality have drawn significant attention from investors, practitioners, regulators and academia (Dahya & McConnell, 2007). The underlying assumption is that board reforms would lead to better board oversight, which helps constrain executives from aggressive accounting treatments and extracting their private benefits at the expense of shareholders and other stakeholders. One of the potential benefits of an effective board is to improve the process by which auditors are selected, retained and compensated.

One stream of research spurred by the SOX and related regulations focuses on the impact of corporate governance on financial reporting quality and stock market performance. Only a few studies have addressed the association between corporate governance and auditing, under the premise that better governance oversight may affect auditing pricing and audit quality. To summarize, existing research on the effect of board structure and characteristics on audit fees typically focuses on a single country and yields mixed results. For example, using a sample of *Fortune 1000* companies, Carcello et al. (2002) find a more independent, diligent and expert board demands higher audit quality, which, as a result, increases audit work (audit fees). In contrast, Abbott et al. (2003) find that audit committee independence, financial expertise and meeting frequency are not associated with audit fees. On the contrary, using a sample of US firms, Tsui et al. (2001) and Griffin et al. (2008) even find that better governance reduces control risk and thereby lowers the cost of auditing. Using a sample of large UK companies in the post-Cadbury period, O'Sullivan (1999) suggests no association between audit fees and board and audit committee characteristics. Hence, we attempt to add to the auditing literature by testing the impact of worldwide board reforms on audit fees.

The audit fee model is generally stated as a function of audit effort and an expected liability loss due to future potential lawsuits, following audit fee literature (Simunic, 1980; Simunic & Stein, 1996; Ghosh & Pawlewicz, 2009). We conjecture that improvement in board structure could affect both audit effort and an expected liability loss simultaneously. On the one hand, extant literature shows that an effective board including independent directors and audit committees may require more audit effort (by performing sufficient and appropriate audit procedures) to provide high-quality assurance to protect directors' reputation and interests. As a result, we expect an increase in the cost of auditing. Alternatively, one may argue that high audit quality as an assurance service is likely to decrease expected legal losses. For example, Francis (2004) finds that auditors are more likely to detect and report accounting problems for clients with independent boards. Moreover, Ahmed and Duellman (2007) document that accounting conservatism is positively associated with outside directors' ownership but negatively with the percentage of insider directors. Zhao and Chen (2008) find that staggered boards are associated with a lower likelihood of committing fraud and smaller magnitudes of earnings management, which is consistent with the quiet life theory (Bertrand & Mullainathan, 2003). Taken together, such additional enhanced insurance may increase audit effort and reduce future legal losses.

Meanwhile, the efficacy of corporate governance may affect audit pricing if auditors consider a stronger board as one effective corporate governance mechanism. Generally, an effective board may help reduce internal control risk, and therefore, reduce the overall audit risk and audit fees (Griffin et al., 2008; Tsui et al., 2001). That is to say, if board reforms could improve the oversight of boards over financial reporting process and quality, auditors are likely to respond to an increase in reporting quality by either reducing their working hours/procedures or charging lower risk premiums to cover potential litigation losses, or both, when they perceive a client's accounting quality is high (Pratt & Stice, 1994). Extant literature also finds that an effective board can improve earnings quality by constraining management from manipulating earnings, which mitigates the information asymmetry between management and outsiders (Becker et al., 1998; Dhaliwal et al., 2010). In addition, the demand for high-quality audits may decline after board reforms because external and internal governance mechanisms are substitutes. With various advantages of board reforms, auditors may charge less by lowering their audit efforts or covering risk premiums in the future, due to less risk, more transparency and less information asymmetry. Collectively, we propose our first directional hypothesis.

Hypothesis 1: *All else equal, board reforms are positively associated with audit fees.*

Next, we further explore an alternative channel from the demand side of audit pricing decisions, when firms may switch up to high-quality audits from non-Big N to Big N auditors after board reforms. Prior studies find that Big N auditors provide high-quality audits (Francis & Yu, 2009; Palmrose, 1986). However, the decision to change an auditor is an endogenous decision of the firms. If board reforms strengthen corporate governance, managers may demand higher audit quality to protect their reputation or due to other career concerns. To improve audit quality, managers may ask for a higher audit effort by their existing auditor or change their auditor from a non-Big N to Big N. Thus, we expect that board reforms improve corporate governance, which motivates firms to increase the demand for high-quality audits by switching from non-Big N to Big N auditors. Furthermore, we hypothesize that an increase in audit fees is more pronounced for the firms switching their auditors from non-Big N to Big N than other firms. Therefore, we propose our next hypothesis.

Hypothesis 2: *All else equal, the effect of board reforms on audit fees is more significant for firms switching from non-Big N to Big N auditors.*

Besides switching up from non-Big N to Big N auditors, we further investigate how board reforms improve audit quality by reducing the likelihood of restatements. As reforms increase the legal liabilities of board members, independent directors and audit committees are motivated to demand high-quality audits to protect their reputation and to avoid potential litigation risk and labor market penalties (Srinivasan, 2005; Richardson, 2005; Street & Hermanson, 2019). Consequently, the higher the demand from clients for high-quality audits, the higher the financial reporting quality, which results in fewer restatements. Prior studies use restatements as a more direct measure of audit quality (DeFond & Zhang, 2014). Therefore, we hypothesize that firms are less likely to issue restatements in the postreform period.

Hypothesis 3: *All else equal, board reforms are negatively associated with the likelihood of restatements.*

Further, corporate financial reporting studies document that a board's structure can influence corporate transparency and information asymmetry. For example, extant research finds a positive association between the strength of corporate-governance characteristics (e.g., the proportion of independent directors, the presence of an independent audit committee, the number of board meetings, etc.) and accounting quality and earnings informativeness (Ahmed & Duellman, 2007; Armstrong et al., 2014; Duchin et al., 2010). In particular, several studies find a positive relationship between the board (and audit committee) independence and audit fees (Carcello et al., 2002; Abbott et al., 2003; Tsui et al., 2001; Griffin et al., 2008; Hines et al., 2015; Zhang & Yu, 2016).

Next, we examine how corporate board reforms influence information intermediaries and information production. Extant literature finds that analysts act as important information intermediaries by generating earnings forecasts, stock recommendations and other fundamental information for investors and other market participants. As a result, analyst forecasts improve corporate information transparency and eventually contribute to the overall efficiency of capital markets (Lang & Lundholm, 1996; Bushman et al., 2005; Hsu et al., 2017). Financial disclosure literature finds that a firm's board structure, including its proportion of independent directors and a separate audit committee, can influence various aspects of corporate information transparency, such as better voluntary forecasts (e.g., Petra, 2007; Ferreira et al., 2011). For example, Ahmed and Duellman (2007) find that timely recognition of loss is greater for firms with a higher proportion of independent directors. They suggest that earnings quality is positively associated with an effective corporate governance mechanism, independent directors. Thus, we also posit that board reform will promote higher levels of management voluntary disclosure, captured by management forecast frequency. Meanwhile, when an auditor provides a high-quality audit, it signals higher credibility of earnings information and reduces information

asymmetry, which thus improves analysts' earnings forecast accuracy (Audousset-Coulier et al., 2011). Therefore, we hypothesize that corporate information transparency is improved after board reforms.

Hypothesis 4: *All else equal, board reforms are positively associated with analyst forecast accuracy and management forecast frequency.*

3 | SAMPLE SELECTION AND RESEARCH DESIGN

3.1 | Sample selection

We obtain board reforms data from Kim and Lu (2013), Fauver et al. (2017) and Hu et al. (2020), and financial information from *Worldscope*. To carry out our empirical tests, we construct a set of variables, which include audit fees and client-, auditor-, analyst- and country-level characteristics. We also obtain analyst-related information from *I/B/E/S Academic*, management forecast information from *I/B/E/S Guidance*, and annual auditor information from the *Compustat Global* dataset. With the advantage of its extensive coverage for both US and international firms, our sampling period spans from 1990 to 2013. Since the earliest reform occurred in 1998 and the latest reform was imposed in 2006, our sampling period covers the board reforms comprehensively. Moreover, this sampling period enables us to conduct dynamic regressions to capture the timing of impact after board reforms for all 31 countries, including two nonreform countries for the benchmark.

While a majority of firm-level characteristics are available in *Worldscope*, there are some limitations associated with international auditing studies. First, several clients' financial information (e.g., sales, assets) across geographical locations may be missing, and the coverage started in 2002. Second, some of the auditors' information associated with a client is time-invariant. While existing literature shows that audit pricing is a function of a client's operating and financial complexity (Simunic, 1980) and auditor change (Jha & Chen, 2015), we are not able to construct an *exact* set of control variables employed in prior studies, which mostly use US firms. Instead, we include several alternative firm- and country-level control variables.

We further collect country-level variables from multiple datasets: the legal origin and the economic development (i.e., a developed or developing indicator) from professor Rafael La Porta's website[8]; consumer price index (e.g., Inflation) from the World Bank website[9]; and global governance index (e.g., perceptions of the ability of the government to formulate and implement policies and regulations) (Regqual), political stability (Polstab) and corporate governance effectiveness (Goveffect)) from the website of the Worldwide Governance Indicators (WGI) project.[10]

To be included in our analyses, we require firms to have all control variables available. Our final sample, therefore, includes 87,504 firm-year observations across 31 countries during a sample period of 1990–2013. Appendix A of Kim and Lu (2013) and appendix A1 of Fauver et al. (2017) provide a summary of board reforms in each country.

3.2 | Audit fee model

To analyze the effect of board reforms on audit pricing, we primarily compare the audit fees in the prereform and postreform periods. By exploiting staggered board reforms worldwide, this setting makes a natural experiment that

[8] http://faculty.tuck.dartmouth.edu/rafael-laporta/research-publications/

[9] http://datacatalog.worldbank.org/

[10] info.worldbank.org/governance/wgi/index.aspx#home

mitigates the undesirable endogeneity and self-selection bias. Specifically, our equation (1) is described as follows:

$$\text{Ln (AuditFee)} = \beta_0 + \beta_1 \text{ (PostReform)} + \sum \beta_m \text{ (Controls)} + \sum \beta_n \text{ (FE)} + \varepsilon_{it} \quad (1)$$

The dependent variable, Ln(AuditFee), is the natural logarithm of a client's annual audit fee converted to US dollars. Our variable of interest is PostReform, a dummy variable that equals one (zero) for years after (before) each country undergoes a major corporate board reform. Following DeFond and Zhang (2014), we include a typical set of control variables such as firm size (ln(Assets)), financial risk (ROA, LOSS, Leverage and InvRec), operating complexity (ForeignAssets, QuickRatio and Tangible) and auditor-related characteristics (UnQualified, BigN, AuditorTenure, AuditorRep and AuditorIndSpec).[11] Since we conduct research in an international setting, some control variables used in prior literature may not be available. For example, existing literature has documented that going-concern opinion and audit firm reputation increase audit fees (Francis et al., 2005; Fung et al., 2012). We replace going-concern opinion with clean audit opinion (i.e., UnQualified) due to the limitation of going-concern data availability. To supplement time-invariant auditor characteristics, we also construct three auditor-related variables: AuditorRep, the fee-basis market share of auditors to measure overall auditors' reputation (e.g., Simunic, 1980); AuditorIndSpec, the fee-basis market share of auditors in a specific industry to quantify auditors' industry knowledge (e.g., Reichelt & Wang, 2010; Bills et al., 2014); and BigN, a Big N auditor indicator variable.[12] We include either BigN or AuditorRep, and an indicator variable, AuditorIndSpec, in the regressions.[13] Additionally, we added analyst-level control variables, such as EPS_Vol, Disp, Horiz and |ΔEPS| by following Byard et al. (2006) and Duru and Reeb (2002). For country-level variables, we include whether a client is cross-listed in another country (CrossList) and has adopted international financial reporting standards (IFRS), log-transformed GDP and inflation rate (Inflation) as shown in Kim et al. (2012). Furthermore, we also examine how country-level characteristics affect audit pricing decisions by using the following variables: emerging versus the developed market (Emerging), civil versus common law country (Civillaw) and the perception of the likelihood of political instability (Polstab). Last, Seetharaman et al. (2002) find that a legal environment that increases corporate litigation risk is positively associated with audit fees. Thus, we include the index that measures perceptions of the ability of the government to formulate and implement policies and regulations (i.e., Regqual). For all our regression models, we include country, industry and year-fixed effects. Standard errors are clustered at the country level since the implementation of board reform in a certain country may interactively affect firms within the country. Appendix A provides detailed variable definitions.

3.3 | Descriptive statistics

Table 1 reports summary statistics of audit fees, types and components of board reforms and control variables for the period of 1990–2013. We winsorized all continuous variables at the 1st and 99th percentiles. The average audit fee is $1,348,000 (corresponding to a natural logarithm value of 12.60). The mean value of PostReform is 0.831, indicating about 83.1% of the sample is in the postreform period, and 16.9% is in the prereform period. More specifically, we classify board reforms into two different components, board independence and audit committee. Based on the mean values of each component of board reforms, 81.2% of the samples involve board independence and 82.4% involve audit

[11] Please see Table 3 in DeFond and Zhang (2014, p. 291). For additional reference, we follow existing literature such as Carcello et al. (2002), Ettredge, Li, and Scholz (2007), Fauver et al. (2017), Ghosh and Pawlewicz (2009), Griffin et al. (2008), Hoitash, Hoitash, and Bedard (2008) and Hay, Knechel, and Wong (2006).

