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International evidence on economic policy uncertainty and asymmetric adjustment of audit pricing: Big 4 versus non-big 4 auditors

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Abstract

By investigating the association between economic policy uncertainty and audit fees using data from eight countries, this study examines whether and how Big 4 auditors reinforce their advantages over non-Big 4 auditors through audit pricing. We find that both Big 4 and non-Big 4 auditors reduce their audit fees when economic policy uncertainty increases. However, while non-Big 4 auditors adjust audit pricing asymmetrically as economic policy uncertainty changes, i.e., the magnitude of decline in audit fees when economic policy uncertainty increases exceeds the magnitude of rise when economic policy uncertainty decreases, Big 4 auditors regulate their audit pricing in a symmetric manner. Further analyses reveal that: (1) the asymmetric pricing of non-Big 4 auditors mainly exists in countries where Big 4 auditors have dominant market share, (2) Big 4 auditors provide higher-quality audits when economic policy uncertainty increases and (3) many firms in better financial condition turn to Big 4 auditors during uncertain years. Our findings suggest that the symmetric audit pricing helps Big 4 auditors maintain a favorable position in the audit market.

KEYWORDS

asymmetric adjustment of audit pricing, Big 4 and Non-Big 4 auditors, economic policy uncertainty

1 | INTRODUCTION

In the past several decades, an essential feature of the global audit market has been the market dominance of the Big 4[1] auditors (Walker & Johnson, 1996). In most audit markets worldwide, concentrations of Big 4 auditors generally range from 50 to 98 percent depending on the measure of market share used (Karim, 2010). In the US, 70.4 percent of firms were audited by Big 4 auditors in 1999, and the number climbed to over 90 percent in 2009 (Beattie, Goodacre, & Fearnley, 2003; Boone, Khurana, & Raman, 2012). This high level of concentration has raised the concern of regulators. As early as 2002, the Sarbanes-Oxley Act required the US Comptroller General to study the factors that had led to

[1] We use Big 4 as a generic term encompassing the Big 6, Big 5, and Big 4 to reflect the consolidation of these firms.

audit market concentration. This study was heightened by the concern that the dominant auditors would impede competition in the audit market, thus further deteriorating audit quality. In 2010, the European Commission issued a green paper and listed questions such as whether the audit market is competitive and whether audit market concentration is harmful as critical topics of interest. Another example is that the former SEC Chairman, Christopher Cox, expressed his concerns in a speech at the 2005 AICPA National Conference (Cox, 2005):

> … *within the accounting profession and within the SEC, we are forced to ask ourselves: "Is this intense concentration in the market for large public company auditing good for America?"*

The regulators' concerns have greatly sparked the interest of researchers, and a substantial amount of work has been done to understand what contributes to the market power of Big 4 audit firms (Beattie et al., 2003; Doogar & Easley, 1998). However, most of the extant literature focuses on auditor quality attributes such as industry specialization, audit quality, and professional reputation (Craswell, Francis, & Taylor, 1995; Dunn & Mayhew, 2004; Dutillieux, Stokes, & Willekens, 2013; Khurana & Raman, 2004; Krishnamurthy, Zhou, & Zhou, 2006), and empirical evidence on how Big 4 auditors reinforce their advantages over non-Big 4 auditors through audit pricing is limited. According to Simunic (1980), price competition is a significant aspect of competition between Big 8 and non-Big 8 auditors, and such competition prevails throughout the market for audits. Therefore, it is necessary to see whether and how Big 4 auditors build their competitive edge through audit pricing. Concerning audit pricing, there is a vast literature examining the determinants of audit fees, while most studies focus on internal factors such as client size, complexity, and inherent risks (Ettredge, Fuerherm, & Li, 2014; Hay, Knechel, & Wong, 2006; O'Keefe, Simunic, & Stein, 1994). Little attention is paid to studying how auditors adjust audit pricing with external environments. In particular, to the best of our knowledge, there is no study investigating whether auditors adjust audit pricing in a symmetric manner when the external environment changes.

Our study fills the gap in prior literature by examining how Big 4 and non-Big 4 auditors adjust audit pricing as the external environment changes. Specifically, we investigate whether the upward adjustment of audit fees when economic policy uncertainty decreases and the downward adjustment when economic policy uncertainty increases are performed in a symmetric way. We use the economic policy uncertainty index (EPU index), constructed by Baker, Bloom, and Davis (2013), to capture the fluctuation of external economic policy environments in time series. This index is a weighted average of three components, i.e. the news-based component, the expiring tax code component,[2] and the forecaster disagreement component. The EPU index is a good measure to capture the overall external economic environment, and has recently drawn the interest of many researchers with a wide range of applications (Francis, Hasan, & Zhu, 2014; Gulen & Ion, 2015; Zhang, Han, Pan, & Huang, 2015). Taking advantage of the EPU index, we are able to better identify the audit pricing pattern of Big 4 and non-Big 4 auditors as external economic policy uncertainty changes.

Prior research finds that economic policy uncertainty has a depressing effect on corporate investments (Panousi & Papanikolaou, 2012). We argue that the decreased investments will slow economic growth and reinforce firms' financial constraints. Therefore, auditors will reduce audit fees when economic policy uncertainty increases. Unlike in periods when economic policy becomes uncertain, firms are subject to less cost-cutting pressure as economic policy uncertainty decreases. As a result, auditors are inclined to increase audit fees to compensate for the loss arising from reduced audit fees in uncertain years. In the long term, the rise of audit fees when uncertainty decreases should be sufficient to recover the reduced audit fees in uncertainty years. Otherwise, auditors will suffer from a loss in revenues, and their competitiveness will be weakened.

However, when auditors increase audit fees, they are at the risk of losing clients because price is one of the most critical considerations when clients change auditors. We conjecture that compared with non-Big 4 auditors, Big 4 auditors have stronger bargaining power and are more capable of increasing audit fees when uncertainty decreases. That is, although both Big 4 and non-Big 4 auditors offer fees reductions in uncertain years, Big 4 auditors are better able to recover these reduced audit fees when economic uncertainty deflates. The reasons for this difference are that firms'

[2] This component is used only when calculating the EPU index of the US.

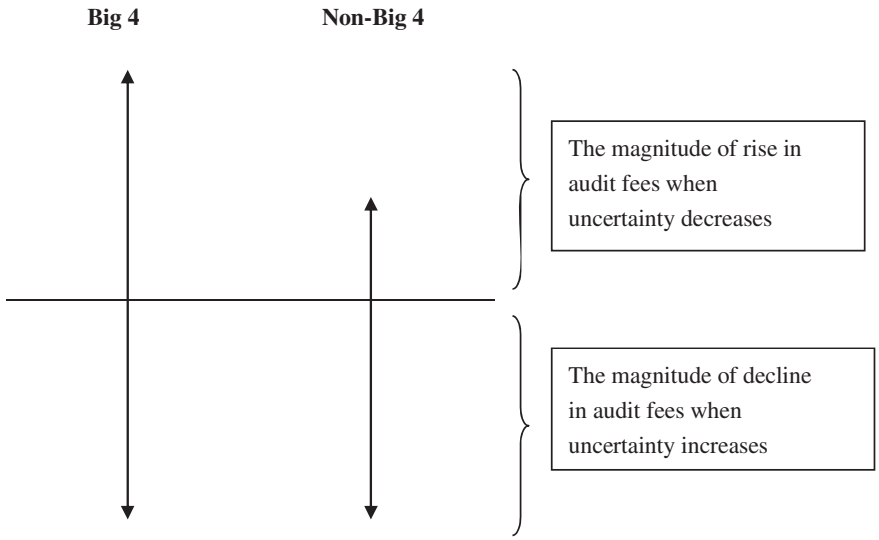

FIGURE 1 The symmetric pricing of the big 4 and asymmetric pricing of the non-Big 4 auditing firms

investment demands increase during certain years and firms that demand high-quality audits are willing to pay for high-quality audit services provided by Big 4 auditors to decrease information asymmetry and obtain benefits such as a higher earnings response coefficient and lower cost of capital (Khurana & Raman, 2004; Teoh & Wong, 1993). In addition, Big 4 auditors are better able to maintain a long-term relationship with clients because their high-quality audit and satisfying service can compensate their clients for the increased fees. In contrast, non-Big 4 auditors cannot substantially raise audit fees when economic policy uncertainty decreases because they are weaker in terms of service quality and because they expect to compete with Big 4 auditors by charging lower prices. Finally, clients of Big 4 auditors face higher switching costs when they turn to other auditors because it may be difficult for them to hire another Big 4 auditor due to geographic restrictions or industry specialization demands (Cox, 2005). Furthermore, switching to a non-Big 4 auditor may cause a negative market reaction (Knechel, Naiker, & Pacheco, 2007). Empirical results support our conjecture that Big 4 auditors are more capable than non-Big 4 auditors of increasing more audit fees when economic policy uncertainty decreases.

Figure 1 synthesizes our results. First, for both Big 4 and non-Big4 auditors, audit fees decrease when economic policy uncertainty increases. Second and more importantly, Big 4 auditors adjust audit pricing symmetrically as economic uncertainty changes, with the magnitude of decline in audit fees when uncertainty increases equaling the magnitude of rise in audit fees when uncertainty decreases. Non-Big 4 auditors adjust audit pricing asymmetrically, which manifests as greater fee reduction when economic policy uncertainty increases and lesser fee increase when economic policy uncertainty decreases. This distinction in audit pricing enables Big 4 auditors to earn more revenues than non-Big 4 auditors and further widens the gap between Big 4 auditors and non-Big 4 auditors. As a result, Big 4 auditors could develop in a sustainable and competitive manner, while non-Big 4 auditors continue to fall behind. These findings deepen our understanding of why Big 4 auditors keep maintaining a dominant position in the audit market.

To confirm the reliability of our results, we conduct several robustness tests. First, given that US firms represent more than half of our sample, we remove US firms from our sample, to exclude the possibility that our results may be driven by these US firms. Second, we exclude firms with less than 3 firm-year observations. By dropping these firms, the concern of survivorship bias can be alleviated to some extent; therefore, we can better identify the impact of economic policy uncertainty on audit fees over time. Our results hold after conducting these robustness tests.

In additional tests, we investigate changes in audit quality and the flow of clients under different economic policy environments. Regulators have expressed concerns that reduced audit fees might threaten audit quality because fee concessions made by auditors will limit the available resources to increase audit efforts, thus further deteriorating audit quality (Ettredge et al., 2014). Therefore, in this part, we examine the impact of economic policy uncertainty on

audit quality. Our results show that audit quality is improved when economic policy uncertainty increases. The reasons may be that auditors become more conservative and tend to maintain audit effort when faced with increased engagement risk (Beck & Mauldin, 2014). We also find that compared with non-Big 4 auditors, Big 4 auditors issue more modified audit opinions when economic policy uncertainty increases. This evidence suggests that although both Big 4 and non-Big 4 auditors reduce audit fees in uncertain years, Big 4 auditors perform audits of higher quality. Under this circumstance, firms are more likely to choose Big 4 auditors because they can enjoy a high-quality audit service while paying a relatively low cost.

In addition, we analyze the flow of clients under different economic policy uncertainty conditions to investigate how Big 4 auditors take advantage of audit pricing to gain a competitive advantage. The descriptive analysis shows that when economic policy uncertainty increases, 53.08 percent of firms switch from non-Big 4 auditors to Big 4 auditors, while only 29.21 percent of firms switch from Big 4 auditors to non-Big 4 auditors. Furthermore, the clients switching to Big 4 auditors display better profitability, higher growth, more cash flow, lower leverage, and larger size. These findings provide evidence that Big 4 auditors attract more high-quality clients than non-Big 4 auditors in uncertainty years, as Big 4 auditors reduce audits fees and maintain high-quality audits.

Our study contributes to the extant literature in the following ways. First, our study adopts an external setting, i.e., the change in economic policy uncertainty, to study the audit pricing pattern of Big 4 and non-Big 4 auditors. We find that non-Big 4 auditors adjust audit pricing asymmetrically as economic policy uncertainty changes, i.e., the magnitude of decline in audit fees when economic policy uncertainty increases exceeds the magnitude of rise when economic policy uncertainty decreases. In contrast, Big 4 auditors regulate their audit pricing in a symmetric manner. To the best of our knowledge, this is the first study to examine how Big 4 and non-Big 4 auditors react to changes in economic policy uncertainty in terms of audit pricing.

Second, our paper is related to the academic literature on audit market concentration. An extensive literature examines how Big 4 auditors maintain their competitive edge in audit markets from the perspectives of industry specialization, audit quality, and professional reputation (Craswell et al., 1995; Dunn & Mayhew, 2004; Dutillieux et al., 2013; Khurana & Raman, 2004; Krishnamurthy et al., 2006), while limited work has been done to understand how Big 4 auditors reinforce their advantage over non-Big 4 auditors through audit pricing. DeFond and Zhang (2014) point out that future researchers should focus more on how Big N auditors improve audit quality and build competitive advantages, and less on whether Big N do a better job. Our study answers their call by investigating how Big 4 auditors establish their competitive edge over non-Big 4 auditors through performing strategic audit pricing when the economic environment changes.

Third, this study contributes to the literature on how the external economic environment influences audit pricing. Prior studies find that auditors reduced audit fees during the financial crisis (Christensen, Omer, Sharp, & Shelley, 2014; Ettredge et al., 2014). Our study differs from this stream of research in that previous studies only provide evidence on short-term adjustments of audit fees during the economic downturn by limiting their sample period around the financial crisis. Empirical evidence is missing when it comes to how audit pricing adjusts as the economy starts to recover from recession. Our study expands the research perspective to long-term adjustments of audit fees. We collaborate the findings of prior studies by not only showing how auditors strategically adjust audit pricing during economic recession, but also when the economy is turning up.

The remainder of this paper is organized as follows. Section 2 reviews and discusses the related literature. Section 3 develops our hypotheses. Section 4 outlines the research design and describes the data and sample. Section 5 presents the empirical results. Section 6 contains robustness test and additional tests. Section 7 concludes.

2 | LITERATURE REVIEW

2.1 | Determinants of audit fees

There is vast literature examining the determinants of audit fees. Theoretically, it is believed that audit fees are determined by the underlying risk of an audit (Bell, Landsman, & Shackelford, 2001; Hogan & Wilkins, 2008; Niemi, 2002;

Simunic, 1980). Based on this fundamental theory, prior literature provides extensive empirical evidence concerning the determinants of audit fees from the perspectives of client attributes, auditor attributes, and engagement attributes (Hay et al., 2006). For example, previous literature suggests a positive relationship between audit fees and firm complexity, as a higher level of complexity generally indicates higher audit risk (Ettredge et al., 2014; O'Keefe et al., 1994). Other research argues that firms holding a large amount of inventory or receivables are subject to high inherent risk, and the audit fees charged for these firms are significantly higher than for other firms (Boone, Khurana, & Raman, 2014; Huang, Raghunandan, Huang, & Chiou, 2014). As for the auditor attributes, extant literature finds that auditors providing higher quality audit and with longer tenure tend to charge higher audit fees (Khurana & Raman, 2004; Kwon, Lim, & Simnett, 2014). In addition, engagement attributes such as audit problems and report lag are found to be positively related with audit fees (Francis, 2004; Knechel & Payne, 2001).

Despite the extensive literature on how audit-related factors affect audit fees, research on the influence of external environments on audit fees is relatively sparse. One school of studies document the influence of a country's legal environment on audit fees, finding that an increase in litigation exposure strengthens auditor's incentive to provide higher quality audits and reduce litigation costs, thereby increasing audit fees (Choi, Kim, Liu, & Simunic, 2008; Simunic & Stein, 1996; Venkataraman, Weber, & Willenborg, 2008). Another school of research finds that audit fee decreases during recessionary periods such as financial crisis (Christensen et al., 2014; Ettredge et al., 2014). Studies in this area argue that auditors have to reduce audit fees during financial crisis due to increasing bargaining power of clients (Cheffers & Whalen, 2011). Some other studies investigate the impact of mandatory IFRS adoption on audit fees, finding that IFRS adoption leads to an economy-wide increase in audit fees because of higher compliance costs from greater exposure to audit complexity (De George, Ferguson, & Spear, 2013; Kim, Liu, & Zheng, 2012). In sum, prior literature mainly focuses on audit-related factors from micro perspectives. Limited research has been done from a macro perspective (Choi et al., 2008), especially on how environmental factors such as economic policy uncertainty affects audit pricing.

2.2 | Comparison between big 4 and non-big 4

Ample empirical evidence comparing Big 4 and non-Big 4 accounting firms has been published from various perspectives. To some extent, these studies were inspired by both regulatory and practical concerns about the superiority of Big 4 auditors and its subsequent influence on audit and capital markets. Regarding the distinctions between Big 4 and non-Big 4 auditors, prior studies focus on audit quality (Behn, Choi, & Kang, 2008; Khurana & Raman, 2004), industry expertise (Ferguson, Francis, & Stokes, 2006; Numan & Willekens, 2012), brand name reputation (Craswell et al., 1995; Francis & Wang, 2008), audit conservatism (Chung, Firth, Kim, & Pang, 2014), and audit fees (DeFond, Francis, & Wong, 2000; Simunic, 1980).

The most discussed topic concerning distinctions between Big 4 and non-Big 4 auditors is audit quality. By using a variety of variables as proxies for audit quality, prior literature generally concludes that the audit quality of Big 4 auditors is superior to that of non-Big 4 auditors. For example, Becker, DeFond, Jiambalvo, and Subramanyam (1998) and Francis, Maydew, and Sparks (1999) find that firms audited by Big 6 auditors exhibit lower income-increasing discretionary accruals. Teoh and Wong (1993) suggest that higher perceived audit quality is positively related to the earnings response coefficient and find that the stock price reaction to the announcement of unexpected positive earnings is larger for Big 6 clients. Other studies posit that high-quality Big 4 audits could help market participants forecast further earnings more accurately. For example, Krishnan (2003) provides empirical evidence that the association between discretionary accruals and future earnings is more pronounced for Big 4 than for non-Big 4 clients. Behn et al. (2008) show that analysts of Big 4 clients have greater forecast accuracy than analysts of non-Big 4 clients. In addition, Khurana and Raman (2004) and Cassell, Giroux, Myers, and Omer (2013) find that Big 4 clients have a lower cost of capital than non-Big 4 clients in the United States. However, while much of the literature documents that Big 4 auditors provide higher quality audits than non-Big 4 auditors, some studies find inconsistent evidence. For example, by employing the PSM (propensity score matching) methodology, Lawrence, Minutti-Meza, and Zhang (2011) find that the difference in audit quality between Big 4 and non-Big 4 auditors can be primarily attributed to client characteristics. DeFond, Erkens, and

Zhang (2017) argues that the findings of Lawrence et al. (2011) are affected by PSM's sensitivity to its design choices and the choice of specific audit quality measures. Thus, whether Big 4 auditors can provide high-quality audit services remains an open question for further research.

With regard to industry expertise, extant studies commonly assert that Big 4 auditors are more specialized than non-Big 4 auditors (Craswell et al., 1995). Dutillieux et al. (2013) note that Big 4 auditors invest in industry-specific audit methodologies, additional staff training, and industry knowledge to differentiate themselves from the non-specialists. Other studies note that the accumulated industry expertise could help Big 4 auditors charge higher fee premiums relative to other auditors (Craswell et al., 1995; Ferguson et al., 2006; Numan & Willekens, 2012).

With superior audit quality and industry expertise, Big 4 auditors have a better brand name reputation (Khurana & Raman, 2004; Krishnamurthy et al., 2006). The better reputation of Big 4 auditors helps attract clients who are in need of high-quality audits and results in substantial brand name premiums. For example, Craswell et al. (1995) find that Big 8 auditors enjoy approximately 30 percent greater brand name premiums than non-Big 8 auditors. The reputational capital of Big 4 auditors, in turn, guarantees and improves audit quality because Big 4 auditors have more reputational capital at risk and, therefore, are more sensitive to client audit risk and its effect on auditor reputation (Francis & Wang, 2008).

Another important area of research focuses on fee disparities between Big 4 and non-Big 4 auditors. Most studies find that Big 4 firms enjoy higher fee premiums than non-Big 4 auditors (DeFond et al., 2000; Simunic, 1980), and this audit fee disparity is attributable to Big 4 firms' superior audit quality, industry expertise, and brand name reputation (Craswell et al., 1995; Ferguson et al., 2006; Numan & Willekens, 2012).

While there is an extensive literature investigating the distinctions between Big 4 and non-Big 4 auditors, our knowledge on how Big 4 and non-Big 4 auditors compete for clients through audit pricing is very limited. Our research fills this gap by investigating the relationship between audit pricing and economic policy uncertainty and differences in this relationship between Big 4 auditors and non-Big 4 auditors.

3 | HYPOTHESIS DEVELOPMENT

Economic policy uncertainty may affect audit fees in multiple ways. From the traditional risk view of audit pricing, increased EPU may lead to higher audit fees. On the one hand, as economic policy uncertainty increases, firms may suffer from shrinkage of product market and become more financially constrained (Zhang et al., 2015), which leads to more misstatement in financial reports (Kurt, 2017), thereby exposing auditors to greater risk of material misstatement (inherent risk and control risk). Under this circumstance, auditors are more likely to fail in detecting material misstatements (i.e. the detection risk increases). As a result, auditors may charge higher audit fees. On the other hand, auditors have to deal with greater audit complexity in uncertain years, because the possibilities of firms' getting involved in loan lawsuits or debt restructuring increase during uncertain periods. Therefore, auditors may require higher audit fees to compensate for the consequential extra audit efforts. Based on the reasoning above, it is likely that auditors will increase audit fees when the external economic environment deteriorates.

However, according to Christensen et al. (2014), audit engagements are returning to commodity pricing. They find that audit pricing of financial reporting risk has diminished during the financial crisis, which contradicts the traditional view that audit pricing is a reflection of audit risk (Simunic, 1980; Stice, 1991). The commodity character of audit service indicates that how audit service is priced is affected not only by its internal value (e.g., audit quality, incorporated audit risk), but also by the external environment. This notion is consistent with the theory of price adjustment, which suggests that firms set prices in response to constantly changing market conditions. For example, when competitors' prices or inflation index changes, firms will alter the price of their products (e.g., Arrow, 1959).

Under different external economic environments, firms' willingness and ability to pay for high-priced audit services may vary. Recent literature shows that audit fees decrease during recessionary periods such as financial crises. This is because managers suffer from great pressures to cope with falling revenue, and they expect auditors to share the economic pain by reducing audit fees (Ettredge et al., 2014). As a result, auditors compromise by reducing audit

fees to relieve the substantial pressure from clients because such compromise can prevent the loss of clients (Beck & Mauldin, 2014; Krishnan & Zhang, 2014). Similar to the case during a financial crisis, auditors will reduce audit fees during periods when economic policy is uncertain. Zhang et al. (2015) find that as the degree of economic policy uncertainty increases, firms become more financially constrained as the external financing environment deteriorates. With less free cash flow at hand under the financial constraint, firms may not be able to afford high audit fees. Campello, Graham, and Harvey (2010) survey 1,050 CFOs throughout the world to learn the real effects of financial constraints during financial crisis, and they find that firms sold more assets to fund their operations, gave up many attractive investment opportunities, and planned deeper cuts in technology spending, employment, and capital spending during financial crisis. Another survey by Beattie and Fearnley (1995) documents that 66 percent of public firms in the UK admit that audit fee is a significant concern when they consider switching auditors. Johnson and Lys (1990) find that firms purchase audit services from the least cost supplier, and they tend to dismiss auditors that cannot offer them the most cost-efficient audit services. Therefore, we argue that auditors may reduce audit fees to cater for clients' needs and avoid losing market share when economic policy uncertainty increases. Reducing audit fees during uncertain years is not only a marketing strategy for auditors to maintain regular clients and attract new clients but also an investment in future benefits. When economic policy uncertainty decreases, the clients that are attracted during uncertain years will bring in considerable revenue for auditors, and the rising revenue will compensate for the previous reduced fees. To some extent, this process is similar to the quasi-rent-obtaining behavior of auditors (DeAngelo, 1981).

Unlike in periods when economic policy is more uncertain, firms are subject to less cost-cutting pressure when economic policy became less uncertain. Reduced financial pressure weakens firms' incentive to bargain for audit fee discounts and improves their ability to pay more for high-quality audit services. Considering that clients' pressure to reduce cost has been alleviated, audit firms will charge higher fees, resulting in a rebound in audit pricing as economic policy uncertainty decreases. However, it should be noted that although auditors have demand for increasing audit fees, they cannot ignore the risk of losing clients. This is because firms will switch auditors if the firms and auditors cannot reach a consensus on the fees for the audit service. According to Keaveney (1995), although clients' switching decisions in service industries are affected by multiple factors such as service quality (Bitner, 1990; Boulding, Kalra, Staelin, & Zeithaml, 1993), relationship quality (Crosby, Evans, & Cowles, 1990), and overall service satisfaction (Cronin & Taylor, 1992), the pricing factor is one of the most important reasons for clients to turn to other suppliers. Therefore, if an auditor is not competitive enough in regards to audit quality, client relationship, and client satisfaction, an increase in audit pricing will place the auditor in a passive situation where it may lose both client occupancy and revenues.