[12] To be more specific, we define AuditorIndSpec as a dummy variable that takes the value of one if an auditor accounts for more than 30% of the fee-basis market share in a specific industry and zero otherwise.

[13] In Table 5, it is not appropriate to use Big N auditors as a control variable because the dependent variable is switching to Big N auditors. Thus, we use an auditor's market share as an alternative control variable. Moreover, our results are still consistent by replacing BigN indicator variable with AuditorRep, a continuous variable.

TABLE 1 Descriptive statistics

	N	Mean	Median	Std. Dev.	25th Pctl	75th Pctl
PostReform	87,504	0.831	1	0.375	1	1
PostReform^{Indep}	87,504	0.812	1	0.391	1	1
PostReform^{Audit}	87,504	0.824	1	0.381	1	1
Regulation	87,504	0.530	1	0.499	0	1
AuditFee (US $ million)	87,504	1.348	0.298	3.407	0.089	1.002
Ln(AuditFee)	87,504	12.60	12.61	1.803	11.40	13.82
Restatement	87,504	0.172	0	0.377	0	0
AnalystAccuracy	33,346	−0.044	−0.010	0.841	−0.025	−0.004
ManagementFrequency	20,731	1.638	1.792	1.212	0	2.639
SwitchUp	87,504	0.102	0	0.303	0	0
SwitchDown	87,504	0.107	0	0.310	0	0
Assets (US $ million)	87,504	2,386.54	217.72	9,330.52	52.931	975.348
Ln(Assets)	87,504	19.25	19.20	2.240	17.78	20.70
ForeignAssets	87,504	0.151	0.00967	0.243	0	0.214
Tangible	87,504	0.295	0.244	0.236	0.0948	0.443
QuickRatio	87,504	1.856	1.035	3.139	0.656	1.752
InvRec	87,504	0.302	0.284	0.204	0.129	0.442
ROA	87,504	−0.0471	0.0616	0.658	0	0.113
Loss	87,504	0.250	0	0.433	0	0
Leverage	87,504	0.251	0.188	0.359	0.0393	0.343
Ln(#Analysts)	87,504	1.877	1.946	1.592	0	3.296
AuditorRep	87,504	0.155	0.0761	0.221	0.000272	0.208
AuditorIndSpec	87,504	0.138	0	0.345	0	0
AuditorTenure	87,504	7.688	6	5.888	3	11
BigN	87,504	0.576	1	0.494	0	1
UnQualified	87,504	0.949	1	0.219	1	1
CrossList	87,504	0.0431	0	0.203	0	0
IFRS	87,504	0.194	0	0.395	0	0
Inflation	87,504	2.709	2.323	2.511	1.464	3.324
EPS_Vol	33,346	0.125	0.021	6.067	0.011	0.048
Disp	33,346	0.054	0.010	2.498	0.005	0.023
Horiz	33,346	211.000	210.600	41.080	192.600	228.600
|ΔEPS|	33,346	3.861	0.357	47.636	0.106	1.352
RuleLaw	87,504	1.287	1.550	0.625	1.320	1.630
Emerging	87,504	0.196	0	0.397	0	0
Civillaw	87,504	0.162	0	0.369	0	0
Regqual	87,504	0.331	0	0.470	0	1
Goveffect	87,504	0.322	0	0.467	0	1
Polstab	87,504	0.338	0	0.473	0	1

This table presents descriptive statistics on the sample firms across 31 countries from 1990 to 2013. Detailed definitions of variables are included in Appendix A.

committee reform. Meanwhile, board reforms could be categorized into two different approaches, mandated by law or comply-or-explain, based on the enforcement level. The regulation indicates the portion of firms located in a country with mandatory board reforms. As can be seen in Table 1, 53% of our sample belongs to a country with rule-based enforcement. Moreover, the average firm has a mean of US $2.39 billion in assets and a median of US $217 million in assets. On average, 57.6% of the samples are audited by Big N auditors, and an auditor's market share in a given country and year (AuditorRep) is 15.5%. Therefore, international audit markets are relatively diversified. In addition, 19.4% of firms adopted the IFRS accounting standard, and 4.3% of firms are cross-listed on one or more foreign stock exchanges in a given year.

Table 2 presents the sample distribution across countries. If some countries went through board reforms over a few years, we use major reform years for our main analyses. Among 31 countries, the US has the largest number of firms, with 28,829 out of 87,504 firm-year observations. The Netherlands has the smallest number of firms in our final sample, with 365 firm-year observations. A majority of major reforms took effect in the early 2000s, ranging from 1998 to 2006. Especially, Brazil and Switzerland serve as benchmark countries that did not go through corporate board reform, related to board independence and audit committee, in our sample period. Taking Australia as an example to illustrate an interpretation of Table 2, Australia went through its board reform in 2004. Based on the fourth column of Table 2, PostReform indicates 67.2% for Australia; that is, approximately 3903 (of 5809) firm-year observations are in the postreform period. Following the "comply-or-explain" approach, Australian board reforms involve board and audit committee independence. The last column of Table 2 shows the median audit fee (measured in US dollars) for each country, ranging from the US $19,000 in Pakistan to the US $1.9 million in the Netherlands.

Table 3 reports Pearson correlations between our variables of interest, Ln(AuditFee) and PostReform, and key control variables. The correlation coefficients with * denote the 5% significance level or above. First, PostReform is positively correlated with Ln(AuditFee). In other words, the higher the audit quality demanded by stronger boards after reforms, or the more information that auditors access, the higher the fees auditors charge to their clients. Regarding control variables, the correlation coefficient between Ln(AuditFee) and Ln(Assets) is 0.77, supporting Simunic's (1980) finding that larger firms generally require more work (or effort) from auditors. Ln(AuditFee) is positively correlated with Ln(#Analysts), with a correlation of 0.50. Meanwhile, the correlation between Ln(#Analysts) and Ln(Assets) is 0.72, suggesting analysts are more likely to follow large firms. Additionally, audit fees are positively associated with return on assets, foreign assets, auditor reputation, auditor industry specialty, IFRS adoption, Big N auditor and cross-listing. Moreover, the relatively small values of correlation coefficients between PostReform and other control variables indicate that multicollinearity is not a concern.[14]

4 | EMPIRICAL RESULTS

4.1 | Board reform and audit fees

Table 4 shows the empirical analysis of our first hypothesis. It presents estimates from both OLS and dynamic regressions with the dependent variable, Ln(AuditFee), the natural logarithm of audit fees. Column (1) presents the OLS regression using industry, country and year fixed effects. Our main variable of interest is PostReform_t. More importantly, audit fees increase by 15.7% on average in column (1), which is significant at the 5% level after board reforms. This result shows a statistically and economically significant overall impact of board reforms on audit fees. For example, we find that audit fees increase by about $229,160 (= (exp(0.157) − 1) × 1,348,000) since the mean value of audit fees is $1,348,000.

[14] We also calculated Variance Inflation Factor (VIF) for each variable and checked the mean value, which was 1.55. The mean VIF is smaller than 4. Therefore, we can rule out the multicollinearity concern.

TABLE 2 Sample distribution by country

Country	*N*	Reform Year	PostReform	Independ	AuditCom	Regulation	Median AuditFee (US $)
Australia	5809	2004	0.672	1	1	0	0.181
Austria	152	2004	0.993	1	1	0	0.415
Belgium	248	2005	0.995	1	1	0	0.503
Brazil	22		0	0	0	0	0.688
Canada	4	2004	1	1	1	1	2.083
China	2507	2001	0.991	1	1	1	0.132
Denmark	390	2001	0.871	1	0	0	0.587
Finland	517	2004	0.994	1	1	0	0.660
France	1130	2003	1	0	1	1	0.831
Germany	1719	2002	0.997	1	1	0	0.556
Greece	35	2002	0.885	1	1	1	0.133
Hong Kong	449	2005	0.697	1	1	0	0.215
India	6856	2002	0.974	1	1	1	0.024
Israel	183	2000	0.994	1	1	1	0.528
Italy	575	2006	0.923	1	1	1	0.505
Japan	5663	2002	1	1	1	1	0.441
Malaysia	6023	2001	0.803	1	1	0	0.039
Netherlands	365	2004	0.931	1	1	0	1.927
Norway	538	2005	0.819	1	1	0	0.606
Pakistan	723	2002	0.731	0	1	0	0.019
Philippines	77	2002	0.974	1	1	0	0.124
Poland	255	2002	1	1	0	0	0.090
Portugal	87	2001	0.988	1	1	1	0.803
Singapore	391	2003	0.627	1	1	0	0.133
South Korea	459	1999	1	1	1	1	0.095
Spain	490	2006	0.861	1	1	0	0.920
Sweden	899	2006	0.727	1	1	0	0.759
Switzerland	856		0	0	0	0	0.961
Thailand	38	2002	0.973	1	1	0	0.054
United Kingdom	14,215	1998	0.764	1	1	0	0.308
United States	28,829	2003	0.863	1	1	1	0.732

This table presents the distribution of sample firms and audit fees in US dollars across countries. Reform Year is years that a country *j* experiences a board reform. PostReform(%) is the percentage of sample firms after the board reform. Restate is equal to one if the financial statement is restated in a given fiscal year and zero otherwise. Independ is equal to one if the board reform is associated with board independence and zero otherwise. AuditCom is equal to one if the board reform is associated with audit committee independence and zero otherwise. Regulation is equal to one if the board reform is mandated by regulation and zero otherwise (i.e., comply or explain). Median Audit Fee is the median value of audit fees in a given country. Please find details of board reforms in Appendix A of Fauver et al. (2017).

TABLE 3 Correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)
(1) Ln(AuditFee)	1																							
(2) PostReform	0.04*	1																						
(3) AnalystAccuracy	0.04*	−0.01	1																					
(4) ManagementFreq	0.19*	0.16*	0.05*	1																				
(5) Ln(Assets)	0.77*	−0.02*	0.06*	0.10*	1																			
(6) ForeignAssets	0.27*	−0.03*	0.00	−0.20*	0.21*	1																		
(7) Tangible	−0.01	−0.02*	−0.00	−0.12*	0.25*	0.01	1																	
(8) QuickRatio	−0.23*	0.00	0.01*	0.01*	−0.29*	−0.12*	−0.26*	1																
(9) InvRec	−0.04*	−0.02*	−0.01	−0.04*	−0.16*	0.05*	−0.36*	−0.22*	1															
(10) ROA	0.12*	0.01	0.19*	0.06*	0.23*	0.07*	0.07*	−0.07	0.11*	1														
(11) Loss	−0.16*	0.01	−0.20*	−0.05*	−0.29*	−0.08*	−0.10*	0.16*	−0.16*	−0.39*	1													
(12) Leverage	0.15*	−0.00	−0.11*	−0.03*	0.23*	0.02*	0.27*	−0.20*	−0.04*	−0.46*	0.12*	1												
(13) Ln(#Analysts)	0.50*	−0.07*	0.09*	0.06*	0.72*	0.20*	0.24*	−0.09*	−0.12*	0.17*	−0.24*	−0.08*	1											
(14) CrossList	0.26*	−0.07*	0.013	−0.06*	0.30*	0.17*	0.07*	−0.01*	−0.05*	0.02*	−0.04*	0.05	0.18*	1										
(15) AuditorRep	0.10*	−0.03*	0.02*	0.03*	0.10*	0.02*	0.01	−0.01*	−0.04*	0.08*	−0.09*	−0.06*	0.25*	0.03*	1									
(16) BigN	0.17*	−0.03*	0.04*	0.05*	0.16*	0.04*	−0.00	−0.01*	−0.08*	0.12*	−0.10*	−0.09*	0.40*	0.05*	0.35*	1								
(17) AuditorIndSpec	0.17*	−0.08*	0.01*	−0.16*	0.21*	0.19*	0.05*	−0.04*	−0.02*	0.06*	−0.09*	−0.00	0.18*	0.09*	0.15*	0.18*	1							
(18) Restatement	0.13*	0.10*	0.00	0.02*	0.13*	0.04*	−0.01	−0.03*	−0.00	0.03*	−0.03*	0.00	0.03*	0.03*	−0.01	0.06	0.03*	1						
(19) UnQualified	0.00	−0.00	0.08*	0.01	0.03*	0.00	−0.05	0.02*	0.06*	0.37*	−0.23*	−0.29*	0.17*	0.02*	0.08*	0.12*	0.05*	0.03*	1					
(20) AuditorTenure	0.22*	0.11*	0.05*	0.18*	0.21*	−0.01	−0.02*	−0.04*	0.02*	0.05*	−0.12*	0.0037	0.17*	0.05*	0.05*	−0.03*	−0.03*	0.04*	0.05*	1				
(21) IFRS	0.06*	0.01	0.00	−0.34*	0.13*	0.39*	−0.01	0.02*	−0.03*	0.02*	0.01*	−0.05*	0.12*	0.04*	0.03*	0.08*	0.17*	0.10*	0.01*	−0.11*	1			
(22) RuleLaw	0.15*	0.02*	0.00	−0.02*	−0.09	0.14*	−0.03*	0.07*	−0.11*	−0.08*	0.14*	−0.04*	0.25*	0.02*	0.16*	0.30*	0.06*	−0.09*	−0.05*	−0.02*	0.21*	1		
(23) Ln(GDP)	0.08*	−0.01	−0.02*	0.13*	0.07*	0.03*	−0.04*	−0.03	0.00	0.02*	−0.04*	−0.01*	0.02*	0.06	0.01*	−0.26*	−0.01*	−0.01*	0.032	0.36*	−0.02*	0.05*	1	
(24) Inflation	−0.08*	0.17*	0.01	0.02*	−0.02*	−0.02*	−0.00	−0.03*	0.08*	0.03*	−0.06*	0.05*	−0.17*	0.01	−0.14*	−0.16*	−0.05*	0.13*	0.06	−0.04*	−0.06*	−0.52*	−0.21*	1

This table presents the Pearson correlation coefficients. If the *p* value is less than 5%, we denote it with *. Detailed definitions of variables are included in Appendix A.

TABLE 4 Board reform and audit fee

Variables	Expected sign	(1) Dependent variable: Ln(AuditFee)$_t$	(2) Dependent variable: Ln(AuditFee)$_t$
PreReform$_{t-3}$			0.045
			(0.82)
PreReform$_{t-2}$			0.038
			(0.70)
PreReform$_{t-1}$			−0.000
			(−0.01)
PostReform$_t$	(+/−)	0.157**	0.066
		(2.71)	(1.13)
PostReform$_{t+1}$			0.202***
			(2.87)
PostReform$_{\geq t+2}$			0.202*
			(1.77)
Ln(Assets)$_t$	(+)	0.543***	0.543***
		(32.10)	(31.96)
ForeignAssets$_t$	(+)	0.524***	0.526***
		(6.98)	(6.96)
Tangible$_t$	(−)	−0.554***	−0.554***
		(−13.76)	(−13.71)
QuickRatio$_t$	(−)	−0.027***	−0.027***
		(−8.19)	(−8.23)
InvRec$_t$	(+)	0.212**	0.212**
		(2.69)	(2.70)
ROA$_t$	(−)	−0.153***	−0.152***
		(−6.13)	(−6.14)
Loss$_t$	(+)	0.145***	0.144***
		(16.49)	(17.08)
Leverage$_t$	(+)	0.092***	0.092***
		(3.02)	(3.04)
Ln(#Analysts)$_t$	(−)	0.039***	0.039***
		(3.56)	(3.50)
CrossList$_t$	(+)	0.225***	0.225***
		(5.95)	(6.02)
BigN$_t$	(+)	0.292***	0.293***
		(5.98)	(5.99)
AuditorIndSpec$_t$	(+/−)	0.286***	0.286***
		(10.17)	(10.11)
UnQualified$_t$	(−)	−0.007*	−0.007*
		(−1.75)	(−1.75)

(Continues)

TABLE 4 (Continued)

Variables	Expected sign	(1) Dependent variable: Ln(AuditFee)$_t$	(2) Dependent variable: Ln(AuditFee)$_t$
AuditorTenure$_t$	(+/−)	−0.069***	−0.070***
		(−4.45)	(−4.50)
IFRS$_t$	(+/−)	−0.037	−0.022
		(−0.43)	(−0.26)
RuleLaw	(+/−)	−0.236	−0.227
		(−1.23)	(−1.10)
Ln(GDP)$_t$	(+/−)	0.295	0.308
		(1.30)	(1.33)
Inflation$_t$	(+/−)	−0.027**	−0.027**
		(−2.56)	(−2.56)
Constant		1.037	0.949
		(0.80)	(0.71)
Industry FE		Yes	Yes
Year FE		Yes	Yes
Country FE		Yes	Yes
Observations		87,504	87,504
Adj. R^2		0.835	0.835

This table reports the impacts of two different components of board reforms on audit fees. Detailed definitions of variables are included in Appendix A. Numbers in parentheses are *t*-statistics calculated using standard errors clustered at the country level. ***, ** and * indicate a two-tailed test significance level at 1, 5 and 10%, respectively.

Next, column (2) shows the regression result based on the dynamic regression specification. To test the timing impact of board reforms on audit fees, we include a series of PreReform$_{t-3,}$ PreReform$_{t-2}$, PreReform$_{t-1}$, PostReform$_t$, PostReform$_{t+1}$ and PostReform$_{\geq t+2}$ by following Bertrand and Mullainathan (2003). Sets of PreReform$_{t-n}$ ($n = 1, 2$ and 3) and PostReform$_{t+n}$ ($n = 0$, 1 and ≥2) are indicators that equal one for country *j* in the *n*th year relative to the year of a board reform. While the coefficients on PreReform$_{t-3}$, PreReform$_{t-2}$ and PreReform$_{t-1}$ capture the effect of board reforms on audit fees 3, 2 and 1 year prior to reforms, the coefficients on PostReform$_t$, PostReform$_{t+1}$ and PostReform$_{\geq t+2}$ capture the effect of the year that a country undergoes board reforms, 1 year after reforms and 2 years and afterward, respectively (Simintzi et al., 2014; Klasa et al., 2017). The coefficients on PreReform$_{t-3}$, PreReform$_{t-2}$, PreReform$_{t-1}$ and PostReform$_t$ are not statistically significant, indicating the positive association between board reforms and audit fees is not driven by the preexisting condition (see Figure 1). In contrast, coefficients on PostReform$_{t+1}$ and PostReform$_{\geq t+2}$ are positive and significant at the 1% level. More specifically, the overall impact of board reforms is about a 22.4% increase (= exp(0.202) − 1) in audit fees after 1 year following reforms and afterward. Interestingly, the corporate board reform effect on audit fees lasts after 2 years and afterward. Through overall governance reforms, we are able to show that the increase in audit fees is greater in subsequent years after board reforms. The positive and significant relation between board reforms in the post period and audit fees is consistent with extant literature (Carcello et al., 2002; Abbott et al., 2003; Zhang & Yu, 2016), indicating that an effective board demands higher audit quality (greater assurance), requiring more audit effort, which leads to higher audit fees. For average sample firms, an incremental increase in audit fees is equivalent to $301,747 (= (exp(0.202)−1) × 1,348,000) 1 year after reforms, and a similar increase 2 or more years subsequent to reforms. Taken together, we find a causal effect of board reforms on audit fees.

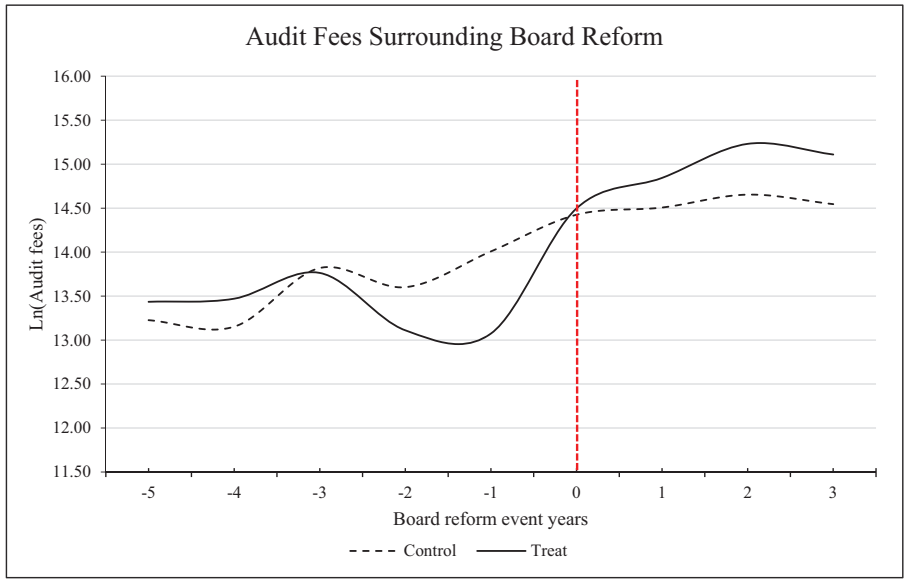

FIGURE 1 Graphical illustration of audit fees around country-level board reform. This figure shows a graphical illustration of the parallel trend of our empirical framework, which shows audit fees surrounding board reform based on the two groups. The treatment group (solid line) consists of the firms that belong to the countries that went through the board reform in a given year. In the same vein, the control group (dashed line) consists of the firms in the countries prior to the board reform in a given year. Year 0 with a red vertical line indicates the adoption year of board reforms.

Regarding client characteristics, our results are consistent with prior literature. That is, audit fees are positively related to total assets, foreign assets and the sum of inventory and accounts receivable (Simunic, 1980); Big N auditors and industry specialty (Reichelt & Wang, 2010); and a firm's intangible assets and leverage and cross-listing (Seetharaman et al., 2002; Choi et al., 2009; and Kim et al., 2012).[15] While Kim et al. (2012) show that audit fees increase after European firms adopt the IFRS, a coefficient of IFRS is insignificant in our results. We speculate that this difference arises from heterogeneous sample compositions with a different set of fixed-effects models. Furthermore, we clustered standard errors at the country level since domestic firms' audit fees might be jointly determined by auditors within a country.[16] For other country-level control variables, countries with a higher GDP charge higher audit fees but lower with inflation. With this cross-checking between our findings and those of prior studies, we confirm that our regression models are valid. Furthermore, we conduct additional tests on how different types and components of corporate board reforms affect auditor pricing decisions. Following the previous literature, we classify board reforms into two different types: reforms involving board independence or audit committees. Based on columns (1), (3) and (5) of Appendix B, the impact of board reforms involving board independence is slightly greater than that of board reforms involving audit committees. In a similar vein, we investigate the moderating effect of enforcement level, rule-based versus "comply-or-explain" reforms, on the association between board reforms and audit fees in Appendix C. We interact Regulation with $PostReform^{Indep}{}_t$, $PostReform^{Audit}{}_t$ and $PostReform^{Duality}{}_t$. The first treatment group is

[15] Choi et al. (2008) provide theoretical and empirical evidence that audit pricing and Big 4 premium are affected by the strength of a country's legal liability regime. They document the positive (negative) effect of a country's legal regime on audit fees (or Big 4 premium) is more pronounced for small clients than large clients. In contrast, Francis and Wang (2008) argue that earnings (audit) quality is jointly affected by a country's investor protection regime where a firm is located and whether a firm chooses Big 4 or non-Big 4 as its auditor. Contrary to Choi et al.'s (2008) findings, Francis and Wang document that audit quality increases only for Big 4 auditors, but not for non-Big 4 auditors, after a country's legal and regulatory regime becomes more onerous. In our study, we find that any type of cross-listing increases audit fees after a firm is initially cross-listed on a foreign stock exchange.

[16] As a robustness check, we clustered standard errors at the country and year, and at the firm and year. Results are reported in Table 8.

defined as firms with rule-based (mandatory) board reforms and the control group as firms with comply-or-explain board reforms. Based on Appendices B and C, all interaction terms are positive and statistically significant. Taken together, we conclude that board reform enforcement levels make a significant difference in audit pricing decisions.

4.2 | Board reform and auditor switch

To strengthen our hypothesis, we first test the demand side of audit pricing decisions. Corporate board reform reduces agency costs by enhancing the monitoring role of independent board members and audit committees. Based on our sample, all countries' reform involves either board independence or audit committees, except Brazil and Switzerland. Thus, improved board composition and audit committees may demand high-quality audits in order to protect their reputation and future career (Carcello et al., 2002; Abbott et al., 2003; Zhang & Yu, 2016).

Table 5 presents the empirical analysis of our second hypothesis. We focus on the firms that switch from non-Big N to Big N auditors or from Big N to non-Big N auditors, which represents an endogenous choice of the firm. If a firm switches from non-Big N to Big N auditors (Big N to non-Big N auditors), the choice represents the increased demand for high-quality (low-quality) audits, which affects audit pricing decisions.[17] We define Big N auditors as Big 6 from 1994 to 1997; Big 5 from 1998 to 2001; and Big 4 from 2002 and onward. To carry out our empirical test, we merged our original data with a Compustat Global dataset in order to obtain annual auditor information. However, the firm fundamentals, such as size, foreign assets and tangible assets, are similar to the original sample. Among the 15,326 unique firms, 1,283 firms changed their auditors from non-Big N to Big N auditors. Moreover, 1,497 firms shifted from Big N auditors to non-Big N auditors after the board reform.

In column (1), we show that both coefficients of PostReform and SwitchUp are positively related to audit fees, which is consistent with previous studies that show a Big N auditor charges higher audit fees due to higher audit quality and effort.[18] Next, we interact PostReform and SwitchUp to examine how audit pricing differs across different demands of auditing. Based on the interaction terms in columns (2)–(5), $\text{PostReform}_t \times \text{SwitchUp}$ and $\text{PostReform}_{\geq t+2} \times \text{SwitchUp}$, audit fees increase by around 9.41% (= exp(0.09) − 1) for the group of firms that switch their auditors to Big N auditors compared with the firms that did not shift to Big N. In columns (4) and (5), we limit our samples by focusing on the sample period [−4, +4] around board reforms in each country and find consistent results with both statistical and economical significances. More importantly, we did not find evidence on changing in audit fees for the firms that switch their Big N to non-Big N auditors. Both standalone, SwitchDown_t, and interaction terms, $\text{PostReform}_{\geq t+2} \times \text{SwitchDown}_t$, show insignificant coefficients. Although the interaction term shows negative coefficients, which indicates auditors may charge lower audit fees to the clients that demand lower audit quality after the board reform, it is not statistically significant.