We expect that compared with non-Big 4 auditors, Big 4 auditors are more capable of increasing audit fees when economic policy uncertainty decreases and, thereby, compensating for the losses arising from reduced audit fees during uncertain years. The reasons for this expectation are as follows.

First, Big 4 auditors provide firms with higher-quality audit services and help firms gain more benefits such as a higher earnings response coefficient and lower cost of capital (Khurana & Raman, 2004; Teoh & Wong, 1993). As economic policy uncertainty decreases, firms are in greater need of capital to seize the growing investment opportunities. To obtain more low-cost equity and debt capital, firms have to provide capital providers with high-quality accounting information to alleviate the information asymmetries (Khurana & Raman, 2004). Under this circumstance, Big 4 auditors are in an advantageous bargaining position because firms rely on Big 4 auditors to improve their earnings quality and disclosure quality (Krishnan, 2003) and, thereby, lowering the cost of capital.

Second, Big 4 auditors are better able to maintain a long-term relationship with clients. Compared with non-Big 4 auditors, Big 4 auditors have superior attributes such as being more specialized and reputable (Craswell et al., 1995; Dutillieux et al., 2013). These attributes enable Big 4 auditors to improve client satisfaction and, thereby, maintain a long-term cooperative relationship with clients. When Big 4 auditors increase their audit fees, their clients are less likely to switch than those of non-Big 4 auditors because Big 4 auditors' high-quality audits and satisfying service may compensate their clients for the increased fees.

Third, clients of Big 4 auditors face higher switching costs when they turn to other auditors because it may be more difficult for them to hire another Big 4 auditor due to geographic restrictions or industry specialization demands (Cox, 2005). Furthermore, switching to a non-Big 4 auditor will cause a negative market reaction (Knechel et al., 2007).

Based on the aforementioned arguments, we put forward the following hypothesis:

Hypothesis: Both Big 4 and non-Big 4 auditors reduce audit fees when economic policy uncertainty increases, but Big 4 auditors are more capable to recover the loss from reduced audit fees when economic policy uncertainty decreases.

4 | METHODOLOGY AND SAMPLE SELECTION

To test how Big 4 and non-Big 4 auditors adjust audit pricing differently as the external environment changes, we run the following model (1) on subsamples of Big 4 and non-Big 4 auditors.

$$\begin{aligned} LNAF = {} & \beta_0 + \beta_1 LNEPU + \beta_2 LNEPU^{*} DUM + \beta_3 DUM + \beta_4 LNAT + \beta_5 NBS + \beta_6 ROA + \beta_7 LOSS + \beta_8 SPECIAL \\ & + \beta_9 LEV + \beta_{10} MB + \beta_{11} CURRENT + \beta_{12} LIQUIDITY + \beta_{13} BIG4 + \beta_{14} OPINION + \beta_{15} MERGE \\ & + \beta_{16} CROSS + \beta_{17} FDI + \beta_{18} MCAP + \beta_{19} LNGDP + \sum COUNTRY + \sum INDUSTRY + \sum YEAR + \varepsilon \end{aligned} \quad (1)$$

In model (1), the dependent variable is audit fee (*LNAF*), which is equal to the natural log of audit fees in thousands of dollars. The independent variables of interest are *LNEPU*, an indicator dummy *DUM*, and the interaction term between *LNEPU* and *DUM*. *LNEPU* is added as a proxy for external economic policy uncertainty, and it equals the natural log of the economic policy uncertainty index (EPU index). The EPU index is developed by Baker et al. (2013), and it is constructed from three types of underlying components. The first one is the news-based index component, which reflects newspaper coverage of policy-related economic uncertainty. This component is constructed using automated text-search results for major newspapers in each country. Articles meeting the criteria of including terms in all three categories pertaining to uncertainty, the economy, and policy are identified by searching the archives of news containing words such as "uncertainty", "uncertain", "economic", and "economy". The frequency of media mentioning "uncertain" and "economy" reflects the level of economic policy uncertainty. The second component is the tax expiration component, which reflects the number of expiring federal tax code provisions in coming years. Scheduled tax code expirations are a source as well as a reflection of economic policy uncertainty. Since expiring tax code provisions is an idiosyncratic feature of the US, this component is used only when calculating the EPU index of the US. The third component is the forecast disagreement measure, which uses disagreement among economic forecasters as a proxy for uncertainty. Prior literature finds a significant relationship between forecaster disagreement and other measures of uncertainty (Boero, Smith, & Wallis, 2008; Bomberger, 1996; Zarnowitz & Lambros, 1987), indicating that the dispersion of individual forecasts is a reasonable proxy for future economic uncertainty.

DUM is a dummy variable that equals 1 if *LNEPU* of this year is larger than the maximum value of the last two years and 0 otherwise. This dummy measures whether the economic policy uncertainty increases in the current year. In model (1), the coefficient β_1 denotes the impact of economic policy uncertainty (*LNEPU*) on audit fees (*LNAF*) in years when the economic policy uncertainty decreases (*DUM* = 0), and $\beta_1 + \beta_2$ denotes the impact of economic policy uncertainty (*LNEPU*) on audit fees (*LNAF*) in years when economic policy uncertainty increases (*DUM* = 1). We are interested in coefficient β_2 on the interaction term *LNEPU* * *DUM* because it captures the difference in the influence of economic policy uncertainty on audit fees between years when economic policy uncertainty increases and years when economic policy uncertainty decreases. If β_2 is significantly positive or negative, the adjustment of audit fees is significantly different between years when economic policy is certain and years when it is uncertain.

Following previous studies, we include the following firm-level control variables in model (1): Firm size (*LNAT*), which is the natural log of total assets in thousands of dollars, is found to be the most dominant determinant of audit fees across virtually all published studies, and it is expected to have a positive relationship with audit fees (Bell et al., 2001; Simunic, 1980). Number of business segments (*NBS*), which equals the natural log of the number of business segments plus 1, is used to capture a client's complexity. Prior literature typically argues that a complex client generally means

a harder and more time-consuming audit, and we expect a positive coefficient on *NBS* (Choi et al., 2008; Hackenbrack & Knechel, 1997; Simunic, 1980; Zaman, Hudaib, & Haniffa, 2011). Profitability (*ROA*), which is measured as return on total assets, is considered to be an indirect measure of audit risk. That is, auditors consider inferior performance to be a signal of potential audit risk, and they will demand higher audit fees to compensate for that risk (Basioudis, 2007; Hope & Langli, 2010; Mao & Yu, 2015; Simunic, 1980). Therefore, we expect a negative coefficient on *ROA*. Net loss (*LOSS*), which is a dummy variable that equals 1 when a firm reports a net loss and 0 otherwise, is an indicator of operating risk, and we expect it to have a positive coefficient (Hope & Langli, 2010; Kim et al., 2012). Special items (*SPECIAL*), which is a dummy variable that equals 1 if a firm reports special items and 0 otherwise, covers the fact that clients with special items are generally more difficult to audit and are of higher audit risk. As a result, auditors may demand higher audit fees from these firms (Kim et al., 2012). Leverage (*LEV*) is the ratio of total liabilities to total assets, and measures the financial risk of a client, which may potentially expose auditors to loss (Hope & Langli, 2010; Simunic, 1980). Market-to-book ratio (*MB*), which is defined as market value divided by the common shareholder equity, is included in the model because it is associated with firm risk and firm performance (Ashbaugh, LaFond, & Mayhew, 2003). Current assets (*CURRENT*) equals current assets minus cash scaled by total assets (Gul, Wu, & Yang, 2013). Current ratio (*LIQUIDITY*), which equals current assets divided by current liabilities, is included in the model because a low current ratio is associated with greater financial risk (Choi, Kim, Liu, & Simunic, 2009). Big 4 auditor (*BIG4*), which is a dummy variable that equals 1 when a firm is audited by one of the Big 4/6 auditors and 0 otherwise, is included to capture a Big 4 auditor's fee premiums (Choi et al., 2008; DeFond et al., 2000). Audit problems (*OPINION*), which is a dummy variable that equals 1 when a firm receives modified audit opinions and 0 otherwise, is used to indicate modified audit opinions, which act as a proxy for problems in completing the audit, which indicates audit risk and, therefore, increases the audit fees (Simunic, 1980). Mergers and acquisitions (*MERGE*), which is a dummy variable that equals 1 if a firm is engaged in a merger or acquisition and 0 otherwise, covers the fact that clients engaged in M&A need additional audits associated with business combinations and financing activities; these additional audits will increase a firm's total audit fees (Ashbaugh et al., 2003; Kim et al., 2012). Cross-listing (*CROSS*), which equals 1 when a firm is cross-listed in the US and other areas and 0 otherwise, is included in the model as Choi et al. (2009) find that auditors charge firms cross-listed in countries with stronger legal regimes higher fees. Therefore, we expect the coefficients on *CROSS* to be significantly positive.

In addition to the above firm-level control variables, we include several country-level control variables that may affect cross-country variations in audit fees. First, we control for foreign direct investments (*FDI*) because the demand for audit services is likely to be greater in countries with more *FDI* (Choi et al., 2009). Second, we control for *MCAP*, the ratio of stock market capitalization to GDP. A high ratio of stock market capitalization to GDP indicates a high market risk. In addition, we include *LNGDP*, which equals the natural log of gross domestic product per capita in the model because audit fees are likely to be higher in rich countries than in poor countries (Choi et al., 2009). Finally, we control for potential variations in audit fees across countries and industries by introducing country and industry dummies, and we include indicator variables for years to control for audit fee variations over time. The Appendix summarizes the definitions of all variables used in our analysis.

The initial sample includes firms in eight countries, namely, Canada, Germany, France, India, Italy, Spain, the United Kingdom, and the United States, for the period 1996–2013. The choice of sample countries is based not only on the availability of the EPU index, but also on the fact that these countries are the leading economies in modern society. According to the 2006 world GDP rankings, these eight countries contributed to about half of the global GDP, making them good representatives of the world economy. In addition, among the eight countries in our sample, six are members of the Group of Eight (G8), an inter-governmental political forum of the world's major highly industrialized economies. As members of the G8, these countries share similar economic as well as institutional backgrounds, which further improves the validity of choosing them as the research sample. Our sample begins in 1996 because the data on audit fees is subject to several missing values before 1996 (Choi et al., 2009), and we end in 2013 because it is the latest available data when we initiated this research. We collect data on the Economic Policy Uncertainty index from Federal Reserve Economic Data, and all country-level control variables are collected from the World Bank. All other financial data used in our study are retrieved from the Compustat Global and Worldscope database. After excluding observations with missing data, we obtain the final sample with 75,910 firm-year observations.