We confirm that the increase in audit fees after board reforms is concentrated in the group of firms that change their auditors to Big N. However, we do not find evidence that auditors may charge lower audit fees to the clients that demand a lower audit quality after the country-level board reform. It is consistent with our argument that board reform increases the demand for higher audit quality to protect board members' reputations and future careers.

4.3 | Board reform and the likelihood of restatement

In the previous sections, we showed that corporate boards demand higher audit quality by changing their auditors to Big N. We further extend our analyses to examine whether auditors provide higher quality audits in response to

[17] We appreciate comments from the anonymous referee on including clients that change their Big N to non-Big N auditors.

[18] We appreciate comments from the anonymous referee on using auditor industry specialist as an alternative proxy for demanding higher audit quality of audit after the board reform. To be more specific, we find a coefficient of 0.012 with 5% statistical significance for PostReform.

TABLE 5 Board reform and auditor switch

	(1)	(2)	(3)	(4)	(5)
		Full Sample		[−4, +4]	
Dependent variable	$SwitchUp_t$	$Ln(AuditFee)_t$			
$PreReform_{t-3}$		0.052	0.059	0.018	0.024
		(0.87)	(0.94)	(0.87)	(1.02)
$SwitchUp_t$		−0.008	−0.029	−0.019	−0.029
		(−0.14)	(−0.59)	(−0.37)	(−0.81)
$PreReform_{t-3} \times SwitchUp_t$		−0.070	−0.051	−0.030	−0.005
		(−1.24)	(−0.98)	(−0.62)	(−0.12)
$PreReform_{t-2}$		0.044	0.043	0.020	0.018
		(0.82)	(0.81)	(0.73)	(0.64)
$PreReform_{t-2} \times SwitchUp_t$		−0.045	−0.051	−0.007	−0.007
		(−1.10)	(−1.23)	(−0.16)	(−0.13)
$PreReform_{t-1}$		0.016	0.014	−0.062	−0.064
		(0.33)	(0.29)	(−1.16)	(−1.25)
$PreReform_{t-1} \times SwitchUp_t$		0.056	0.049	0.024	0.010
		(1.11)	(0.97)	(0.52)	(0.25)
$PostReform_t$	0.016*	0.070	0.069	−0.059	−0.060
	(1.90)	(1.18)	(1.20)	(−0.66)	(−0.70)
$PostReform_t \times SwitchUp_t$		0.092*	0.091*	0.092*	0.080*
		(1.89)	(1.77)	(1.89)	(1.80)
$PostReform_{t+1}$		0.201***	0.202***	0.018	0.019
		(2.88)	(2.94)	(0.13)	(0.15)
$PostReform_{t+1} \times SwitchUp_t$		0.070	0.075	0.097	0.089
		(1.00)	(1.26)	(1.29)	(1.50)
$PostReform_{\geq t+2}$		0.195	0.201*	0.000	0.008
		(1.63)	(1.70)	(0.00)	(0.06)
$PostReform_{\geq t+2} \times SwitchUp_t$		0.099	0.126*	0.100*	0.104**
		(1.43)	(1.89)	(1.82)	(2.14)
$SwitchDown_t$			0.085		0.048
			(1.22)		(0.60)
$PostReform_{t-3} \times SwitchDown_t$			−0.039		−0.056
			(−1.58)		(−1.54)
$PostReform_{t-2} \times SwitchDown_t$			0.016		−0.002
			(0.30)		(−0.04)
$PostReform_{t-1} \times SwitchDown_t$			0.030		0.058
			(0.54)		(0.90)
$PostReform_{t-1} \times SwitchDown_t$			−0.014		0.028
			(−0.21)		(0.37)

(Continues)

TABLE 5 (Continued)

	(1)	(2)	(3)	(4)	(5)
	Full Sample			[−4, +4]	
Dependent variable	**SwitchUp$_t$**	**Ln(AuditFee)$_t$**			
PostReform$_{t-1}$ × SwitchDown$_t$			−0.041		0.009
			(−0.55)		(0.10)
PostReform$_{\geq t+2}$ × SwitchDown$_t$			−0.099		−0.025
			(−1.37)		(−0.28)
Ln(Assets)$_t$	0.012*	0.561***	0.561***	0.579***	0.579***
	(1.78)	(38.27)	(38.19)	(43.68)	(43.55)
ForeignAssets$_t$	0.018	0.520***	0.520***	0.543***	0.543***
	(0.96)	(6.65)	(6.67)	(4.45)	(4.47)
Tangible$_t$	−0.001	−0.556***	−0.556***	−0.552***	−0.554***
	(−0.06)	(−13.26)	(−13.46)	(−10.95)	(−11.20)
QuickRatio$_t$	−0.001	−0.027***	−0.027***	−0.028***	−0.028***
	(−0.85)	(−8.27)	(−8.28)	(−8.98)	(−8.97)
InvRec$_t$	0.022	0.204**	0.203**	0.264***	0.262***
	(1.23)	(2.50)	(2.49)	(3.88)	(3.85)
ROA$_t$	−0.006	−0.154***	−0.154***	−0.140***	−0.140***
	(−1.62)	(−6.53)	(−6.50)	(−8.41)	(−8.33)
Loss$_t$	0.002	0.142***	0.141***	0.160***	0.159***
	(0.36)	(15.16)	(15.30)	(11.71)	(11.77)
Leverage$_t$	−0.011*	0.085**	0.084**	0.097***	0.097***
	(−1.96)	(2.55)	(2.53)	(3.72)	(3.70)
Ln(#Analysts)$_t$	0.000	0.053***	0.053***	0.037***	0.037***
	(0.10)	(4.51)	(4.50)	(4.06)	(4.13)
CrossList$_t$	0.021*	0.202***	0.202***	0.195***	0.194***
	(1.73)	(5.38)	(5.40)	(6.12)	(6.11)
AuditorIndSpec$_t$	0.013	0.303***	0.303***	0.279***	0.280***
	(1.61)	(10.46)	(10.49)	(7.67)	(7.70)
AuditorTenure$_t$	−0.012***	−0.005	−0.005	−0.001	−0.001
	(−3.13)	(−1.08)	(−1.12)	(−0.40)	(−0.26)
UnQualified$_t$	0.002	−0.043***	−0.042***	−0.075***	−0.073***
	(0.23)	(−3.02)	(−2.96)	(−5.01)	(−4.97)
IFRS$_t$	−0.033**	0.004	0.003	−0.021	−0.023
	(−2.39)	(0.05)	(0.03)	(−0.19)	(−0.21)
RuleLaw	0.037	−0.196	−0.196	−0.566	−0.567
	(1.56)	(−0.98)	(−0.99)	(−1.55)	(−1.56)
Ln(GDP)$_t$	0.009	0.355	0.353	−0.822	−0.811
	(0.28)	(1.54)	(1.53)	(−1.63)	(−1.61)

(Continues)

TABLE 5 (Continued)

	(1)	(2)	(3)	(4)	(5)
	Full Sample			[−4, +4]	
Dependent variable	$SwitchUp_t$	$Ln(AuditFee)_t$			
$Inflation_t$	0.003**	−0.028**	−0.028**	−0.026	−0.026
	(2.36)	(−2.62)	(−2.57)	(−1.18)	(−1.17)
Constant	−0.139	0.461	0.460	5.448**	5.398**
	(−0.82)	(0.35)	(0.35)	(2.33)	(2.31)
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Observations	87,504	87,504	87,504	38,532	38,532
Adj. R^2	0.126	0.832	0.832	0.831	0.831

This table examines the impact of corporate board reform on audit fees conditioning on auditor switch. PostReform is an indicator variable that is equal to one (zero) for years after (before) a country j undergoes a major board reform. SwitchUp is an indicator variable that is equal to one if a firm changes its auditor from non-Big N auditor in year $t-1$ to Big N auditor in year t. SwitchDown is an indicator variable that is equal to one if a firm changes its auditor from Big N auditor in year $t-1$ to non-Big N auditor in year t. The coefficients and t-values of control variables are included in regressions but omitted for brevity. Detailed definitions of variables are included in Appendix A. Numbers in parentheses are t-statistics calculated using standard errors clustered at the country level. ***, ** and * indicate a two-tailed test significance level at 1, 5 and 10%, respectively.

increasing demand after the reforms. To examine the impact of corporate board reforms on audit quality, we use the likelihood of filing a restatement to proxy the audit quality.

In Table 6, we show empirical results for our third hypothesis that examines how audit quality changes after board reforms. To construct the dependent variable, which equals one if a firm restates its financial statement in a given year and zero otherwise, we obtained restatement information from Worldscope. Since our dependent variable is an indicator variable, we use logit regression specifications. Column (1) shows a negative association between $PostReform_t$ and *Restatement*. Although statistically insignificant, we find clients with Big N auditors are less likely to file. Based on the staggered nature of the board reforms, we mitigate our concern of endogeneity bias by having both control and treatment groups at the same time. We also observe that firms with negative ROA, high leverage and a modified audit opinion are more likely to file restatements. In column (2), we include an interaction term, $PostReform_t \times BigN_t$, to capture how the likelihood of filing a restatement changes for the clients that are audited by Big N auditors after the board reform. We find a negative and statistically significant coefficient for the interaction term, which means that firms with Big N auditors are less likely to file restatement due to the higher audit quality after the country-level board reform.[19]

Overall, we find that firms are less likely to restate their financial statements in the postreform period, indicating auditors provide higher quality audits after reforms. Consistent with previous literature, we argue that boards demand high-quality audits and, consequently, audit quality increases after reforms (Srinivasan, 2005; Richardson, 2005; Street & Hermanson, 2019).

[19] Although we confirm that the area under the ROC curve is 0.8076 and McFadden's R-squared is 0.211, Hosmer–Lemeshow chi-squared statistics do not pass the goodness-of-fit tests. To alleviate this concern, we further test our regression results of restatements with a different model, such as a probit regression, and alternative difference-in-differences model based on the stacked sample. We also examined different sample periods by focusing on [−5, +5] around the board reform in each country. However, all alternative tests do not pass the goodness-of-fit test. Thus, we posit that the poor goodness-of-fit is not driven by the single regression specification, but driven by the nature of the restatement's asymmetric distribution (i.e., 96.4% of the restatements are concentrated in postreform period).

TABLE 6 Board reform and the likelihood of restatement

Variables	(1)	(2)
	Dependent variable: Restatement	
$PostReform_t$	−1.133**	−0.810
	(−2.52)	(−1.63)
$BigN_t$	−0.039	0.343***
	(−1.20)	(2.59)
$PostReform_t \times BigN_t$		−0.388***
		(−2.80)
$Ln(Assets)_t$	0.159***	0.159***
	(6.89)	(6.87)
$ForeignAssets_t$	−0.016	−0.014
	(−0.17)	(−0.15)
$Tangible_t$	−0.287***	−0.286***
	(−3.83)	(−3.81)
$QuickRatio_t$	−0.036***	−0.036***
	(−4.53)	(−4.54)
$InvRec_t$	0.017	0.017
	(0.18)	(0.18)
ROA_t	0.041***	0.041***
	(3.19)	(3.22)
$Loss_t$	0.144***	0.144***
	(2.58)	(2.59)
$Leverage_t$	0.121***	0.121***
	(3.59)	(3.59)
$Ln(\#Analysts)_t$	−0.012	−0.012
	(−0.47)	(−0.47)
$CrossList_t$	0.052	0.052
	(0.89)	(0.90)
$AuditorIndSpec_t$	0.005	0.005
	(0.17)	(0.16)
$AuditorTenure_t$	0.007***	0.007***
	(3.09)	(3.10)
$UnQualified_t$	0.041	0.041
	(0.67)	(0.66)
$IFRS_t$	−1.336***	−1.335***
	(−3.96)	(−3.96)
RuleLaw	−3.102**	−3.092**
	(−2.31)	(−2.29)
$Ln(GDP)_t$	−0.241	−0.238
	(−0.34)	(−0.34)

(Continues)

TABLE 6 (Continued)

Variables	(1)	(2)
	Dependent variable: Restatement	
$Inflation_t$	−0.040	−0.040
	(−0.77)	(−0.77)
Constant	−15.237***	−15.538
	(−3.25)	(−1.64)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Country FE	Yes	Yes
Observations	87,504	87,504
Pseudo R^2	0.211	0.211

This table examines the impact of corporate board reform on the likelihood of restatement. PostReform is an indicator variable that is equal to one (zero) for years after (before) a country *j* undergoes a major board reform. The dependent variable is Restatement, which equals one if a firm files a restatement and zero otherwise. The coefficients and *t*-values of control variables are based on the logit regression specification. Detailed definitions of variables are included in Appendix A. Numbers in parentheses are *t*-statistics calculated using standard errors clustered at the country level. ***, ** and * indicate a two-tailed test significance level at 1, 5 and 10%, respectively.