TABLE 1 Descriptive statistics

Panel A. Descriptive statistics of country-level variables (by country)					
Country	***N***	***LNEPU***	***FDI***	***MCAP***	***LNGDP***
Canada	5,706	4.6671	0.0322	0.7295	10.4026
France	2,548	4.5881	0.0233	0.6561	10.3570
Germany	2,608	4.6799	0.0171	0.5368	10.3987
India	11,453	4.5035	0.0136	0.5526	6.6134
Italy	1,288	4.6492	0.0084	0.4445	10.2371
Spain	928	4.5974	0.0336	1.2006	10.0120
United Kingdom	7,152	4.6557	0.0444	1.3877	10.3889
United States	44,227	4.6296	0.0163	2.1143	10.6360

Panel B. Descriptive statistics of key variables						
Variable	***N***	**Mean**	**Std**	**P25**	**P50**	**P75**
LNAF	75,910	5.7402	1.9433	4.5433	5.8435	7.0926
LNEPU	75,910	4.7353	0.3796	4.3885	4.7569	5.0397
LNAT	75,910	11.9671	2.4487	10.3583	11.9526	13.6062
NBS	75,910	1.0505	0.5332	0.6931	0.6931	1.3863
ROA	75,910	0.0026	0.1778	−0.0459	0.0519	0.1056
LOSS	75,910	0.3899	0.4877	0.0000	0.0000	1.0000
SPECIAL	75,910	0.9357	0.2453	1.0000	1.0000	1.0000
LEV	75,910	0.6771	1.1043	0.3076	0.5126	0.6968
MB	75,910	2.3023	6.2029	0.8033	1.5776	2.9284
CURRENT	75,910	0.3552	0.2223	0.1721	0.3384	0.5116
LIQUIDITY	75,910	2.8052	3.9078	1.0790	1.6689	2.8880
BIG4	75,910	0.5446	0.4980	0.0000	1.0000	1.0000
OPINION	75,910	0.4036	0.4906	0.0000	0.0000	1.0000
MERGE	75,910	0.2742	0.4461	0.0000	0.0000	1.0000
CROSS	75,910	0.0103	0.1008	0.0000	0.0000	0.0000
FDI	75,910	0.0198	0.0171	0.0107	0.0160	0.0226
MCAP	75,910	1.7028	1.0200	0.8576	1.5765	2.3106
LNGDP	75,910	10.1297	1.3013	10.5264	10.6437	10.7804

Notes: Panel A reports the mean statistics for all country-level variables, and Panel B reports descriptive statistics for all variables included in our main regression models. *LNAF* is the natural log of audit fees in thousands of dollars; *LNEPU* is the natural log of economic policy uncertainty index; *LNAT* is the natural log of total assets in thousands of dollars; *NBS* is the natural log of the number of business segments plus 1; *ROA* is the return on total assets; *LOSS* is a dummy variable which equals 1 when a firm reports a net loss and 0 otherwise; *SPECIAL* is a dummy variable which equals 1 if a firm reports special items and 0 otherwise; *LEV* is the ratio of total liabilities to total assets; *MB* is firm market value divided by the common shareholder equity; *CURRENT* is current assets minus cash scaled by total assets; *LIQUIDITY* is equal to current assets divided by current liabilities; *BIG4* is a dummy variable which equals 1 when a firm is audited by one of the Big 4/6 auditors and 0 otherwise; *OPINION* is a dummy variable which equals 1 when a firm receives modified audit opinions and 0 otherwise; *MERGE* is a dummy variable which equals 1 if a firm is engaged in a merger or acquisition and 0 otherwise; *CROSS* is a dummy variable which equals 1 when a firm is cross-listed in the US and other areas and 0 otherwise; *FDI* is foreign direct investment scaled by GDP; *MCAP* is the ratio of stock market capitalization to GDP; *LNGDP* is the natural log of gross domestic product (GDP) per capita in thousands of US dollars; *RL* refers to rule of law; *CORRUPTION* is the corruption index in a country.

TABLE 2 Economic policy uncertainty and audit fees

LNEPU	−0.1955
	(−3.94)***
LNAT	0.5294
	(107.98)***
NBS	0.3185
	(28.76)***
ROA	−0.6173
	(−23.33)***
LOSS	0.0517
	(4.65)***
SPECIAL	0.2649
	(6.66)***
LEV	0.0842
	(16.48)***
MB	0.0042
	(5.20)***
CURRENT	0.3203
	(20.92)***
LIQUIDITY	−0.0186
	(−13.18)***
BIG4	0.3110
	(17.26)***
OPINION	0.1381
	(9.11)***
MERGE	0.1394
	(18.28)***
CROSS	0.6666
	(17.52)***
FDI	0.3905
	(0.53)
MCAP	0.0238
	(1.64)
LNGDP	0.0497
	(0.48)
CONSTANT	−0.6369
	(−0.55)
COUNTRY	Control
INDUSTRY	Control
YEAR	Control
Observations	75,910
Adjusted R^2	0.8594

(Continues)

TABLE 2 (Continued)

Notes: This table shows the influence of economic policy uncertainty on audit fees. The dependent variable is audit fees (*LNAF*), which equals the natural log of audit fees in thousands of dollars; *LNEPU* is the natural log of economic policy uncertainty index; *LNAT* is the natural log of total assets in thousands of dollars; *NBS* is the natural log of the number of business segments plus 1; *ROA* is the return on total assets; *LOSS* is a dummy variable which equals 1 when a firm reports a net loss and 0 otherwise; *SPECIAL* is a dummy variable which equals 1 if a firm reports special items and 0 otherwise; *LEV* is the ratio of total liabilities to total assets; *MB* is firm market value divided by the common shareholder equity; *CURRENT* is current assets minus cash scaled by total assets; *LIQUIDITY* is equal to current assets divided by current liabilities; *BIG4* is a dummy variable which equals 1 when a firm is audited by one of the Big 4/6 auditors and 0 otherwise; *OPINION* is a dummy variable which equals 1 when a firm receives modified audit opinions and 0 otherwise; *MERGE* is a dummy variable which equals 1 if a firm is engaged in a merger or acquisition and 0 otherwise; *CROSS* is a dummy variable which equals 1 when a firm is cross-listed in the US and other areas and 0 otherwise; *FDI* is foreign direct investment scaled by GDP; *MCAP* is the ratio of stock market capitalization to GDP; *LNGDP* is the natural log of gross domestic product (GDP) per capita in thousands of US dollars; *RL* refers to rule of law; *CORRUPTION* is the corruption index in a country. ***, **, and * represent significance at 1%, 5%, and 10% levels.

5 | EMPIRICAL RESULTS

Table 1, Panel A reports the mean statistics for all country-level variables. Column (1) reports the numbers of firm-year observations in each country included in our empirical analysis. As shown in Column (1), US firms represent 58.26 percent of our total sample (44,227 of the 75,910 observations).[3] Columns (2)–(5) report the mean values of all country-level variables by country. The mean value of *LNEPU* is approximately 4.6 for all countries, indicating that the level of economic policy uncertainty is similar across our sample countries. The means of foreign direct investments (*FDI*) and the ratio of stock market capitalization to GDP (*MCAP*) vary largely across different countries. The mean of foreign direct investment (*FDI*) ranges from 0.0084 in Italy to 0.0444 in the United Kingdom, and the mean of the ratio of stock market capitalization to GDP (*MCAP*) ranges from 0.4445 in Italy to 2.1143 in the United States. These statistics indicate that there are large variations in foreign direct investments and *MCAP* ratios across different countries. In terms of *LNGDP*, the means of *LNGDP* for all sample countries are approximately 10.3, except that India exhibits a relatively low *LNGDP* of 6.6134.

Table 1, Panel B reports descriptive statistics for all variables included in our main regression models. The mean of *LNAF* is 5.7402, indicating that the mean audit fees in our sample is approximately US$311,127. The standard deviation of *LNAF* is 1.9433, suggesting that there are large variations in audit fees across different firms. The mean value and standard deviation of *LNEPU* is 4.7353 and 0.3796, respectively. The means of *BIG4* and *MERGE* are 0.5446 and 0.2742, respectively, indicating that 54.46 percent of all sample firms are audited by Big 4/6 auditors and 27.42 percent of the sample firms are engaged in a merger or acquisition. In addition, the statistics for other control variables are within a reasonable range.

In line with the extant literature, we first retest the influence of external environments on audit pricing by regressing audit fees on the EPU index. The results are reported in Table 2. As shown in Table 2, the coefficient on economic policy uncertainty (*LNEPU*) is significantly negative, implying that higher economic policy uncertainty leads to lower audit fees. In other words, auditors will reduce audit fees when economic policy uncertainty increases. These results are in line with previous studies conducted in the context of financial crisis (Beck & Mauldin, 2014; Christensen et al., 2014; Krishnan & Zhang, 2014).

Table 3 reports the empirical results for our hypothesis that Big 4 auditors are better able to recover the loss from reduced audit fees when economic policy uncertainty decreases. As shown in Table 3, the coefficients on *LNEPU* remain significantly negative, suggesting that both Big 4 auditors and non-Big 4 auditors reduce audit fees when economic policy uncertainty increases. More importantly, the coefficient on *LNEPU * DUM* is significantly negative in the subsample of non-Big 4 auditors but not significant in the subsample of Big 4 auditors. This result indicates that for Big 4 auditors, the magnitude of decline in audit fees when uncertainty increases equals the magnitude of rise in audit fees when uncertainty decreases, while for non-Big 4 auditors, the magnitude of decline in audit fees when uncertainty

[3] We exclude US firms from our sample and re-estimate the models to confirm the reliability of our results in the robustness tests section.

TABLE 3 Economic policy uncertainty and audit fees asymmetry

	(1) Big4	(2) Non-Big4
LNEPU	−0.2124	−0.1628
	(−2.77)***	(−2.47)**
*LNEPU * DUM*	−0.0523	−0.1205
	(−0.95)	(−2.00)**
DUM	0.2809	0.6631
	(1.03)	(2.18)**
LNAT	0.5232	0.5351
	(78.02)***	(77.09)***
NBS	0.3294	0.2789
	(33.53)***	(11.28)***
ROA	−0.5663	−0.6062
	(−14.67)***	(−12.39)***
LOSS	0.0805	0.0177
	(8.28)***	(0.81)
SPECIAL	0.1257	0.2648
	(4.50)***	(5.94)***
LEV	0.1642	0.0858
	(10.50)***	(14.47)***
MB	0.0030	0.0044
	(4.03)***	(3.98)***
CURRENT	0.4208	0.1983
	(14.21)***	(8.80)***
LIQUIDITY	−0.0216	−0.0161
	(−10.73)***	(−11.18)***
OPINION	0.0896	0.1672
	(8.31)***	(7.37)***
MERGE	0.1337	0.1442
	(14.50)***	(9.41)***
CROSS	0.6247	0.7199
	(14.52)***	(5.59)***
FDI	−0.4469	0.6590
	(−0.64)	(0.75)
MCAP	0.0298	0.0522
	(2.38)**	(2.64)***
LNGDP	0.4017	−0.0371
	(4.10)***	(−0.42)
CONSTANT	−3.8328	0.0522
	(−3.62)***	(0.05)
COUNTRY	Control	Control
INDUSTRY	Control	Control
YEAR	Control	Control

(Continues)

TABLE 3 (Continued)

	(1) Big4	(2) Non-Big4
Observations	27,856	23,262
Adjusted R^2	0.7817	0.7955

Notes: This table reports the empirical results for the hypothesis that Big 4 auditors are better able to recover the loss from reduced audit fees when economic policy uncertainty decreases. The dependent variable is audit fees (*LNAF*), which equals the natural log of audit fees in thousands of dollars; *LNEPU* is the natural log of economic policy uncertainty index; *DUM* is a dummy variable that equals 1 if *LNEPU* of this year is larger than the maximum value of the last two years and 0 otherwise; *LNAT* is the natural log of total assets in thousands of dollars; *NBS* is the natural log of the number of business segments plus 1; *ROA* is the return on total assets; *LOSS* is a dummy variable which equals 1 when a firm reports a net loss and 0 otherwise; *SPECIAL* is a dummy variable which equals 1 if a firm reports special items and 0 otherwise; *LEV* is the ratio of total liabilities to total assets; *MB* is firm market value divided by the common shareholder equity; *CURRENT* is current assets minus cash scaled by total assets; *LIQUIDITY* is equal to current assets divided by current liabilities; *BIG4* is a dummy variable which equals 1 when a firm is audited by one of the Big 4/6 auditors and 0 otherwise; *OPINION* is a dummy variable which equals 1 when a firm receives modified audit opinions and 0 otherwise; *MERGE* is a dummy variable which equals 1 if a firm is engaged in a merger or acquisition and 0 otherwise; *CROSS* is a dummy variable which equals 1 when a firm is cross-listed in the US and other areas and 0 otherwise; *FDI* is foreign direct investment scaled by GDP; *MCAP* is the ratio of stock market capitalization to GDP; *LNGDP* is the natural log of gross domestic product (GDP) per capita in thousands of US dollars; *RL* refers to rule of law; *CORRUPTION* is the corruption index in a country. ***, **, and * represent significance at 1%, 5%, and 10% levels.

increases exceeds the magnitude of rise in audit fees when uncertainty decreases. The above results suggest that Big 4 auditors adjust audit fees symmetrically as economic policy uncertainty changes, while non-Big 4 auditors perform asymmetric audit pricing. This distinction in audit pricing will enable Big 4 auditors to earn more revenues than non-Big 4 auditors and further widen the gaps between Big 4 auditors and non-Big 4 auditors in other aspects. As a result, Big 4 auditors could develop in a sustainable and competitive manner, while non-Big 4 auditors keep falling behind. These findings increase our understanding of why Big 4 auditors maintain a dominant position in the audit market.