4.4 | Board reform and transparency

Next, we investigate second potential channels that may illustrate how audit fees increase following a corporate board reform: improved information transparency. First, we test whether analyst forecast accuracy is improved after board reforms are enforced. As we discussed earlier, we use analyst forecast accuracy as a proxy for a firm's information quality based on the information users. Analyst forecast accuracy is measured as the absolute value of a forecast consensus value minus actual EPS scaled by the previous period's price multiplied by a negative one (Byard et al., 2006). Second, we test how management voluntary disclosure characteristics change after the board reform. We use management forecast frequency to proxy the information quality based on the information producers. Management forecasts include capital expenditure, dividends, EBITDA, EPS, gross margin, profit, ROA and sales. We obtain international analyst forecast information from I/B/E/S Academics and management forecast from I/B/E/S Guidance.[20]

Table 7 shows the empirical analysis of our fourth hypothesis. In this test, in addition to auditor-related control variables, we also include analyst-related control variables such as volatility of EPS, forecast dispersion, forecast horizon and absolute changes of EPS (Byard et al., 2006; Duru & Reeb, 2002). In column (1), the coefficient of PostReform is positive and significant at the 5% level. The impact of board reforms on analyst forecast accuracy is not only statistically significant but also economically significant. The magnitude of the coefficient is 0.015, and the absolute value of average analyst accuracy is 0.044. Thus, the EPS consensus estimate is improved by 34% (0.015/0.044) after the county-level board reforms. In column (2), we find that its impact is concentrated in the firms that are audited by Big N auditors with similar economic magnitude. In columns (3) and (4), we present regression results on how information producers change their disclosure decision after the board reform. After the board reform, managers increase the frequency of voluntary forecasts by 17.5%, and its impact is also concentrated in firms that are audited by the Big N auditors.

Similar to the previous literature, our results show that analysts increase their forecast accuracy and managers increase voluntary forecasts after corporate board reforms due to improved governance effectiveness. Country-level board reforms increase the portion of independent directors and the establishment of audit committees, which

[20] Our sample size decreases to 33,347 due to the merge of the Worldscope dataset and the I/B/E/S dataset.

TABLE 7 Board reform and transparency

	(1)	(2)	(3)	(4)
Variables	**Dependent variable: AnalystAccuracy**		**ManagementFrequency**	
$PostReform_t$	0.015**	0.005	0.175**	−0.147
	(2.29)	(0.56)	(2.69)	(−0.75)
$BigN_t$	0.005	−0.007	0.083	−0.272
	(1.55)	(−1.23)	(1.32)	(−1.37)
$PostReform_t \times BigN_t$		0.014*		0.388**
		(2.03)		(2.22)
$Ln(Assets)_t$	−0.010*	−0.010*	0.069***	0.067***
	(−1.87)	(−1.89)	(13.11)	(14.69)
$ForeignAssets_t$	−0.013	−0.013	−0.096***	−0.095***
	(−1.22)	(−1.21)	(−2.95)	(−2.89)
$Tangible_t$	0.016	0.016	−0.454***	−0.453***
	(0.73)	(0.73)	(−5.36)	(−5.32)
$QuickRatio_t$	0.003	0.003	−0.045***	−0.045***
	(1.27)	(1.27)	(−8.67)	(−8.37)
$InvRec_t$	−0.040	−0.040	−0.213*	−0.205*
	(−1.40)	(−1.40)	(−1.76)	(−1.75)
ROA_t	0.154***	0.154***	0.307***	0.306***
	(5.01)	(5.01)	(13.42)	(12.91)
$Loss_t$	−0.031**	−0.031**	−0.122***	−0.121***
	(−2.31)	(−2.30)	(−5.04)	(−5.28)
$Leverage_t$	−0.084***	−0.085***	−0.065**	−0.066**
	(−5.36)	(−5.38)	(−2.26)	(−2.25)
$Ln(\#Analysts)_t$	0.044***	0.044***	0.285***	0.287***
	(3.05)	(3.05)	(3.85)	(3.94)
$CrossList_t$	−0.023	−0.023	−0.121	−0.119
	(−1.18)	(−1.18)	(−1.45)	(−1.43)
EPS_Vol_t	−0.001	−0.001	0.006**	0.006**
	(−1.19)	(−1.19)	(2.15)	(2.24)
$Disp_t$	−0.244*	−0.244*	0.016	0.019
	(−1.78)	(−1.78)	(0.42)	(0.49)
$Horiz_t$	−0.000	−0.000	−0.001***	−0.001***
	(−0.72)	(−0.72)	(−6.11)	(−6.36)
$\lvert\Delta EPS\rvert_t$	−0.000	−0.000	−0.000	−0.000
	(−0.75)	(−0.75)	(−1.33)	(−1.28)
$IFRS_t$	0.002	0.002	−0.319***	−0.311***
	(0.20)	(0.20)	(−3.37)	(−3.88)
RuleLaw	0.171**	0.169*	−0.599	−0.647*
	(2.09)	(2.07)	(−1.70)	(−1.95)

(Continues)

TABLE 7 (Continued)

Variables	(1)	(2)	(3)	(4)
	Dependent variable: AnalystAccuracy		ManagementFrequency	
$Ln(GDP)_t$	0.099**	0.104**	−0.906**	−0.781**
	(2.36)	(2.53)	(−2.68)	(−2.36)
$Inflation_t$	−0.001	−0.001	0.113*	0.110*
	(−0.20)	(−0.22)	(1.98)	(1.89)
Constant	−0.584**	−0.593**	3.580**	3.517**
	(−2.56)	(−2.62)	(2.42)	(2.52)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	33,346	33,346	20,731	20,731
Adj. R^2	0.537	0.537	0.468	0.469

This table examines the impact of corporate board reform on analyst forecast accuracy and management forecast frequency. Analyst forecast accuracy is defined as the absolute difference between forecast consensus value and actual value multiplied by negative one, scaled by the stock price (Byard et al., 2006). Management forecast frequency is the log-transformed total number of forecasts, including capital expenditure, dividends, EBITDA, EPS, gross margin, profit, ROA and sales, made by the managers in a given year. For control variables, we added analyst-related control variables, such as EPS volatility (Byard et al., 2006), forecast dispersion (Byard et al., 2006), forecast horizon (Byard et al., 2006) and the absolute value of the change in earnings per share from the prior year to the current year (Duru & Reeb, 2002). Detailed definitions of variables are included in Appendix A. Numbers in parentheses are *t*-statistics calculated using standard errors clustered at the country level. ***, ** and * indicate a two-tailed test significance level at 1, 5 and 10%, respectively.

improves corporate governance quality as well as firm information transparency. Combining evidence from previous analyses, we provide evidence that board reforms increase information production and information transparency to outsiders, including auditors and financial analysts.

4.5 | Impact of country-level characteristics on audit fees

Besides the impact of different types and components of board reforms on audit fees, we examine the monitoring role of country-level characteristics on the association between board reforms and audit fees. To test the country-level characteristics, PostReform is interacted with various country-specific variables, Emerging, Civillaw, LowPolstab, LowRegqual and LowGoveffect, in Table 8. In panel A, we show the correlation matrix for country-level characteristics and find these variables are highly correlated with each other. Thus, we run separate regressions to examine how country-level characteristics moderate the impact of board reform on audit fees.

In panel B, column (1) shows the impact of board reforms in emerging markets on audit fees, column (2) in countries with a civil law regime, column (3) in countries with different levels to implement corporate governance policies, column (4) in countries with different perceptions of the ability of the government to formulate and implement policies and regulations and column (5) in countries with different perceptions of politically motivated instability including terrorism. Column (6) includes all five institutional characteristics from (1) to (5) together to mitigate potential omitted variable bias.

Overall, we find no significant difference between emerging versus developed and civil-law versus common-law countries regarding the impact of board reforms on audit fees. Instead, column (3) shows an increase of 20.6% in audit fees for firms located in countries with poor corporate governance. Similarly, countries with a lower perception of

TABLE 8 Country-level characteristics

Panel A. Correlation matrix					
	(1)	(2)	(3)	(4)	(5)
(1) Emerging	1				
(2) CivilLaw	−0.16***	1			
(3) LowGoveffet	0.72***	0.32***	1		
(4) LowRegqual	0.70***	0.38***	0.90***	1	
(5) LowPolstab	0.58***	−0.18***	0.41***	0.35***	1

Panel B. Regression results						
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**Dependent variable: Ln(AuditFee)$_t$**					
PostReform$_t$	0.124*	0.146**	0.099	0.101	0.053	−0.010
	(1.93)	(2.46)	(1.49)	(1.54)	(0.97)	(−0.17)
Emerging	–					–
PostReform$_t$ × Emerging	0.268**					−0.103
	(2.46)					(−0.78)
CivilLaw		–				–
PostReform$_t$ × Civillaw		0.101				0.143
		(0.56)				(0.81)
LowGoveffet			−0.200**			−0.137***
			(−2.62)			(−2.98)
PostReform$_t$ × LowGoveffect			0.206**			0.037
			(2.28)			(0.41)
LowRegqual				−0.159**		−0.074
				(−2.31)		(−1.02)
PostReform$_t$ × LowRegqual				0.236**		0.128
				(2.16)		(1.34)
LowPolstab					−0.298***	−0.319***
					(−5.88)	(−9.51)
PostReform$_t$ × LowPolstab					0.291***	0.324***
					(2.92)	(3.20)
Constant	1.352	1.021	1.449	1.421	1.486	1.736
	(1.04)	(0.78)	(1.15)	(1.12)	(1.20)	(1.38)
Variance inflation factor	9.16	8.36	9.61	9.39	8.94	13.35
Condition number (Belsley et al.)	32.79	29.64	30.51	29.86	30.96	40.24
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes

(Continues)

TABLE 8 (Continued)

Panel B. Regression results						
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	Dependent variable: Ln(AuditFee)$_t$					
Observations	87,504	87,504	87,504	87,504	87,504	87,504
Adj. R^2	0.836	0.835	0.836	0.836	0.836	0.836

This table reports the impact of country-level characteristics on audit fees. Emerging is an indicator that equals one if the home country is classified as one of the emerging markets and zero otherwise. Civillaw is an indicator variable that equals one for countries with a Civil-law legal system and zero otherwise. LowGoveffect is an indicator that is equal to one (zero) if a country's Goveffect is less (or greater) than the median value of Goveffect. LowPolstab is an indicator that is equal to one (zero) if a country's Polstab is less (or greater) than the median value of Polstab. The coefficients and *t*-values of control variables are included in regressions but omitted for brevity. Detailed definitions of variables are included in Appendix A. Numbers in parentheses are *t*-statistics calculated using standard errors clustered at the country level. ***, ** and * indicate a two-tailed test significance level at 1, 5 and 10%, respectively.

the ability of governments to implement regulations have 23.6% higher audit fees in column (4). Last, countries with a higher degree of perception of political instability show higher audit fees by 29.1% in column (5). Therefore, board reforms in countries with lower corporate governance quality, weak enforcement actions of regulations and higher political instability increase audit fees. When we include all five country characteristics in one regression in column (6), we find that perception of regulatory quality and political instability dominates the other characteristics.[21]

This can be partially explained by the notion that auditors charge a higher price due to lower shareholder protection and higher information asymmetry in the countries with weak governance, measured by emerging markets, weak corporate governance and the enforcement level of governmental policies (La Porta et al., 1997, 1998). This is also consistent with the theory of information acquisition costs (Duchin et al., 2010; Harris & Raviv, 2008; Raheja, 2005; Zhang & Yu, 2016).

4.6 | Sensitivity analysis

Although our empirical results are robust across various regression models, such as OLS, dynamic regressions and different time period, we perform a variety of additional analyses, including different fixed effects, shorter sample periods, different samplings and an alternative dependent variable in Table 9 and stacked regressions of audit fees in Table 10.

The first sensitivity test in Table 9 uses samples prior to 2006 to mitigate the impact of the 2008 global financial crisis. Next, we replace the dependent variable with a change in audit fee and retest our baseline regression in column (2). We further exclude US firms from the sample to make sure that our main results are not driven by one single country with the largest samples or by SOX in column (3). In column (4), we focus on the sample period, [−1, +1] around the board reform. Last, we drop nonboard reform countries in column (5). Similar to the results reported earlier, all robustness tests are conducted using both industry, country and year fixed effects. Taken together, all sensitivity test results with industry, country and year fixed effects show that board reforms increased audit fees by around 10% in the year following board reforms. Overall, we provide consistent results using various additional analyses and alternative measures.

[21] Readers should be careful about the interpretation of the results in column (6) due to the potential multicollinearity among the explanatory variables. Based on the condition number, column (6) presents the value higher than 40, which is the rule of thumb to determine the potential multicollinearity (Belsley et al. 1980).

TABLE 9 Sensitivity analysis

	(1) Before 2006	(2) ΔIn(Audit Fees)	(3) Without US firms	(4) [−1, +1]	(5) Without nonreform countries
$PostReform_t$	0.102*	0.532**	0.116*	0.716***	0.155**
	(2.01)	(2.67)	(1.71)	(11.15)	(2.64)
Controls	Yes	Yes	Yes	Yes	Yes
FE	Industry	Industry	Industry	Industry	Industry
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	40,034	44,908	58,675	11,224	86,626
Adj. R^2	0.834	0.247	0.815	0.818	0.835

This table reports estimates from alternative regressions where the dependent variable is the audit fee. Column (1) uses samples prior to 2006. Column (2) uses changes in audit fees as an alternative dependent variable. Column (3) excludes the US Column (4) uses a sample period of [−1, +1] around board reform. Column (5) drops nonreform countries. Detailed definitions of variables are included in Appendix A. ***, ** and * indicate a two-tailed test significance level at 1, 5 and 10%, respectively.

A recent stream of literature highlights that a potential bias occurs in the staggered difference-in-differences (DiD) estimators (Baker et al., 2022; Barrios, 2021). They argue that heterogenous treatment effect for the different firms across the different time period may bias the DiD estimators. To alleviate such a concern, Baker et al. (2022) suggest several alternative approaches, including the stacked regression estimator.[22]

Following Baker et al. (2022), we demonstrate robustness of our empirical results, utilizing the stacked regression estimators. First, we create a "clean 2 × 2" dataset to estimate traditional difference-in-differences estimators. Each country, which went through the board reform in our sample period, is paired up with countries that did not go through the board reform. In each dataset, we create Treat and Post variables. Treat is equal to one if a firm belongs to the countries that ever experience board reform and zero otherwise. Post is equal to one if a firm-year observation is after the treated country's board reform year. By creating these variables, our variable of interest in the traditional difference-in-differences is Post × Treat. The independent Treat variable is omitted in the regression specification due to the country fixed effect.

In Table 10, we present empirical results using stacked regressions of audit fees. Column (1) includes the entire stacked regression sample. Columns (2) and (3) focus on the sample periods to [−5, +5] and [−3, +3] around board reforms, respectively. All three columns present strong results. Our variable of coefficient, Post × Treat, is positive and statistically significant at the 1% level regardless of the sample. Furthermore, other control variables also show consistent results with those of staggered DiD specification. It further confirms our empirical analysis and mitigates the potential concern that stems from the staggered DiD specification.

5 | CONCLUSION

One of the potential benefits of board reforms is to improve the process by which auditors are selected, retained and compensated. That raises an interesting question to accounting researchers and practitioners. To the best of our knowledge, this study is the first to test the association between board reforms and audit fees in a global setting. Due to different types and components of board reforms as well as country-level characteristics, prior studies provide mixed evidence as to whether such potential benefits of board reforms are being achieved. This study provides a comprehensive empirical analysis of the relation between a board reform's efficacy and audit pricing decisions.

[22] We appreciate the comments from the Editor that the potential bias occurs when using a staggered DiD methodology.

TABLE 10 Stacked regression of audit fee

Variables	(1) Stacked sample	(2) [−5, +5]	(3) [−3, +3]
Post	−0.096*	−0.130	−0.067
	(−1.74)	(−1.48)	(−1.29)
Post × Treat	0.276***	0.290***	0.206***
	(3.59)	(3.61)	(3.32)
$Ln(Assets)_t$	0.538***	0.562***	0.567***
	(37.38)	(44.20)	(45.74)
$ForeignAssets_t$	0.512***	0.588***	0.583***
	(8.73)	(8.20)	(6.15)
$Tangible_t$	−0.665***	−0.720***	−0.731***
	(−5.26)	(−5.42)	(−5.24)
$QuickRatio_t$	−0.032***	−0.036***	−0.038***
	(−5.41)	(−4.57)	(−4.49)
$InvRec_t$	0.248***	0.250***	0.264***
	(3.42)	(3.33)	(3.93)
ROA_t	−0.151***	−0.147***	−0.139***
	(−6.34)	(−8.04)	(−8.49)
$Loss_t$	0.155***	0.168***	0.168***
	(16.35)	(10.32)	(11.23)
$Leverage_t$	0.110***	0.100***	0.111***
	(3.34)	(4.15)	(6.27)
$Ln(\#Analysts)_t$	0.061***	0.043***	0.038**
	(3.52)	(3.02)	(2.44)
$CrossList_t$	0.292***	0.365***	0.370***
	(4.21)	(4.29)	(3.93)
$BigN_t$	0.284***	0.215***	0.214***
	(6.05)	(5.91)	(5.95)
$AuditorIndSpec_t$	0.291***	0.271***	0.257***
	(11.60)	(10.58)	(9.26)
$UnQualified_t$	−0.006*	−0.005**	−0.003**
	(−1.71)	(−2.18)	(−2.31)
$AuditorTenure_t$	−0.051	−0.060	−0.081*
	(−1.62)	(−1.46)	(−1.90)
$IFRS_t$	−0.000	−0.025	−0.019
	(−0.00)	(−0.31)	(−0.22)
RuleLaw	−0.221	−0.518	−0.584
	(−1.56)	(−1.35)	(−1.39)
$Ln(GDP)_t$	0.283	0.065	0.617
	(1.45)	(0.16)	(1.13)

(Continues)

TABLE 10 (Continued)

Variables	(1) Stacked sample	(2) [−5, +5]	(3) [−3, +3]
$Inflation_t$	−0.027**	−0.048**	0.004
	(−2.31)	(−2.25)	(0.14)
Constant	1.195	2.364	0.355
	(1.12)	(1.29)	(0.15)
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Observations	112,088	55,927	36,701
Pseudo R^2	0.839	0.841	0.831

This table reports regression results of audit fees based on the stacked regression specification by following Baker et al. (2022). To create a stacked dataset, each country, which went through the board reform in our sample period, is paired up with countries that did not go through the board reform. In each dataset, Treat and Post variables are created. *Treat* is equal to one if a firm belongs to the countries that ever experience board reform and zero otherwise. Post is equal to one if a firm-year observation is after the treated country's board reform year. By creating these variables, the variable of interest in the traditional difference-in-differences is Post × Treat. Column (1) includes the entire stacked sample. Column (2) limits the samples to [−5, +5] around the board reform year. Last, column (3) focuses on the samples to [−3, +3] around the board reform year. Detailed definitions of variables are included in Appendix A. Numbers in parentheses are *t*-statistics calculated using standard errors clustered at the country level. ***, ** and * indicate a two-tailed test significance level at 1, 5 and 10%, respectively.

In this study, we investigate the impact of worldwide board reforms on audit fees through the supply- and demand-side of audit pricing decisions. More importantly, following dynamic regression models in Bertrand & Mullainathan (2003), we mitigate endogenous relations between board reforms and audit fees. We find audit fees increase significantly 1 year after major board reforms and afterward using different fixed effects (firm and year fixed effects and country, industry and year fixed effects). We argue that an increase in audit fees is due to the supply- and demand-side of audit pricing decisions. Managers change from non-Big N auditors to Big N auditors in response to the corporate board reform, which also reduces the likelihood of filing restatements. We also find that both analyst forecast accuracy and management forecast frequency increase after the reform, which shows end-users, such as analysts and auditors, may have better access to the firm-specific information due to more information production. An increase in audit fees is mainly due to firms changing their auditors to the Big N, which represents an increase in demand for better audit quality. In addition, we find auditors charge higher audit fees to the countries with poor governance effectiveness, with weak regulation quality and with lower political stability. Thus, we find audit pricing decisions are associated with various country-level characteristics. Last, we perform a variety of robustness analyses using alternative sample periods and measures, different samplings, stacked regressions and so on. The results remain quantitatively and qualitatively the same as our main findings, consistent with the view that improved board characteristics increase the demand for and supply of audit effort to protect the reputation and to avoid future legal liability, which results in higher audit fees, as well as audit quality.

Collectively, the findings of this study improve our understanding of the efficacy of board composition and structure in a global setting. Moreover, incorporating multiple timings of board reforms in each country as an exogenous shock to individual firms provides us a natural setting, which mitigates the endogeneity concern and self-selection issues. In addition, this study further provides worldwide evidence by exploring the role of various country-level characteristics in audit pricing decisions. Overall, our study contributes to the literature by underscoring the critical role that worldwide board reforms play in audit pricing decisions through a better information environment.

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DATA AVAILABILITY STATEMENT

None

REFERENCES

Abbott, L., Parker, S., Peters, G. F., & Raghunandan, K. (2003). The Association between audit committee characteristics and audit fees. *Auditing: A Journal of Practice & Theory*, *22*(2), 17–32.

Adkins, L. C., Waters, M. S., & Hill, R. C. (2015). Collinearity diagnostics in gretl. Economics Working Paper Series 1506, Oklahoma State University, Department of Economics and Legal Studies in Business. https://ideas.repec.org/p/okl/wpaper/1506.html

Ahmed, A., & Duellman, S. (2007). Accounting conservatism and board of director characteristics: An empirical analysis. *Journal of Accounting and Economics*, *43*(2–3), 411–437.

Armstrong, C. S., Core, J. E., & Guay, W. R. (2014). Do independent directors cause improvements in firm transparency? *Journal of Financial Economics*, *113*(3), 383–403.

Audousset-Coulier, S., Cazavan-Jeny, A., & Song, B. (2011). Abnormal audit fees and properties of analyst forecast, the role of cross-listing and legal origin. Working Paper.

Baker, A. C., Larcker, D. F., & Wang, C. C. Y. (2022). How much should we trust staggered difference-in-differences estimates? *Journal of Financial Economics*, *144*(2), 370–395.

Barrios, J. M. (2021). Staggeringly problematic: A primer on staggered DiD for accounting researchers. Working Paper.

Becker, C. L., Defond, M. L., Jiambalvo, J., & Subramanyam, K. R. (1998). The effect of audit quality on earnings management. *Contemporary Accounting Research*, *15*(1), 1–24.

Belsley, D. A., Kuh, E., & Welsch, R. E.. (1980). *Regression diagnostics: Identifying influential data and sources of collinearity*. John Wiley & Sons, Inc.

Baliga, B., Moyer, R., & Rao, R. (1996). CEO duality and firm performance: What's the fuss? Strategic Management Journal, 17(1), 41-53.

Bertrand, M., & Mullainathan, S. (2003). Enjoying the quiet life? Corporate governance and managerial preferences. *Journal of Political Economy*, *111*(5), 1043–1075.

Bills, K. L., Jeter, D. C., & Stein, S. E. (2014). Auditor industry specialization and evidence of cost efficiencies in homogenous industries. *The Accounting Review*, *90*(5), 1721–1754.

Byard, D., Li, Y., & Weintrop, J. (2006). Corporate governance and the quality of financial analysts' information. *Journal of Accounting and Public Policy*, *25*, 609–625.

Bushman, R., Piotroski, J., & Smith, A. (2005). Insider trading restrictions and analysts' incentives to follow firms. *Journal of Finance*, *60*(1), 35–66.

Carcello, J. V., Hermanson, D., Neal, T., & Riley, R. (2002). Board characteristics and audit fees. *Contemporary Accounting Research*, *19*(3), 365–84.

Chen, X., Cheng, Q., & Wang, X. (2015). Does increase board independence reduce earnings management? Evidence from recent regulatory reforms. *Review of Accounting Studies*, *20*(2), 899–933.

Choi, J., Kim, J., Liu, X., & Simunic, D. (2008). Audit pricing, legal liability regimes, and big 4 premiums: Theory and cross-country evidence. *Contemporary Accounting Research*, *25*(1), 55–99.

Choi, J., Kim, J., Liu, X., & Simunic, D. (2009). Cross-listing audit fee premiums: Theory and evidence. *The Accounting Review*, *84*(5), 1429–1463.

Christensen, B., Glover, S., Omer, T., & Shelley, M. (2016). Understanding audit quality: insights from audit professionals and investors. *Contemporary Accounting Research*, *33*(4), 1648–1684.

Cohen, J. R., Hoitash, U., Krishnamoorthy, G., & Wright, A. (2014). The effect of audit committee industry expertise on monitoring the financial reporting process. *The Accounting Review*, *89*(1), 243–273.

Dahya, J., & McConnell, J. J. (2007). Board composition, corporate performance, and the Cadbury Committee recommendation. *Journal of Financial and Quantitative Analysis*, *42*, 535–564.

DeFond, M., & Zhang, J. (2014). A review of archival auditing research. *Journal of Accounting and Economics*, *58*(2-3), 275–326.

Dhaliwal, D. S., Naiker, V., & Navissi, F. (2010). The association between accruals quality and the characteristics of accounting experts and mix of expertise on audit committees. *Contemporary Accounting Research*, *27*(3), 787–827.

Duchin, R., Matsusaka, J., & Ozbas, O. (2010). When are outside directors effective? *Journal of Financial Economics*, *96*(2), 195–215.

Duru, A., & Reeb, D. M. (2002). International diversification and analysts' forecast accuracy and bias. *The Accounting Review*, *77*(2), 415–433.

Elder, R., Zhang, Y., Zhou, J., & Zhou, N. (2012). Internal control weaknesses and client risk management. *Journal of Accounting, Auditing, and Finance*, *24*(4), 543–579.

Ettredge, M., Li, C., & Scholz, S. (2007). Audit fees and auditor dismissals in the Sarbanes-Oxley Era. *Accounting Horizons*, *21*(4), 371–386.

Fauver, L., Hung, M., Li, X., & Taboada, A. (2017). Board reforms and firm value: Worldwide evidence. *Journal of Financial Economics*, *125*(1), 120–142.

Ferreira, D., Ferreira, M. A., & Raposo, C. C. (2011). Board structure and price informativeness. *Journal of Financial Economics*, *99*(3), 523–545.

Francis, J. R. (2004). What do we know about audit quality? *The British Accounting Review*, *36*, 345–368.

Francis, J. R. (2011). A Framework for understanding and researching audit quality. *Auditing: A Journal of Practice & Theory*, *30*(2), 125–152.