In addition, the results for control variables are consistent with our expectations. For instance, the coefficients on firm size (*LNAT*), business segments (*NBS*), leverage (*LEV*), and audit problems (*OPINION*) are all significantly positive, suggesting that firms with larger size, more business segments, higher leverage and more audit problems pay higher audit fees. Consistent with the findings of previous research (Choi et al., 2009; Kim et al., 2012), we find that the coefficients on net loss (*LOSS*), special items (*SPECIAL*), mergers and acquisitions (*MERGE*), and cross-listing (*CROSS*) are significantly positive, implying that auditors charge higher audit fees to firms with net loss and special items and firms engaged in M&A and cross-listing. In addition, the coefficients on profitability (*ROA*) and current ratio (*LIQUIDITY*) are significantly negative, indicating that firms with higher profitability and current ratio pay lower audit fees. Country, industry, and year dummies are included in the regressions. However, for the sake of brevity, they are not tabulated.

6 | ROBUSTNESS TESTS AND ADDITIONAL TESTS

6.1 | Robustness tests

To confirm the robustness and reliability of our results, we conduct the following robustness checks. First, we exclude US firms from our sample and re-estimate the models. As shown in Table 1, Panel A, US firms represent more than 58 percent of our sample (44,227 of the 75,910 observations); thus, our results may be driven by US firms. Therefore, we drop the US firms and check whether our results still hold. Second, we exclude firms with less than 3 firm-year observations. By dropping these firms, survivorship bias is alleviated, and we can better identify the impact of economic policy uncertainty on audit fees.

Table 4 reports the empirical results of robustness tests for the influence of economic policy uncertainty on audit fees. As shown in Table 4, our results still hold, with a significantly negative coefficient on economic policy uncertainty (*LNEPU*), which suggests that auditors will reduce audit fees when economic policy uncertainty increases.

TABLE 4 Robust checks: Economic policy uncertainty and audit fees

	(1) Excluding USA	(2) Excluding ≤3 observations
LNEPU	−0.2538	−0.2081
	(−4.38)***	(−4.04)***
LNAT	0.5525	0.5303
	(91.15)***	(105.03)***
NBS	0.3233	0.3149
	(15.20)***	(28.12)***
ROA	−0.6253	−0.6227
	(−7.77)***	(−22.97)***
LOSS	0.0069	0.0508
	(0.42)	(4.12)***
SPECIAL	0.2517	0.2620
	(6.61)***	(7.04)***
LEV	0.1185	0.0850
	(7.54)***	(16.26)***
MB	0.0101	0.0045
	(6.25)***	(5.02)***
CURRENT	0.3275	0.3162
	(11.26)***	(22.82)***
LIQUIDITY	−0.0137	−0.0190
	(−11.04)***	(−12.59)***
BIG4	0.3185	0.3067
	(8.77)***	(17.18)***
OPINION	0.1816	0.1405
	(6.99)***	(9.16)***
MERGE	0.1921	0.1369
	(14.73)***	(17.70)***
CROSS	0.5494	0.6597
	(14.24)***	(17.43)***
FDI	1.0443	0.4122
	(1.83)*	(0.57)
MCAP	0.0600	0.0248
	(2.17)**	(1.69)*
LNGDP	0.0272	0.0368
	(0.31)	(0.36)
CONSTANT	−2.7686	−0.4111
	(−3.63)***	(−0.36)
COUNTRY	Control	Control
INDUSTRY	Control	Control
YEAR	Control	Control

(Continues)

TABLE 4 (Continued)

	(1) Excluding USA	(2) Excluding ≤3 observations
Observations	31,683	68,665
Adjusted R^2	0.8455	0.8662

Notes: This table reports the robustness test results for the relationship between economic policy uncertainty and audit fees. In Column (1), US firms are excluded from the sample; in Column (2), firms with less than 3 firm-year observations are dropped from the sample. The dependent variable is audit fees (*LNAF*), which equals the natural log of audit fees in thousands of dollars; *LNEPU* is the natural log of economic policy uncertainty index; *LNAT* is the natural log of total assets in thousands of dollars; *NBS* is the natural log of the number of business segments plus 1; *ROA* is the return on total assets; *LOSS* is a dummy variable which equals 1 when a firm reports a net loss and 0 otherwise; *SPECIAL* is a dummy variable which equals 1 if a firm reports special items and 0 otherwise; *LEV* is the ratio of total liabilities to total assets; *MB* is firm market value divided by the common shareholder equity; *CURRENT* is current assets minus cash scaled by total assets; *LIQUIDITY* is equal to current assets divided by current liabilities; *BIG4* is a dummy variable which equals 1 when a firm is audited by one of the Big 4/6 auditors and 0 otherwise; *OPINION* is a dummy variable which equals 1 when a firm receives modified audit opinions and 0 otherwise; *MERGE* is a dummy variable which equals 1 if a firm is engaged in a merger or acquisition and 0 otherwise; *CROSS* is a dummy variable which equals 1 when a firm is cross-listed in the US and other areas and 0 otherwise; *FDI* is foreign direct investment scaled by GDP; *MCAP* is the ratio of stock market capitalization to GDP; *LNGDP* is the natural log of gross domestic product (GDP) per capita in thousands of US dollars; *RL* refers to rule of law; *CORRUPTION* is the corruption index in a country. ***, **, and * represent significance at 1%, 5%, and 10% levels.

Table 5 shows the results of robustness tests for our hypothesis. The coefficient estimates in Table 5 are consistent with those in Table 3, with the coefficient on *LNEPU * DUM* significantly negative in the subsample of non-Big 4 auditors but not significant in the subsample of Big 4 auditors. These results again support our previous finding that Big 4 auditors adjust audit fees symmetrically as economic policy uncertainty changes, while non-Big 4 auditors perform asymmetric audit pricing.

6.2 | Additional tests

6.2.1 | Big 4 market power and asymmetric audit pricing

To get a better understanding of the asymmetric audit pricing of non-Big 4 auditors, we investigate whether the market power of Big 4 auditors in domestic markets influences the pricing pattern of non-Big 4 auditors. We anticipate that in markets where Big 4 auditors occupy higher market shares, non-Big 4 auditors suffer higher competition pressure from Big 4 auditors, and thus are more likely to adjust audit pricing in an asymmetric way. To test this conjecture, we split the full sample into two subsamples based on the market share of Big 4 auditors, and rerun model (1). Specifically, we include observations in the High Big-4 Market Power subsample if the Big-4 market share measured based on the total assets of clients in a country is above the median value of full sample, and include observations in the Low Big-4 Market Power subsample otherwise.

Table 6 reports the results of model (1) using the subsamples defined above. As shown in Table 6, the coefficient on the interaction term *LNEPU * DUM* is significantly negative in the High Big-4 Market Power subsample, but is insignificant in the Low Big-4 Market Power subsample. The results indicate that the asymmetric adjustment of audit pricing for non-Big 4 auditors mainly exists in markets where Big 4 auditors occupy greater market share, which is consistent with the competition pressure hypothesis.

6.2.2 | Audit quality

Regulators have expressed concerns that reduced audit fees might threaten audit quality because fee concessions made by auditors will limit the resources required to increase audit effort and, thus, audit quality will be compromised (Ettredge et al., 2014). Because we have found in our previous analysis that audit fees decrease with increasing economic policy uncertainty, we wonder whether audit quality will be damaged when economic policy uncertainty increases and whether there are differences in this effect between Big 4 and non-Big 4 auditors. Therefore,

TABLE 5 Robust checks: Economic policy uncertainty and audit fees asymmetry

	(1) Excluding USA		(2) Excluding ≤3 observations	
	Big4	Non-Big4	Big4	Non-Big4
LNEPU	−0.3147	−0.2125	−0.2262	−0.1630
	(−3.26)***	(−2.27)**	(−2.91)***	(−2.34)**
*LNEPU * DUM*	−0.0135	−0.2304	−0.0420	−0.1231
	(−0.21)	(−3.83)***	(−0.77)	(−2.31)**
DUM	0.1127	1.2673	0.2285	0.6849
	(0.34)	(3.99)***	(0.86)	(2.55)**
LNAT	0.5626	0.5505	0.5258	0.5364
	(70.28)***	(71.43)***	(77.26)***	(80.94)***
NBS	0.3376	0.2788	0.3250	0.2650
	(16.92)***	(6.70)***	(31.73)***	(10.86)***
ROA	−0.6606	−0.4939	−0.6115	−0.6009
	(−8.56)***	(−2.79)***	(−16.13)***	(−11.42)***
LOSS	0.0736	−0.0202	0.0796	0.0210
	(3.19)***	(−0.87)	(8.49)***	(0.86)
SPECIAL	0.1285	0.2612	0.1283	0.2754
	(4.78)***	(6.34)***	(4.38)***	(6.21)***
LEV	0.1513	0.1078	0.1640	0.0857
	(7.87)***	(5.28)***	(10.27)***	(16.47)***
MB	0.0046	0.0117	0.0034	0.0052
	(2.99)***	(7.32)***	(4.25)***	(4.63)***
CURRENT	0.5095	0.2341	0.4170	0.2010
	(10.42)***	(7.77)***	(14.85)***	(8.64)***
LIQUIDITY	−0.0153	−0.0141	−0.0219	−0.0162
	(−6.34)***	(−7.24)***	(−9.81)***	(−10.34)***
OPINION	0.0899	0.1689	0.0832	0.1698
	(3.17)***	(6.00)***	(8.05)***	(7.23)***
MERGE	0.1834	0.1916	0.1357	0.1359
	(10.32)***	(7.47)***	(14.73)***	(8.65)***
CROSS	0.4852	0.6454	0.6207	0.7044
	(12.35)***	(5.62)***	(14.25)***	(5.21)***
FDI	0.2825	0.4076	−0.3622	0.3368
	(0.43)	(0.48)	(−0.52)	(0.38)
MCAP	0.0727	0.1870	0.0352	0.0495
	(2.70)***	(4.68)***	(2.95)***	(2.81)***
LNGDP	0.2372	−0.1608	0.3847	−0.0516
	(2.38)**	(−1.54)	(3.62)***	(−0.61)
CONSTANT	−2.8166	−1.6831	−3.6650	0.2044
	(−3.42)***	(−1.60)	(−3.08)***	(0.22)
COUNTRY	Control	Control	Control	Control
INDUSTRY	Control	Control	Control	Control

(Continues)

TABLE 5 (Continued)

	(1) Excluding USA		(2) Excluding ≤3 observations	
	Big4	Non-Big4	Big4	Non-Big4
YEAR	Control	Control	Control	Control
Observations	9,125	12,587	25,803	20,850
Adjusted R^2	0.7826	0.7815	0.7873	0.7965

Notes: This table reports the robustness test results for the hypothesis that Big 4 auditors are better able to recover the loss from reduced audit fees when economic policy uncertainty decreases. In Column (1), US firms are excluded from the sample; in Column (2), firms with less than 3 firm-year observations are dropped from the sample. The dependent variable is audit fees (*LNAF*), which equals the natural log of audit fees in thousands of dollars; *LNEPU* is the natural log of economic policy uncertainty index; *DUM* is a dummy variable that equals 1 if *LNEPU* of this year is larger than the maximum value of the last two years and 0 otherwise; *LNAT* is the natural log of total assets in thousands of dollars; *NBS* is the natural log of the number of business segments plus 1; *ROA* is the return on total assets; *LOSS* is a dummy variable which equals 1 when a firm reports a net loss and 0 otherwise; *SPECIAL* is a dummy variable which equals 1 if a firm reports special items and 0 otherwise; *LEV* is the ratio of total liabilities to total assets; *MB* is firm market value divided by the common shareholder equity; *CURRENT* is current assets minus cash scaled by total assets; *LIQUIDITY* is equal to current assets divided by current liabilities; *BIG4* is a dummy variable which equals 1 when a firm is audited by one of the Big 4/6 auditors and 0 otherwise; *OPINION* is a dummy variable which equals 1 when a firm receives modified audit opinions and 0 otherwise; *MERGE* is a dummy variable which equals 1 if a firm is engaged in a merger or acquisition and 0 otherwise; *CROSS* is a dummy variable which equals 1 when a firm is cross-listed in the US and other areas and 0 otherwise; *FDI* is foreign direct investment scaled by GDP; *MCAP* is the ratio of stock market capitalization to GDP; *LNGDP* is the natural log of gross domestic product (GDP) per capita in thousands of US dollars; *RL* refers to rule of law; *CORRUPTION* is the corruption index in a country. ***, **, and * represent significance at 1%, 5%, and 10% levels.

in the additional test, we further investigate the impact of economic policy uncertainty on audit quality by running the following regression:

$$\begin{aligned} OPINION = {} & \beta_0 + \beta_1 LNEPU + \beta_2 LNAT + \beta_3 LOSS + \beta_4 LIQUIDITY + \beta_5 LEV + \beta_6 ROA + \beta_7 TURNOVER + \beta_8 MB \\ & + \beta_9 CASHFLOW + \beta_{10} BIG4 + \beta_{11} MCAP + \beta_{12} RL + \beta_{13} CORRUPTION + \sum COUNTRY \\ & + \sum INDUSTRY + \sum YEAR + \varepsilon \end{aligned} \quad (2)$$

In model (2), the dependent variable is audit opinion (*OPINION*), which is a dummy variable that equals 1 when a firm receives modified audit opinions and 0 otherwise. The independent variable of interest in model (2) is *LNEPU*, which equals the natural log of the EPU index, and we use it as a proxy for the level of economic environment. In addition, we include the following control variables based on prior literature. We control for firm size (*LNAT*) because larger firms may have more developed internal control systems to guarantee the quality of accounting information (Newton, Wang, & Wilkins, 2013; Sharma & Sidhu, 2001), and we expect a positive coefficient on it. We include several proxies for financial conditions (*LOSS*, *LIQUIDITY*, and *LEV*). Prior literature suggests that companies that are in financial distress or are highly leveraged are more likely to engage in earnings management and, therefore, damage audit quality (Ettredge et al., 2014; Kausar & Lennox, 2017). The return on total assets (*ROA*) and the ratio of sales to total assets (*TURNOVER*) are included in the model to control for profitability. We also include book-to-market (*MB*) ratio and cash flow from operations to total assets (*CASHFLOW*) as control variables because higher book-to-market ratio and low cash flow denote higher audit risk (Fama & French, 1995; Khurana & Raman, 2004). The *BIG4* indicator is included as a control variable because Big 4 auditors are perceived to provide audits of higher quality (Francis & Yu, 2009). In addition, we control for three country-level variables, *MCAP*, *RL*, and *CORRUPTION* (Fung, Gul, Raman, & Zhu, 2012). *MCAP* is the ratio of stock market capitalization to GDP; we use it as a proxy for a country's financial development. *RL* refers to the rule of law, which measures "the perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann, Kraay, & Mastruzzi, 2009). *CORRUPTION* is the corruption index obtained from the World Bank website. We expect lower audit quality in countries where the corruption index is high (Leuz, Nanda, & Wysocki, 2003).

TABLE 6 Big 4 market power and asymmetric audit pricing of non-Big 4 auditors

	(1) High Big-4 Market Power	(2) Low Big-4 Market Power
LNEPU	−0.0186	−0.1288
	(−0.33)	(−1.00)
*LNEPU * DUM*	−0.0949	−0.1651
	(−3.20)***	(−1.61)
DUM	0.5023	0.8798
	(3.24)***	(1.67)
LNAT	0.5051	0.5733
	(64.98)***	(80.06)***
NBS	0.2251	0.3762
	(10.77)***	(8.36)***
ROA	−0.6004	0.7607
	(−11.16)***	(5.88)***
LOSS	0.0605	0.0798
	(2.87)***	(3.23)***
SPECIAL	0.1148	0.3136
	(5.67)***	(7.56)***
LEV	0.0692	0.0429
	(13.48)***	(1.10)
MB	0.0016	0.0149
	(2.79)***	(5.65)***
CURRENT	0.1958	0.2109
	(6.91)***	(5.90)***
LIQUIDITY	−0.0186	−0.0136
	(−15.13)***	(−4.10)***
OPINION	0.1101	0.1768
	(3.32)***	(5.87)***
MERGE	0.1208	0.2084
	(12.51)***	(4.72)***
CROSS	0.3257	0.7832
	(1.61)	(9.55)***
FDI	−0.4312	−2.1645
	(−1.11)	(−1.19)
MCAP	−0.0173	−0.1394
	(−1.37)	(−1.33)
LNGDP	1.1680	−0.2847
	(8.73)***	(−2.47)**
CONSTANT	−13.1629	−1.4769
	(−8.42)***	(−1.20)
COUNTRY	Control	Control
INDUSTRY	Control	Control
YEAR	Control	Control

(Continues)

TABLE 6 (Continued)

	(1) High Big-4 Market Power	(2) Low Big-4 Market Power
Observations	14,115	9,147
Adjusted R^2	0.6988	0.7916

Notes: This table tests the pricing pattern of non-Big 4 auditors under different market conditions. Observations are included in the High Big-4 Market Power subsample (Column (1)) if the Big-4 market share measured based on the total assets of clients in a country is above the median value of the full sample, and include observations in the Low Big-4 Market Power subsample otherwise (Column (2)). The dependent variable is audit fees (*LNAF*), which equals the natural log of audit fees in thousands of dollars; *LNEPU* is the natural log of economic policy uncertainty index; *DUM* is a dummy variable that equals 1 if *LNEPU* of this year is larger than the maximum value of the last two years and 0 otherwise; *LNAT* is the natural log of total assets in thousands of dollars; *NBS* is the natural log of the number of business segments plus 1; *ROA* is the return on total assets; *LOSS* is a dummy variable which equals 1 when a firm reports a net loss and 0 otherwise; *SPECIAL* is a dummy variable which equals 1 if a firm reports special items and 0 otherwise; *LEV* is the ratio of total liabilities to total assets; *MB* is firm market value divided by the common shareholder equity; *CURRENT* is current assets minus cash scaled by total assets; *LIQUIDITY* is equal to current assets divided by current liabilities; *BIG4* is a dummy variable which equals 1 when a firm is audited by one of the Big 4/6 auditors and 0 otherwise; *OPINION* is a dummy variable which equals 1 when a firm receives modified audit opinions and 0 otherwise; *MERGE* is a dummy variable which equals 1 if a firm is engaged in a merger or acquisition and 0 otherwise; *CROSS* is a dummy variable which equals 1 when a firm is cross-listed in the US and other areas and 0 otherwise; *FDI* is foreign direct investment scaled by GDP; *MCAP* is the ratio of stock market capitalization to GDP; *LNGDP* is the natural log of gross domestic product (GDP) per capita in thousands of US dollars; *RL* refers to rule of law; *CORRUPTION* is the corruption index in a country. ***, **, and * represent significance at 1%, 5%, and 10% levels.

Table 7 reports the results for model (2) with *OPINION* as the dependent variable. Columns (1), (2), and (3) present the estimates for the full sample, Big 4 auditor subsample, and non-Big 4 auditor subsample, respectively. As shown in Table 7, all the coefficients on *LNEPU* are significantly positive, suggesting that more modified audit opinions are issued as the economic policy uncertainty increases. Columns (2) and (3) show that the coefficient on *LNEPU* in the subsample of Big 4 auditors is larger than that in the subsample of non-Big 4 auditors, and the *F*-test shows that the difference is significant at the 1 percent level. This result reveals that compared with non-Big 4 auditors, Big 4 auditors issue more modified audit opinions when economic policy uncertainty increases. This evidence suggests that although both Big 4 and non-Big 4 auditors reduce audit fees in uncertain years, Big 4 auditors perform audits of higher quality. Under this circumstance, firms are more likely to choose Big 4 auditors when they take both price factors and quality factors into account.

To check the robustness of the results in Table 7, we rerun model (2) by using performance-adjusted discretionary accrual (*DA*) as an alternative measure of audit quality (Chen, Dai, Kong, & Tan, 2017; Ghosh, Marra, & Moon, 2010; Knechel, Sharma, & Sharma, 2012; Kothari, Leone, & Wasley, 2005). Table 8 reports the empirical results. In Table 8, columns (1), (2) present the estimates for the Big 4 auditor subsample and non-Big 4 auditor subsample, respectively. As shown in Table 8, the coefficient on *LNEPU* remains significantly positive for non-Big 4 auditors, but is insignificant for Big 4 auditors, indicating that Big 4 auditors offer higher quality audits than non-Big 4 auditors when economic policy uncertainty increases, which is consistent with the findings in Table 7.

6.2.3 | Flow of clients

To gain further insights into how Big 4 auditors take advantage of audit pricing to gain a competitive advantage, we provide evidence on the flow of clients and characteristics of clients switching from non-Big 4 (Big 4) to Big 4 (non-Big 4) auditors under different economic policy uncertainty conditions. Table 9, Panel A shows the number and percentage of clients switching from non-Big 4 (Big 4) auditors to Big 4 (non-Big 4) auditors when economic policy uncertainty increases or decreases. We can see from Panel A that in uncertain years (when economic policy uncertainty increases), 53.08 percent of firms switch from non-Big 4 auditors to Big 4 auditors, while only 29.21 percent of firms switch from Big 4 auditors to non-Big 4 auditors. Table 9, Panel B shows the financial condition of firms switching from non-Big 4 (Big 4) auditors to Big 4 (non-Big 4) auditors. The analysis of the full sample provides overall evidence that firms with better profitability (*ROA*), higher growth (*SALEGROWTH*), more cash flow (*CASHFLOW*), lower leverage

TABLE 7 Economic policy uncertainty and audit opinion

Panel A. Baseline model			
	(1) All Sample	(2) Big4	(3) Non-Big4
LNEPU	1.7666	2.6372	1.0548
	(17.57)***	(20.12)***	(8.03)***
LNAT	0.1172	0.1338	0.0973
	(25.55)***	(32.64)***	(5.96)**
LOSS	0.1190	0.1982	0.0928
	(6.00)**	(8.74)***	(4.13)**
LIQUIDITY	−0.0538	−0.0588	−0.0527
	(61.78)***	(36.40)***	(89.01)***
LEV	0.5382	0.5118	0.5173
	(141.48)***	(71.59)***	(163.93)***
ROA	−1.4586	−0.5956	−2.1605
	(26.79)***	(1.59)	(174.45)***
TURNOVER	−0.1312	−0.0584	−0.1643
	(29.59)***	(5.24)***	(35.15)***
MB	0.0008	−0.0004	0.0002
	(0.27)	(0.02)	(0.01)
CASHFLOW	−0.7017	−0.7854	−0.6269
	(25.69)***	(7.76)***	(15.61)***
BIG4	0.0648		
	(0.26)		
MCAP	0.3354	0.3895	0.0767
	(4.80)**	(4.43)**	(0.32)
RL	−5.3017	−5.1174	−3.1581
	(27.49)***	(23.79)***	(13.59)***
CORRUPTION	0.4943	0.0032	0.5634
	(0.67)	(0.00)	(1.10)
CONSTANT	−3.6065	−9.09	−1.8344
	(1.52)	(6.73)***	(0.43)
COUNTRY	Control	Control	Control
INDUSTRY	Control	Control	Control
YEAR	Control	Control	Control
F statistic for $LNEPU_{big4}$-$LNEPU_{nonbig4} = 0$		91.30	
(*p*-value)		(0.00)	
Observations	76,195	41,401	34,794
Psuedo R^2	0.3085	0.3903	0.2965

Panel B. Robust checks				
	(1) Excluding USA		(2) Excluding ≤3 observations	
	Big4	Non-Big4	Big4	Non-Big4
LNEPU	1.5432	−0.7228	2.4311	1.0408
	(17.45)***	(3.26)*	(18.85)***	(8.23)***

(Continues)

TABLE 7 (Continued)

Panel B. Robust checks	(1) Excluding USA		(2) Excluding ≤3 observations	
	Big4	Non-Big4	Big4	Non-Big4
LNAT	0.0449	0.1918	0.1408	0.1232
	(1.85)	(22.19)***	(42.98)***	(11.13)***
LOSS	0.4558	0.2033	0.2119	0.0953
	(20.47)***	(10.74)***	(8.93)***	(4.22)**
LIQUIDITY	−0.0514	−0.0391	−0.0594	−0.0511
	(11.55)***	(47.23)***	(34.79)***	(102.40)***
LEV	0.3127	0.2638	0.4453	0.5254
	(22.05)***	(21.08)***	(64.25)***	(121.63)***
ROA	−2.5833	−1.7639	−0.4760	−2.1623
	(42.79)***	(44.90)***	(0.95)	(167.67)***
TURNOVER	−0.1419	−0.1542	−0.0568	−0.1572
	(3.46)*	(18.39)***	(5.00)**	(28.53)***
MB	0.0033	0.0020	0.0002	0.0006
	(0.42)	(0.25)	(0.00)	(0.07)
CASHFLOW	−1.1631	−0.6107	−0.7990	−0.6609
	(7.03)***	(6.60)**	(8.25)***	(15.94)***
MCAP	0.3248	−0.3580	0.3284	0.0732
	(3.18)*	(4.38)**	(3.45)*	(0.30)
RL	−0.5827	1.1289	−5.7369	−3.4235
	(0.28)	(2.23)	(27.17)***	(16.21)***
CORRUPTION	0.0662	1.4530	0.0574	0.4346
	(0.01)	(4.63)**	(0.00)	(0.59)
CONSTANT	−6.5074	4.7709	−7.3874	−1.5716
	(9.57)***	(4.83)**	(4.37)**	(0.33)
COUNTRY	Control	Control	Control	Control
INDUSTRY	Control	Control	Control	Control
YEAR	Control	Control	Control	Control
F statistic for $LNEPU_{big4} - LNEPU_{nonbig4} = 0$	91.27		61.20	
(*p*-value)	(0.00)		(0.00)	
Observations	13,048	18,755	37,946	31,037
Psuedo R^2	0.4687	0.2931	0.3984	0.2927