Francis, J., Lafond, R., Olsson, P., & Schipper, K. (2005). The market pricing of accruals quality. *Journal of Accounting and Economics*, *39*(2), 295–327.

Francis, J., & Wang, D. (2008). The joint effect of investor protection and big 4 audits on earnings quality around the world. *Contemporary Accounting Research*, *25*(1), 157–91.

Francis, J., & Yu, M. (2009). The effect of big four office size on audit quality. *The Accounting Review*, *84*(5), 1521–1552.

Fung, S., Gul, F., & Krishnan, J. (2012). City-level auditor industry specialization, economies of scale, and audit pricing. *The Accounting Review*, *87*(4), 1281–1307.

Ghosh, A., & Pawlewicz, R. (2009). The impact of regulation on auditor fees: Evidence from the Sarbanes-Oxley Act. *Journal of Accounting Research*, *28*(2), 171–197.

Gotti, G., Han, S., Higgs, J. L., & Kang, T. (2012). Managerial ownership, analyst coverage, and audit fee. *Journal of Accounting, Auditing, and Finance*, *27*(3), 412–437.

Gow, I. D., Larcker, D., & Reiss, P. C. (2016). Causal inference in accounting research. *Journal of Accounting Research*, *51*(2), 477–523.

Griffin, P. A., Lont, D., & Sun, Y. (2008). Corporate governance and audit fees: Evidence of countervailing relations. *Contemporary Accounting Research*, *4*(1), 18–49.

Halperin, R., & Lai, K. (2014). The relation between auditor-provided tax services fees and audit fees after the Sarbanes-Oxley Act: From the perspective of cross-selling of services. *Journal of Accounting, Auditing, and Finance*, *30*(3), 341–372.

Hay, D., Knechel, W. R., & Wong, N. (2006). Audit fees: A meta-analysis of the effect of supply and demand attributes. *Contemporary of Accounting Research*, *23*, 141–191.

Harris, M., & Raviv, A. (2008). A theory of board control and size. *Review of Financial Studies*, *21*, 1797–1832.

Hermalin, B., & Weisbach, M. (2003). Boards of directors as an endogenously determined institution: A survey of the economic literature, *FRBNY Economic Policy Review*, *9*, 7–26.

Hines, C., Masli, A., Mauldin, E. G., & Peters, G. F. (2015). Board risk committees and audit pricing. *Auditing: A Journal of Practice & Theory*, *34*(5), 59–84.

Hoitash, R., Hoitash, U., & Bedard, J. C. (2008). Internal control quality and audit pricing under the Sarbanes-Oxley act. *Auditing: A Journal of Practice & Theory*, *27*(1), 105–126.

Hribar, P., & Jenkins, N. (2004). The effect of accounting restatements on earnings revisions and the estimated cost of capital. *Review of Accounting Studies*, *9*(2-3), 337–356.

Hribar, P., Kravet, T., & Wilson, R. (2014). A new measure of accounting quality. *Review of Financial Studies*, *19*(1), 506–538.

Hsu, C., Li, X., Ma, Z., & Phillips, G. (2017). Does product market competition influence analyst coverage and analyst career success? Working Paper.

Hu, J., Li, S., Taboada, A. G., & Zhang, F. (2020). Corporate board reforms around the world and stock price crash risk. *Journal of Corporate Finance*, *62*, 101557.

Huang, H. W., Raghunandan, K., & Rama, D. (2009). Audit fees for initial audit engagements before and after SOX. *Auditing: A Journal of Practice & Theory*, *28*(1), 171–190.

Jha, A., & Chen, Y. (2015). Audit fees and social capital. *The Accounting Review*, *90*(2), 611–639.

Karim, K., Robin, A., & Suh, S. (2015). Board structure and audit committee monitoring: Effects of audit committee monitoring incentives and board entrenchment on audit fees. *Journal of Accounting, Auditing, and Finance*, *31*(2), 249–276.

Kim, J. B., Liu, X., & Zheng, L. (2012). The impact of mandatory IFRS adoption on audit fees: Theory and evidence. *The Accounting Review*, *87*(6), 2061–2094.

Kim, E. H., & Lu, Y. (2013). Corporate governance reforms around the world and cross-border acquisitions. *Journal of Corporate Finance*, *22*, 236–253.

Klasa, S., Ortiz-Molina, H., Serfling, M., & Srinivasan, S. (2017). Protection of trade secrets and capital structure decisions. *Journal of Financial Economics*, forthcoming.

Klein, A. (2002). Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, *33*(3), 375–400.
Knechel, W. R., Krishnan, G., Pevzer, M., Shefchik, L., & Velury, U. (2013). Audit quality: Insights from the academic literature. *Auditing: A Journal of Practice & Theory*, *32*(1), 385–421.
Krishnan, G. V., & Visvanathan, G. (2009). Do auditors price audit committee's expertise? The case of accounting versus nonaccounting financial experts. *Journal of Accounting, Auditing and Finance*, *24*(1), 115–144.
Lang, M., & Lundholm, R. (1996). Corporate disclosure policy and analyst behavior. *The Accounting Review*, *71*(4), 467–492.
La Porta, R., Lopez-de-Silances, F., Shleifer, A., & Vishny, R. (1997). Legal determinants of external finance. *Journal of Finance*, *52*, 1131–1150.
La Porta, R., Lopez-de-Silances, F., Shleifer, A., & Vishny, R. (1998). Law and finance. *Journal of Political Economy*, *106*, 1113–1155.
O'Sullivan, N. (1999). Board characteristics and audit pricing post-Cadbury: a research note. *European Accounting Review*, *8*(2), 253–263.
Palmrose, Z. (1986). Audit fees and auditor size: Further evidence. *Journal of Accounting Research*, *24*(1), 97–110.
Palmrose, Z., Richardson, V., & Scholz, S. (2004). Determinants of market reactions to restatement announcements. *Journal of Accounting and Economics*, *37*(1), 59–89.
Petra, S. (2007). The effects of corporate governance on the informativeness of earnings. *Economics of Governance*, *8*(2), 129–152.
Pratt, J., & Stice, J. D. (1994). The effects of client characteristics on auditor litigation risk judgements, required audit evidence, and recommended audit fees. *The Accounting Review*, *69*, 639–656.
Raheja, C. G. (2005). Determinants of board size and composition: A theory of corporate boards. *Journal of Financial & Quantitative Analysis*, *40*, 283–306.
Reichelt, K., & Wang, D. (2010). National and office-specific measures of auditor industry expertise and effects on audit quality. *Journal of Accounting Research*, *48*(3), 647–686.
Richardson, S. A. (2005). Discussion of "Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members." *Journal of Accounting Research*, *43*(2), 335–342.
Seetharaman, A., Gul, F., & Lynn, S. (2002). Litigation risk and audit fees: Evidence from UK firms cross-listed on US markets. *Journal of Accounting and Economics*, *33*(1), 91–115.
Simintzi, E., Vig, V., & Volpin, P. (2014). Labor protection and leverage. *Review of Financial Studies*, *28*(2), 561–591.
Srinivasan, S. (2005). Consequences of financial reporting failure for outside directors: Evidence from accounting restatements and audit committee members. *Journal of Accounting Research*, *43*(2), 291–334.
Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. *Journal of Accounting Research*, *18*(1), 161–190.
Simunic, D. A., & Stein, M. (1996). Impact of litigation risk on audit pricing: A review of the economics and the evidence. *Auditing: A Journal of Practice & Theory*, *15*, 119–134.
Street, D., & Hermanson, D. R. (2019). How do restatements affect outside directors and boards? A review of the literature. *Journal of Accounting Literature*, Forthcoming.
Tsui, J., Jaggi, B., & Gul, F. (2001). CEO domination, discretionary accruals and audit fees. *Journal of Accounting, Auditing and Finance*, *16*, 189–207.
Wintoki, M. B., Linck, J., & Netter, J. (2012). Endogeneity and the dynamics of internal corporate governance. *Journal of Financial Economics*, *105*, 581–606.
Zhao, Y., & Chen, K. H. (2008). Staggered boards and earnings management. *The Accounting Review*, *83*(5), 1347–1381.
Zhang, Z., & Yu, Y. (2016). Does board independence affect audit fees? Evidence from recent regulatory reforms. *European Accounting Review*, *25*(4), 793–814.

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APPENDIX A

Variable definitions

Variable	Definition
Dependent variables	
AuditFee (US $ million)	US dollar value of audit fee [WorldScope]
Ln(AuditFee)	Log-transformed value of audit fee [WorldScope]
Restatement	An indicator variable that is equal to one if a firm files a restatement, zero otherwise [Worldscope]
AnalystAccuracy	A measure of analyst forecast accuracy, calculated as follows: $-1 \times$ (|Mean Forecast − Actual EPS|/Stock Price) [I/B/E/S Academics, Byard et al., 2006]
ManagementFrequency	A measure of management forecast (capital expenditure, dividends, EBITDA, EPS, gross margin, profit, ROA and sales) frequency, calculated as follows: log(1+number of annual management forecasts) [I/B/E/S Guidance]
Independent test variables	
PostReform	An indicator variable that is equal to one (zero) for years after (before) a country j undergoes a major board reform [Fauver et al., 2017]
SwitchUp	An indicator variable that is equal to one if a firm changes its auditor from non-Big N auditor in year $t-1$ to Big N auditor in year t.
SwitchDown	An indicator variable that is equal to one if a firm changes its auditor from Big N auditor in year $t-1$ to non-Big N auditor in year t.
Treat	An indicator variable that is equal to one if a firm belongs to the countries that ever experience board reform and zero otherwise.
Post	An indicator variable that is equal to one if a firm-year observation is after the treated country's board reform year.
Audit and client firm characteristics	
Assets (US $ million)	The book value of total assets demotivated in the US dollar [WorldScope]
Ln(Assets)	Log-transformed value of total assets demotivated in the US dollar [WorldScope]
ForeignAssets	Foreign assets scaled by assets [WorldScope]
Tangible	Property, plant and equipment scaled by total assets [WorldScope]
QuickRatio	Ratio of current assets to current liabilities [WorldScope]
InvRec	Sum of inventory and accounts receivable scaled by total assets [WorldScope]
ROA	Income before extraordinary items scaled by asset [WorldScope]
Loss	An indicator that is equal to one if ROA is less than 0, zero otherwise [WorldScope]
Leverage	The debt ratio, debts scaled by assets [WorldScope]
#Analysts	The number of analysts following in a given year [I/B/E/S]
Ln(#Analysts)	Log-transformed value of # Analysts [I/B/E/S]
AuditorRep	An auditor's market share in a given year and country [WorldScope]
AuditorIndSpec	An indicator variable that is equal to one if an auditor's market share in a given industry, year and country is greater than 33% and zero otherwise [WorldScope]
BigN	An indicator variable that is equal to one if an auditor is a Big N auditor [Compustat Global]

(Continues)

Variable	Definition
UnQualified	An indicator variable that equals 1 if a firm received an unqualified opinion for its financial statement [WorldScope]
Analyst level characteristics	
EPS_Vol	The standard deviation of earnings (IBES actual EPS) over the prior 5 years, scaled by the stock price at the start of the fiscal year [Byard et al., 2006]
Disp	The standard deviation of analysts' forecasts, scaled by the stock price at the start of the fiscal year [Byardet al., 2006]
Horiz	The number of days between the date of the consensus analyst forecast and the eventual earnings announcement date [Byard et al., 2006]
|ΔEPS|	The absolute value of change in EPS from the prior year [Duru & Reeb, 2002]
Country level characteristics	
CrossList	An indicator variable that equals 1 if a firm cross-lists on one or more foreign exchanges in a given year [http://sergei-sarkissian.com/data.html]
IFRS	An indicator variable that equals 1 if a firm's financial statement is followed by the accounting standard developed by the International Accounting Standards Board [WorldScope]
Inflation	The ratio of the change in the consumer price index from the previous year [http://datacatalog.worldbank.org/]
GDP	GDP per capita of the home country that a firm belongs to [http://datacatalog.worldbank.org/]
Emerging	An indicator that equals one if the home country is classified as one of emerging markets and zero otherwise [http://faculty/tuck.dartmouth.edu/rafael-laporta/researcj-publications/]
Civillaw	An indicator variable that equals one for countries with a Civil-law tradition and zero otherwise [http://faculty/tuck.dartmouth.edu/rafael-laporta/researcj-publications/]
Regqual	Measures the ability of the government to formulate and implement policies and regulations. [http://info.worldbank.org/governance/wgi/index.aspx#home]
RuleLaw	Measures the quality of contract enforcement, property rights, the police and the courts, as well as the likelihood of crime and violence [http://info.worldbank.org/governance/wgi/index.aspx#home]
Goveffect	Measures the quality of public services, the degree of its independence from political pressure and the credibility of the government [http://info.worldbank.org/governance/wgi/index.aspx#home]
Polstab	Measures the likelihood of political instability, including terrorism [http://info.worldbank.org/governance/wgi/index.aspx#home]

APPENDIX B

Three components of board reforms

This table reports the impact of three different components of board reforms on audit fees. Ln(AudFee) is the log-transformed value of audit fees. Columns (1) and (2) report results with all reforms related to board independence. Columns (3) and (4) report results with all reforms related to the audit committee. Columns (5) and (6) report results with all reforms related to CEO/chairman duality.