Notes: This table tests the impact of economic policy uncertainty on audit quality measured as audit opinions. Panel A provides the baseline model results, and Panel B shows the robustness results by excluding US firms/firms with less than 3 observations during the sample period from the full sample. The dependent variable is audit opinion (*OPINION*), which is a dummy variable that equals 1 when a firm receives modified audit opinions and 0 otherwise; *LNEPU* is the natural log of economic policy uncertainty index; *LNAT* is the natural log of total assets in thousands of dollars; *LOSS* is a dummy variable which equals 1 when a firm reports a net loss and 0 otherwise; *LIQUIDITY* is equal to current assets divided by current liabilities; *LEV* is the ratio of total liabilities to total assets; *ROA* is the return on total assets; *TURNOVER* is the ratio of sales to total assets; *MB* is firm market value divided by the common shareholder equity; *CASHFLOW* is the ratio of cash flow from operations to total assets; *MCAP* is the ratio of stock market capitalization to GDP; *RL* refers to rule of law; *CORRUPTION* is the corruption index in a country. ***, **, and * represent significance at 1%, 5%, and 10% levels.

TABLE 8 Economic policy uncertainty and discretional accruals

	Big4	Non-Big4
LNEPU	0.1050	0.5328
	(0.83)	(2.59)**
LNAT	0.0010	−0.0547
	(0.10)	(−3.18)***
LOSS	−0.0466	−0.1974
	(−1.02)	(−4.61)***
LIQUIDITY	0.0004	−0.0007
	(0.04)	(−0.13)
LEV	−0.0260	−0.0633
	(−0.39)	(−3.01)***
ROA	0.3345	0.3989
	(1.98)*	(2.31)**
TURNOVER	0.0052	0.0065
	(0.13)	(0.18)
MB	−0.0014	0.0017
	(−0.58)	(0.63)
CASHFLOW	−0.8807	−0.6832
	(−4.80)***	(−2.77)***
MCAP	0.0394	0.1627
	(0.90)	(2.61)**
RL	0.1188	1.0916
	(0.20)	(2.12)**
CORRUPTION	−0.1895	−0.2994
	(−1.08)	(−0.92)
CONSTANT	1.5121	−3.0521
	(0.73)	(−2.31)**
COUNTRY	Control	Control
INDUSTRY	Control	Control
YEAR	Control	Control
Observations	37,302	30,418
Adjusted R^2	0.0370	0.0181

Notes: This table tests the impact of economic policy uncertainty on audit quality measured as performance-adjusted discretionary accruals. The dependent variable is performance-adjusted discretionary accrual (*DA*), which is a dummy variable that equals 1 when a firm receives modified audit opinions and 0 otherwise; *LNEPU* is the natural log of economic policy uncertainty index; *LNAT* is the natural log of total assets in thousands of dollars; *LOSS* is a dummy variable which equals 1 when a firm reports a net loss and 0 otherwise; *LIQUIDITY* is equal to current assets divided by current liabilities; *LEV* is the ratio of total liabilities to total assets; *ROA* is the return on total assets; *TURNOVER* is the ratio of sales to total assets; *MB* is firm market value divided by the common shareholder equity; *CASHFLOW* is the ratio of cash flow from operations to total assets; *MCAP* is the ratio of stock market capitalization to GDP; *RL* refers to rule of law; *CORRUPTION* is the corruption index in a country. ***, **, and * represent significance at 1%, 5%, and 10% levels.

(*LEV*), and larger size (*LNTA*) tend to switch from non-Big 4 auditors to Big 4 auditors. Further evidence shows that in uncertain years, Big 4 auditors reduce audits fees, maintain the high quality of their audits, and attract high-quality clients. As a whole, the above descriptive analysis implies that Big 4 auditors attract more new clients than non-Big 4 auditors in years of uncertainty and that the attracted clients are of high quality.

TABLE 9 Flow of clients

Panel A. Auditor change and economic policy uncertainty				
	From Non-Big4 to Big4		From Big4 to Non-Big4	
	No. of observations	Percentage	No. of observations	Percentage
Certain year	427	46.92%	1001	70.79%
Uncertain year	483	53.08%	413	29.21%
Total	910	100%	1414	100%

Panel B. Auditor change and firms' financial condition						
(1) Full Sample						
	From Non-Big4 to Big4		From Big4 to Non-Big4		Test of Difference (*p*-value)	
Financial condition	Mean	Median	Mean	Median	Mean	Median
ROA	0.0075	0.0417	−0.0149	0.0293	0.0013	0.0034
LOSS	0.4121	0.0000	0.4505	0.0000	0.0678	0.0685
CASHFLOW	0.0244	0.0511	0.0087	0.0454	0.0191	0.1753
LEV	0.5421	0.5081	0.5826	0.4983	0.0790	0.6184
SALEGROWTH	0.2820	0.0755	0.1305	0.0522	0.0000	0.0000
LNTA	12.2992	12.1029	11.7481	11.5785	0.0000	0.0000
(2) Uncertain Years						
	From Non-Big4 to Big4		From Big4 to Non-Big4		Test of Difference (*p*-value)	
Financial condition	Mean	Median	Mean	Median	Mean	Median
ROA	0.0135	0.0445	−0.0201	0.0226	0.0024	0.0021
LOSS	0.4037	0.0000	0.4915	0.0000	0.0084	0.0086
CASHFLOW	0.0321	0.0517	0.0036	0.0442	0.0074	0.0770
LEV	0.5496	0.5207	0.6042	0.5287	0.1718	0.2640
SALEGROWTH	0.2505	0.0594	0.0686	0.0259	0.0006	0.0000
LNTA	12.4347	12.1695	12.0995	11.8247	0.0230	0.0066
(3) Certain Years						
	From Non-Big4 to Big4		From Big4 to Non-Big4		Test of Difference (*p*-value)	
Financial condition	Mean	Median	Mean	Median	Mean	Median
ROA	0.0008	0.0382	−0.0127	0.0318	0.1502	0.2483
LOSS	0.4215	0.0000	0.4336	0.0000	0.6744	0.6747
CASHFLOW	0.0158	0.0489	0.0108	0.0469	0.5839	0.8481
LEV	0.5336	0.4981	0.5736	0.4910	0.1702	0.6843
SALEGROWTH	0.3181	0.0939	0.1552	0.0600	0.0041	0.0081
LNTA	12.1489	12.0116	11.6034	11.4799	0.0000	0.0000

Notes: If the economic policy uncertainty index is larger than the mean value of the full sample, then it falls into the group of uncertain year, otherwise, it is classified as a certain year. Panel A shows the number and percentage of clients switching from non-Big 4 (Big 4) auditors to Big 4 (non-Big 4) auditors when economic policy uncertainty increases or decreases. Panel B shows the financial condition of firms switching from non-Big 4 (Big 4) auditors to Big 4 (non-Big 4) auditors.

7 | CONCLUSION

Regulators have expressed concerns about the high concentration of Big 4 auditors in the audit market and its potential detrimental consequences on audit quality. Prior research devotes significant efforts to understand the establishment of Big 4 auditors' market dominant position, but there is limited evidence on how Big 4 auditors reinforce their

advantage over non-Big 4 auditors through audit pricing. This paper seeks a deeper understanding of this research question by investigating the relationship between economic policy uncertainty and audit fees. Our study finds that non-Big 4 auditors adjust audit pricing asymmetrically as economic policy uncertainty changes, i.e., the magnitude of decline in audit fees when economic policy uncertainty increases exceeds the magnitude of rise when economic policy uncertainty decreases, while Big 4 auditors regulate their audit pricing in a symmetric manner. Further analyses reveal that Big 4 auditors provide higher quality audits and that firms in better financial condition turn to Big 4 auditors in uncertain years. Our study not only enriches the extant literature on the determinants of audit fees but also has policy implications for regulators to cope with Big 4 auditors' overwhelming power in the audit market.

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REFERENCES

Arrow, K. J. (1959). Towards a theory of price adjustment. In *The Allocation of Economic Resources* (pp. 41–51). Stanford, CA: Stanford University Press.

Ashbaugh, H., LaFond, R., & Mayhew, B. W. (2003). Do non-audit services compromise auditor independence? Further evidence. *The Accounting Review*, *78*, 611–639.

Baker, S. R., Bloom, N., & Davis, S. J. (2013). *Measuring economic policy uncertainty*. Working paper.

Basioudis, I. G. (2007). Auditor's engagement risk and audit fees: The role of audit firm Alumni. *Journal of Business Finance & Accounting*, *34*, 1393–1422.

Beattie, V., & Fearnley, S. (1995). The importance of audit firm characteristics and the drivers of auditor change in UK listed companies. *Accounting and Business Research*, *25*, 227–239.

Beattie, V., Goodacre, A., & Fearnley, S. (2003). And then there were four: A study of UK market concentration—causes, consequences and the scope for market adjustment. *Journal of Financial Regulation and Compliance*, *11*, 250–265.

Beck, M. J., & Mauldin, E. G. (2014). Who's really in charge? Audit committee versus CFO power and audit fees. *The Accounting Review*, *89*, 2057–2085.

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

Behn, B., Choi, J. H., & Kang, T. (2008). Audit quality and properties of analyst earnings forecasts. *The Accounting Review*, *83*, 327–359.

Bell, T. B., Landsman, W. R., & Shackelford, D. A. (2001). Auditors' perceived business risk and audit fees: Analysis and evidence. *Journal of Accounting Research*, *39*, 35–43.

Bitner, M. J. (1990). Evaluating service encounters: The effects of physical surroundings and employee responses. *Journal of Marketing*, *54*, 69–82.

Boero, G., Smith, J., & Wallis, K. F. (2008). Uncertainty and disagreement in economic prediction. *Economic Journal*, *118*, 1107–1127.

Bomberger, W. A. (1996). Disagreement as a measure of uncertainty. *Journal of Money, Credit and Banking*, *28*, 381–392.

Boone, J. P., Khurana, I. K., & Raman, K. K. (2012). Audit market concentration and auditor tolerance for earnings management. *Contemporary Accounting Research*, *29*, 1171–1203.

Boone, J. P., Khurana, I. K., & Raman, K. K. (2014). Did the 2007 PCAOB disciplinary order against Deloitte impose actual costs on the firm or improve its audit quality? *The Accounting Review*, *90*, 405–441.

Boulding, W., Kalra, A., Staelin, R., & Zeithaml, V. A. (1993). A dynamic process model of service quality: From expectations to behavioral intentions. *Journal of Marketing Research*, *30*, 7–27.

Campello, M., Graham, J. R., & Harvey, C. R. (2010). The real effects of financial constraints: Evidence from a financial crisis. *Journal of Financial Economics*, *97*, 470–487.

Cassell, C. A., Giroux, G., Myers, L. A., & Omer, T. C. (2013). The emergence of second-tier auditors in the US: Evidence from investor perceptions of financial reporting credibility. *Journal of Business Finance & Accounting*, *40*, 350–372.

Cheffers, M., & Whalen, D. (2011). Audit fees and non-audit fees: An eight year trend. *Audit Analytics*, (May). http://www.auditanalytics.com/0002/view-custom-reports.php?report=686564d890a77e57501235a63454adcd (accessed December 4, 2017).

Chen, X., Dai, Y., Kong, D., & Tan, W. (2017). Effect of international working experience of individual auditors on audit quality: Evidence from China. *Journal of Business Finance & Accounting*, *44*, 1073–1108.

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

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

Christensen, B. E., Omer, T. C., Sharp, N. Y., & Shelley, M. K. (2014). *Pork bellies and public company audits: Have audits once again become just another commodity?* Working paper.

Chung, R., Firth, M., Kim, J. B., & Pang, L. (2014). Big 4 conservatism around the world. In S. Boubaker, & D. Nguyen (Eds.), *Corporate Governance in Emerging Markets* (pp. 197–238). Berlin: Springer.