	(1)	(2)	(3)	(4)	(5)	(6)
	Independence		Audit Committee		Duality	
$PostReform_{t-1}$		0.001		−0.006		0.061
		(0.02)		(−0.12)		(0.93)
$PostReform_{t}$	0.154**	0.068	0.141**	0.058	−0.030	0.032
	(2.60)	(1.13)	(2.36)	(0.95)	(−0.41)	(0.39)
$PostReform_{t+1}$		0.204***		0.190**		0.080
		(2.79)		(2.59)		(0.90)
$PostReform_{t>=2}$		0.221**		0.199*		−0.040
		(2.27)		(1.98)		(−0.42)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	87,504	87,504	87,504	87,504	87,504	87,504
Adj. R^2	0.835	0.835	0.835	0.835	0.835	0.835

This table reports the impact of three reform components on audit fees. Based on columns (1) through (4), board reforms involving board independence and audit committees are positively associated with audit fees in the year after reforms. Reforms involving board independence increase audit fees by 9.7% in the next year. In a similar manner, audit committee-related board reforms increase audit fees by 8.9%. In contrast, reforms related to the separation of CEO/chair duality result in a drop in audit fees by 12.8% in 3 years after reforms. Hence, there is a positive, but less significant, association between reforms related to the separation of chair and CEO positions and audit fees. This is consistent with Baliga et al.'s view (1996), showing that firm performance is indifferent to changes in a firm's duality status. Moreover, our audit committee and board independence results are consistent with Carcello et al. (2002), who find a more independent, diligent and expert board demands higher audit quality that increases audit fees. It is worthwhile to note that we exclude duality-related board reforms for our main analyses.

APPENDIX C

Two types and components of board reforms

This table reports the impact of two different types and components of board reforms on audit fees. The coefficients and t-values of control variables are included in regressions but omitted for brevity. Detailed definitions of variables are included in Appendix A. Numbers in parentheses are *t*-statistics calculated using standard errors clustered at the country level. ***, ** and * indicate a two-tailed test significance level at 1, 5 and 10%, respectively.

	(1)	(2)	(3)
	Dependent variable: $Ln(AuditFee)_t$		
$PostReform^{Indep}_t$	0.035		
	(0.43)		
$Regulation \times PostReform^{Indep}_t$	0.333**		
	(2.43)		
$PostReform^{Audit}_t$		0.017	
		(0.21)	
$Regulation \times PostReform^{Audit}_t$		0.346**	
		(2.57)	
$PostReform^{Duality}_t$			−0.030
			(−0.41)
$Regulation \times PostReform^{Duality}_t$			0.738***
			(6.87)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Country FE	Yes	Yes	Yes
Observations	87,504	87,504	87,504
Adj. R^2	0.836	0.836	0.835

This table presents the moderating effect of enforcement level of board reforms, rule-based reforms versus "comply-or-explain," on the association between board reform components and audit fees. Column (1) shows that rule-based reforms on board independence significantly increase audit fees by 23.3%. Next, in column (2), consistent with our previous result in Table 5, rule-based reforms on the separation of chair and CEO positions do not have a statistically significant impact on audit fees. Meanwhile, for all columns in Table 5, the coefficients on $PostReform^{Indep}_t$, $PostReformr^{Audit}_t$ and $PostReform^{Duality}_t$ are not statistically significant. In other words, the effect of mandatory board reforms on audit fees is significant only when rule-based board reforms involve board independence and audit committees. Taken together, auditors price the level of enforcement and board reform components differently.

APPENDIX D

Summary of board reforms in 29 countries

Australia

The Australian Audit Reform and Corporate Law Economic Reform Program Act of 2004 (CLERP 9) and the introduction of the Principles of Good Corporate Governance, by the Australian Stock Exchange (ASX), deal with board independence, audit committee independence and CEO/director chairmanship. Specifically, these reforms are related to audit, disclosure, shareholder participation, executive remuneration and enforcement. These reforms are enforced with comply-or-explain in 2004.

Austria

The Vienna Stock Exchange enacted the Austrian Code of Corporate Governance in 2004, which involves board independence and audit committee. The reform is enforced with comply-or-explain basis.

Belgium

The Belgian Code on Corporate Governance involves board independence, audit committee independence and CEO/director chairmanship. Specifically, the code, enforced by Committee Lippens, forced all Belgian listed companies to prepare consolidated financial statements that accord with international accounting standards. The reform is enforced with comply-or-explain in 2005.

Canada

The Canadian corporate law and securities regulation with several national and multilateral securities instruments involve board independence, audit committee independence and CEO/director chairmanship. Specifically, reform emphasizes a certification requirement for corporate officers and disclosure standards, which are expected to improve the transparency in governance structures and practices. The reform is enforced with legal rule in 2004.

China

The Code of Corporate Governance was issued by the Chinese Securities Regulatory Commission and the State Economic and Trade Commission, which involve in board and audit committee independence. Specifically, this code follows OECD Principles of Corporate Governance to follow international accounting standards. The reform is enforced with comply-or-explain in 2001.

Denmark

Norby Committee adopted Recommendations for Good Corporate Governance, which deals with board independence. Specifically, the recommendations have seven sections, which are the role of shareholders and interaction with management, the role of stakeholders, transparency, responsibilities and composition of board, remuneration to the management and risk management. The reform was enforced with comply-or-explain in 2001.

Finland

Corporate Governance Recommendation for Listed Companies involve in board and audit committee independence, and CEO/director chairmanship. It increases operational transparency and improves the quality of disclosure. Moreover, it also includes general shareholder meetings, supervisory boards, board committees, managing directors, compensation, internal audits, risk management, insider administration, external audits and disclosure. The reform is enforced with comply-or-explain in 2004.

France

Financial Security Law was passed to reinforce the legal position on corporate governance, which involve audit committee independence. Specifically, it targets transparency and ethics within companies. The Financial Security Law is similar to the Sarbanes-Oxley Act in the United States. The reform is enforced with legal rule in 2003.

Germany

The German Corporate Governance Code, adopted by German General Minister of Justice, involves in board and audit committee independence. The code includes shareholder and the general meeting, management board, supervisory board, transparency and reporting and auditing annual financial statements. Later, it was enforced with Transparency and Disclosure Law. The reform is enforced with comply-or-explain in 2002.

Greece

Hellenic Law 3016/2002 is enacted by Hellenic Capital Market Commission (HCMC). Its main purposes are on composition of board of directors and internal audit function. It consists of 11 articles, such as Board of Directors Members (Article 3), Independent nonexecutive Board Members (Article 4) and Audit Department Set-up (Article 7). The reform is enforced with legal rule in 2002.

Hong Kong

Hong Kong Exchanges and Clearing Limited published Exposure of Draft Code on Corporate Governance Practices and Corporate Governance Report, which deals with board and audit committee independence, and CEO/director chairmanship. It was benchmarked against the best prevailing market practices and international standards of corporate governance. The reform was enforced with comply-or-explain in 2005.

India

The Clause 49 deals with board and audit committee independence. It reinforces a minimum percentage of independent directors, board meetings, codes of conduct, limits on directorships, power of the audit committee, certification by the CEO and CFO of financials. Moreover, the Clause 49 covers all listed companies and firms that violate the regulations can be delisted financially punished. The reform was enforced with legal rule in 2002.

Israel

The Companies Law was imposed based on legal law to reinforce board and audit committee independence. Specifically, the law allows flexibility in balancing the needs of economic freedom, capital formation and shareholder protection. Moreover, it covers key principles of corporate governance, such as the establishment of corporate organs, articulation of fiduciary obligations and shareholder rights, accountability and liability of directors and independence of directors. The reform is enforced with legal rule in 2000.

Italy

The Italian Stock Exchange (Borsa Italiana) imposes Corporate Governance Code, which deals with board and audit committee independence. Before this reform, Savings Law (Law 262) was adopted in order to control appointment and requirements of directors, the composition and powers of the board of statutory auditors and other controlling bodies for monistic and dualistic models. A new Corporate Governance Code is adopted in order to strengthen corporate governance among listed companies and equivalent to the US Sarbanes-Oxley Act. The reform was enforced with legal rule in 2006.

Japan

The Commercial Code involves in board and audit committee independence. Specifically, the code strengthens shareholder rights by enforcing shareholder's participation in meetings, right to dissolve the company and disclosure of shareholdings. Moreover, it sets new principles for management structure, by having outside independent directors and enforcing director's duties. Last, the code increases transparency in accounts and audits by setting up new accounting standards and requiring independent auditors. The reform is enforced with legal rule in 2002.

Malaysia

The Malaysian Code on Corporate Governance deals with board and audit committee independence. More specifically, the code focuses on boards of directors, directors' remuneration, shareholders and accountability and audit. It sets principles and best practices of structures and processes that companies utilize to achieve optimal corporate governance. The reform was enforced with comply-or-explain in 2001.

Netherlands

The Dutch Corporate Governance Code, imposed by the Ministry of Finance and Economic Affairs, deals with board and audit committee independence and CEO/director chairmanship. It covers a comprehensive range of corporate governance in compliance with and enforcement of the code, the management board, the supervisory board, the shareholders and general meeting of shareholders, the audit of the financial reporting and the position of the internal auditor function and of the external auditor. The reform was enforced with comply-or-explain in 2004.

Norway

The Norwegian Code of Practice for Corporate Governance deals with board and audit committee independence and CEO/director chairmanship. It is based on a provisional national code. It strengthens shareholders' confidence in listed companies and makes many recommendations for the protection of minority shareholders, board independence, internal control and company leadership. Moreover, it also set principles for relationships with the public, external investors and creditors. The reform was enforced with comply-or-explain in 2005.

Pakistan

The Securities and Exchange Commission of Pakistan imposed the Code of Corporate Governance, which deals with audit committee independence. It sets new principles for accounts and audits by requiring quarterly accounts, which are reviewed by auditors with directors' certification in accordance with international accounting standards. Moreover, the code requires auditors to report any inaccuracies to the board of directors. The reform was enforced with comply-or-explain in 2002.

Philippines

The Securities and Exchange Commissions enacted Circular No. 2, which is titled Code of Corporate Governance. Its main focus is on the board governance, such as composition of the board, multiple board seats and qualifications of directors. At the same time, it also emphasizes the responsibilities and the role of audit committee. The reform was enforced with comply-or-explain in 2002.

Poland

The Warsaw Stock Exchange adopted The Best Practices in Public Companies Code for listed companies. In rule 20, it emphasizes the board independence, by requiring at least half the members of the board should be independent members. Without the consent of the majority of the board members, no resolutions should be adopted. The reform was enforced with comply-or-explain in 2002.

Portugal

The Securities and Exchange Commission adopted Recommendations on the Governance of Listed Companies in 2001. It focuses on the management and supervisory boards and information and auditing. The recommendation emphasizes the duties and structure of the board of directors and other committees, such as an audit committee. The reform was enforced with legal rule in 2001.

Singapore

The Code of Corporate Governance, imposed by the Ministry of Finance and Monetary Authority of Singapore, deals with board and audit committee independence. It has four main sections in accordance with international standards. It focuses on board matters, remuneration matters, accountability and audit and communication with shareholders. The reform was enforced with comply-or-explain in 2003.

South Korea

The revised Securities Trading Act of 1999, a corporate governance reform, resulted in laws mandating changes in areas such as board independence and financial structure. It requires more than 50% of board members with at least three board of directors for the firms with more than $1.5 billion. It also requires the majority of audit committee members to be independent. The reform was enforced with legal rule in 1999.

Spain

The Unified Code deals with board and audit committee independence by forcing companies to evaluate their disclosure statements with internationally recognized best practices. It addresses broader and internationally recognized corporate governance reform, which forces companies to improve their corporate governance practices. The reform was enforced with comply-or-explain in 2006.

Sweden

The new Companies Act, supplemented with a national code of corporate governance for listed companies, deals with comprehensive board and audit committee independence and CEO/director chairmanship. The Swedish government completed a revision of the Companies Act of 1975. It aims to strengthen the governance of Swedish companies to ensure that companies focus on the best interest of the owners. The reform was enforced with comply-or-explain in 2006.

Thailand

The Principles of Good Corporate Governance was initiated by establishing the National Corporate Governance Committee. It aims to improve shareholders' rights, the effectiveness of the board and stakeholders' rights. As a part of reform, Thai rating and information services announce the initiations of issuing corporate governance ratings. Moreover, it addresses concerns on lending/investing in related parties, enhancing the structure of the board and selecting the external auditors for commercial banks. The reform was enforced with comply-or-explain in 2002.

UK

The Cadbury and Greenbury Reports were merged into the Combined Code, which deals with board and audit committee independence, and CEO/director chairmanship. It focuses on the separation of the role of chief executive and chairman, balanced composition of the board, selection processes for nonexecutive directors, transparency of financial reporting and stronger internal controls. The reform was enforced with comply-or-explain in 1998.

United States

The Sarbanes-Oxley Act, the most important US corporate governance reform, deals with board and audit committee independence. It strengthens rules on board independence, the role of audit committees, reporting and disclosure requirements and certification of financial statements by CEO and CFO. Moreover, it established the Public Company Accounting Oversight Board to supervise audits of public companies. The reform was enforced with legal rule in 2003.