Cox, C. (2005). Speech by SEC Chairman: Remarks before the 2005 AICPA National Conference on Current SEC and PCAOB Developments. US Securities and Exchange Commission. Retrieved from www.sec.gov/news/speech/spch120505cc.htm (accessed April 24, 2008).

Craswell, A. T., Francis, J. R., & Taylor, S. L. (1995). Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics*, *20*, 297–322.

Cronin, J. J., & Taylor, S. A. (1992). Measuring service quality: A reexamination and extension. *The Journal of Marketing*, *56*, 55–68.

Crosby, L. A., Evans, K. R., & Cowles, D. (1990). Relationship quality in services selling: An interpersonal influence perspective. *The Journal of Marketing*, *54*, 68–81.

De George, E. T., Ferguson, C. B., & Spear, N. A. (2013). How much does IFRS cost? IFRS adoption and audit fees. *The Accounting Review*, *88*, 429–462.

DeAngelo, L. E. (1981). Auditor independence, low balling, and disclosure regulation. *Journal of Accounting and Economics*, *3*, 113–127.

DeFond, M., Erkens, D. H., & Zhang, J. (2017). Do client characteristics really drive the Big N audit quality effect? New evidence from propensity score matching. *Management Science*, *63*, 3628–3649.

DeFond, M. L., Francis, J. R., & Wong, T. J. (2000). Auditor industry specialization and market segmentation: Evidence from Hong Kong. *Auditing: A Journal of Practice and Theory*, *19*, 49–66.

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

Doogar, R., & Easley, R. F. (1998). Concentration without differentiation: A new look at the determinants of audit market concentration. *Journal of Accounting and Economics*, *25*, 235–253.

Dunn, K. A., & Mayhew, B. W. (2004). Audit firm industry specialization and client disclosure quality. *Review of Accounting Studies*, *9*, 35–58.

Dutillieux, W., Stokes, D., & Willekens, M. (2013). Strategic pricing by Big 4 audit firms in private client segments. *Accounting and Finance*, *53*, 961–994.

Ettredge, M., Fuerherm, E. E., & Li, C. (2014). Fee pressure and audit quality. *Accounting, Organizations and Society*, *39*, 247–263.

Fama, E., & French, K. (1995). Size and book-to-market factors in earnings and returns. *The Journal of Finance*, *50*, 131–155.

Ferguson, A., Francis, J. R., & Stokes, D. J. (2006). What matters in audit pricing: Industry specialization or overall market leadership? *Accounting and Finance*, *46*, 97–106.

Francis, B. B., Hasan, I., & Zhu, Y. (2014). Political uncertainty and bank loan contracting. *Journal of Empirical Finance*, *29*, 281–286.

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

Francis, J. R., Maydew, E. L., & Sparks, H. C. (1999). The role of Big 6 auditors in the credible reporting of accruals. *Auditing: A Journal of Practice and Theory*, *18*, 17–34.

Francis, J. R., & Wang, D. (2008). The joint effect of investor protection and Big 4 audits on earnings quality around the world. *Contemporary Accounting Research*, *25*, 157–191.

Francis, J. R., & Yu, M. D. (2009). Big 4 office size and audit quality. *The Accounting Review*, *84*, 1521–1552.

Fung, S., Gul, F. A., Raman, K. K., & Zhu, K. (2012). *Audit market concentration, auditor's reputation as global- and country-level market leader, and investor-perceived audit quality*. Working paper.

Ghosh, A., Marra, A., & Moon, D. (2010). Corporate boards, audit committees, and earnings management: Pre- and Post-SOX evidence. *Journal of Business Finance & Accounting*, *37*, 1145–1176.

Gul, F. A., Wu, D., & Yang, Z. (2013). Do individual auditors affect audit quality? Evidence from archival data. *The Accounting Review*, *88*, 1993–2023.

Gulen, H., & Ion, M. (2015). Policy uncertainty and corporate investment. *The Review of Financial Studies*, *29*, 523–564.

Hackenbrack, K., & Knechel, W. R. (1997). Resource allocation decisions in audit engagements. *Contemporary Accounting Research*, *14*, 481–500.

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

Hogan, C. E., & Wilkins, M. S. (2008). Evidence on the audit risk model: Do auditors increase audit fees in the presence of internal control deficiencies? *Contemporary Accounting Research*, *25*, 219–242.

Hope, O. K., & Langli, J. C. (2010). Auditor independence in a private firm and low litigation risk setting. *The Accounting Review*, *85*, 573–605.

Huang, H. W., Raghunandan, K., Huang, T. C., & Chiou, J. R. (2014). Fee discounting and audit quality following audit firm and audit partner changes: Chinese evidence. *The Accounting Review*, *90*, 1517–1546.

Johnson, W. B., & Lys, T. (1990). The market for audit services: Evidence from voluntary auditor changes. *Journal of Accounting and Economics*, *12*, 281–308.

Karim, A. K. M. (2010). *Audit pricing, audit concentration, and Big-4 premium in Bangladesh*. Working paper.

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2009). *Governance matters VIII: Aggregate and individual governance indicators, 1996–2008*. Working paper.

Kausar, A., & Lennox, C. (2017). Balance sheet conservatism and audit reporting conservatism. *Journal of Business Finance & Accounting*, *44*, 897–924.

Keaveney, S. M. (1995). Customer switching behavior in service industries: An exploratory study. *The Journal of Marketing*, *59*, 71–82.

Khurana, I. K., & Raman, K. K. (2004). Litigation risk and the financial reporting credibility of Big 4 versus Non-Big 4 audits: Evidence from Anglo-American countries. *The Accounting Review*, *79*, 473–495.

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

Knechel, W. R., Naiker, V., & Pacheco, G. (2007). Does auditor industry specialization matter? Evidence from market reaction to auditor switches. *Auditing: A Journal of Practice and Theory*, *26*, 19–45.

Knechel, W. R., & Payne, J. L. (2001). Additional evidence on audit report lag. *Auditing: A Journal of Practice and Theory*, *20*, 137–146.

Knechel, W. R., Sharma, D. S., & Sharma, V. D. (2012). Non-audit services and knowledge spillovers: Evidence from New Zealand. *Journal of Business Finance & Accounting*, *39*, 60–81.

Kothari, S. P., Leone, A. J., & Wasley, C. E. (2005). Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, *39*, 163–197.

Krishnamurthy, S., Zhou, J., & Zhou, N. (2006). Auditor reputation, auditor independence, and the stock-market impact of Andersen's indictment on its client firms. *Contemporary Accounting Research*, *23*, 465–490.

Krishnan, G. (2003). Audit quality and the pricing of discretionary accruals. *Auditing: A Journal of Practice and Theory*, *22*, 109–126.

Krishnan, G. V., & Zhang, Y. (2014). Is there a relation between audit fee cuts during the global financial crisis and banks' financial reporting quality? *Journal of Accounting and Public Policy*, *33*, 279–300.

Kurt, A. C. (2017). How do financial constraints relate to financial reporting quality? Evidence from seasoned equity offerings. *European Accounting Review*, https://doi.org/10.1080/09638180.2017.1279556.

Kwon, S. Y., Lim, Y., & Simnett, R. (2014). The effect of mandatory audit firm rotation on audit quality and audit fees: Empirical evidence from the Korean audit market. *Auditing: A Journal of Practice and Theory*, *33*, 167–196.

Lawrence, A., Minutti-Meza, M., & Zhang, P. (2011). Can Big 4 versus Non-Big 4 differences in audit-quality proxies be attributed to client characteristics? *The Accounting Review*, *86*, 259–286.

Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics*, *69*, 505–527.

Mao, M. Q., & Yu, Y. (2015). Analysts' cash flow forecasts, audit effort, and audit opinions on internal control. *Journal of Business Finance & Accounting*, *42*, 635–664.

Newton, N. J., Wang, D., & Wilkins, M. S. (2013). Does a lack of choice lead to lower quality? Evidence from auditor competition and client restatements. *Auditing: A Journal of Practice and Theory*, *32*, 31–67.

Niemi, L. (2002). Do firms pay for audit risk? Evidence on risk premiums in audit fees after direct control for audit effort. *International Journal of Auditing*, *6*, 37–51.

Numan, W., & Willekens, M. (2012). An empirical test of spatial competition in the audit market. *Journal of Accounting and Economics*, *53*, 450–465.

O'Keefe, T. B., Simunic, D. A., & Stein, M. T. (1994). The production of audit services: Evidence from a major public accounting firm. *Journal of Accounting Research*, *32*, 241–261.

Panousi, V., & Papanikolaou, D. (2012). Investment, idiosyncratic risk, and ownership. *The Journal of Finance*, *67*, 1113–1148.

Sharma, D. S., & Sidhu, J. (2001). Professionalism vs commercialism: The association between non-audit services (NAS) and audit independence. *Journal of Business Finance & Accounting*, *28*, 595–629.

Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. *Journal of Accounting Research*, *18*, 161–190.

Simunic, D. A., & Stein, M. T. (1996). Impact of litigation risk on audit pricing: A review of the economics and the evidence. *Auditing: A Journal of Practice and Theory*, *15*(supplement), 119–134.

Stice, J. D. (1991). Using financial and market information to identify pre-engagement factors associated with lawsuits against auditors. *The Accounting Review*, *66*, 516–533.

Teoh, S., & Wong, T. J. (1993). Perceived audit quality and the earnings response coefficient. *The Accounting Review*, *68*, 346–366.

Venkataraman, R., Weber, J. P., & Willenborg, M. (2008). Litigation risk, audit quality, and audit fees: Evidence from initial public offerings. *The Accounting Review*, *83*, 1315–1345.

Walker, K. B., & Johnson, E. N. (1996). A review and synthesis of research on supplier concentration, quality and fee structure in non-US markets for auditor services. *The International Journal of Accounting*, *31*, 1–18.

Zaman, M., Hudaib, M., & Haniffa, R. (2011). Corporate governance quality, audit fees and non-audit services fees. *Journal of Business Finance & Accounting*, *38*, 165–197.

Zarnowitz, V., & Lambros, L. A. (1987). Consensus and uncertainty in economic prediction. *Journal of Political Economy*, *95*, 591–621.

Zhang, G., Han, J., Pan, Z., & Huang, H. (2015). Economic policy uncertainty and capital structure choice: Evidence from China. *Economic Systems*, *39*, 439–457.

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APPENDIX: VARIABLES, DEFINITIONS AND SOURCES

Variable	Definition	Source
Firm-level variables		
LNAF	Natural log of audit fees in thousands of dollars.	Worldscope
LNEPU	Natural log of economic policy uncertainty index.	Economic Research
DUM	Indicator variable equals 1 when economic policy uncertainty index in current year is greater than the maximum index value in the past two years and 0 otherwise.	Economic Research
LNAT	Natural log of total assets in thousands of dollars.	Worldscope
NBS	Natural log of the number of business segments plus 1.	Worldscope
ROA	The return on total assets.	Compustat
LOSS	Dummy variable, which equals 1 when a firm reports a net loss and 0 otherwise.	Compustat

Variable	Definition	Source
SPECIAL	Dummy variable, which equals 1 if a firm reports special items and 0 otherwise.	Compustat
LEV	Ratio of total liabilities to total assets.	Compustat
MB	Market-to-book ratio, defined as firm market value divided by the common shareholder equity.	Worldscope
CURRENT	Current assets minus cash scaled by total assets.	Compustat
LIQUIDITY	Current ratio, which is equal to current assets divided by current liabilities.	Compustat
BIG4	Dummy variable, which equals 1 when a firm is audited by one of the Big 4/6 auditors and 0 otherwise.	Compustat
OPINION	Dummy variable, which equals 1 when a firm receives modified audit opinions and 0 otherwise.	Compustat
MERGE	Dummy variable, which equals 1 if a firm is engaged in a merger or acquisition and 0 otherwise.	Compustat
CROSS	Dummy variable, which equals 1 when a firm is cross-listed in the US and other areas and 0 otherwise.	Compustat
TURNOVER	Ratio of sales to total assets.	Compustat
CASHFLOW	Ratio of cash flow from operations to total assets.	Compustat
Country-level variables		
FDI	Foreign direct investment scaled by GDP.	World Bank
MCAP	Ratio of stock market capitalization to GDP.	World Bank
LNGDP	Natural log of gross domestic product (GDP) per capita in thousands of US dollars.	World Bank
RL	Rule of law.	World Bank
CORRUPTION	Corruption index.	World Bank