An empirical analysis of audit pricing and auditor selection: evidence from India

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Abstract

Purpose – This paper aims to examine various factors affecting the pricing of audit services and the selection of auditors in the Indian audit market. This paper also aims to investigate the impact of financial distress conditions on the audit pricing and auditor choice decisions of a firm, particularly in the context of a developing economy.

Design/methodology/approach – The sample comprises 22,644 firm-years for 1,366 Indian firms from 1990 to 2015. The authors adopt ordinary least squares regression technique to model audit fee, and logistic regression technique to model auditor choice as a function of various factors relating to firm attributes and auditor characteristics.

Findings – This paper finds that auditors tend to charge an audit fee premium when they are affiliated to a Big 4 auditor, have industry specialization or jointly provide auditing and non-auditing services. Additionally, firms with larger boards, higher proportion of independent board of directors and CEO–Chairman separation are more likely to choose a Big 4-affiliated auditor. The results also suggest that financially distressed firms tend to pay significantly lower audit fees and are more likely to choose non-Big 4 auditors.

Originality/value – This paper is among the few studies which investigate how financial distress impacts the audit pricing and auditor choice decisions of a firm in the context of emerging economies. The findings of this paper raises serious concerns about the credibility of the audited financial statements and corporate governance mechanisms of firms undergoing financial distress. The empirical results of this paper have strong implications for practitioners, regulators and investors.

Keywords Audit fees, Auditor choice, Non-audit services, Financial distress, Emerging economy

Paper type Research paper

1. Introduction

The paper examines various factors affecting the pricing of audit services and the selection of auditors in the Indian audit market. Literature on various aspects of audit services market in several countries is extensively available. However, a significantly large portion of such studies has focused on auditing issues in the context of developed markets. Much less attention has been paid to audit fee pricing and auditor selection mechanisms for firms domiciled in the developing markets (Hay *et al.*, 2006). Firms in developing markets are characterized by relatively weak legal and institutional structure, poor enforcement of shareholder rights, high ownership concentration and weak corporate governance

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standards (Khanna and Palepu, 2000; Khan *et al.*, 2015). This paper contributes to the audit services literature by studying the various factors influencing the audit fee pricing and auditor choices of Indian firms.

The Indian audit and assurance market is predominantly serviced by non-Big 4 auditors, particularly in the smaller auditee client segment (Ghosh, 2007). This is in sharp contrast to the global audit market, where the Big 4 accounting firms dominate the audit market across different geographical regions and industries (Francis, 1984; Basioudis and Francis, 2007). Moreover, the Indian auditing regulations do not allow multinational accounting firms (MAFs) to register themselves as audit firms in the country. Therefore, the Big 4 audit firms offer their auditing services to Indian companies only through their network of domestic affiliate firms[1]. The presence of Big 4 auditors through their affiliates makes our study all the more interesting. Another important feature is the domination of business groups in the Indian corporate sector. Khanna and Palepu (2000) analyze the performance of group affiliate firms in India and suggest that they tend to exacerbate the internal agency conflicts, particularly under weak corporate governance and monitoring environment. These characteristics of the Indian audit market make the context of our study particularly relevant for industry, academia and emerging market regulators.

Audit fee pricing mechanism and auditor selection process are among the most pertinent and extensively researched topics in the auditing literature. External auditors enhance the credibility of accounting information contained in the firm's financial statements that are presented to the outside investors, thereby improving the corporate governance standards (Fan and Wong, 2005; Knechel *et al.*, 2008). Moreover, Francis (1984) suggests that high-quality audits have positive economic implications for a firm, besides helping in regulatory compliance. External audits also help in mitigating internal agency conflicts in a firm by reducing the information asymmetry between the inside managers and outside owners. Previous studies on audit pricing indicate that audit fees are related to the auditee size (Basioudis and Francis, 2007; Carson and Fargher, 2007; Eshleman and Guo, 2014), audit complexity (Hay *et al.*, 2006; Griffin *et al.*, 2010; Hay, 2013) and auditor–auditee risk sharing (Simunic, 1980; O'Sullivan and Diacon, 2002). On the other hand, auditor choice literature reports that a combination of attributes concerning the potential auditor and auditee firm, as well as the structure of the audit market, tends to influence the auditor selection process (Beattie and Fearnley, 1995; Srinidhi *et al.*, 2014; Scott and Gist, 2013; Khan *et al.*, 2015). In our paper, we add to these two vital streams of audit literature by augmenting the information on a wide range of factors influencing the audit fee and auditor choice of a firm in a developing economy.

In this article, using an extensive sample of 22,644 firm-years for 1,366 Indian firms from 1990 to 2015, we analyze how auditor characteristics and conditions of auditee financial distress affect the negotiated audit fee. Further, we investigate how board characteristics and financial distress conditions of a firm influence the probability of appointment of a Big 4 auditor by the firm. Our results reveal that auditors with Big 4 affiliation, industry specialization or joint provision of non-auditing services tend to impose higher auditing charges on their clients. However, we find that auditee firms undergoing financial distress during the audit years are likely to be charged lower audit fees by their auditors. Moreover, the sign and magnitude of audit fee differential for financially distressed firms also depend on the joint effects of auditor characteristics such as Big 4 status and industry specialization.

In the auditor choice analysis, we discern that firms with larger boards and those that comprise a higher proportion of independent board members are more likely to select a Big 4 auditor for their auditing services. In addition, we notice that when the CEO of a firm also happens to be the Chairman of the Board or the firm is undergoing financial distress, the

auditee firm is less likely to hire the costlier auditing services of a Big 4 auditor. We also find that the presence of large boards and CEO–Chair separation significantly increases the likelihood of a Big 4 auditor selection in a financially distressed firm. Further, our analysis on audit fees borne by financially distressed clients suggests that there is a significant upward revision of audit fees in the financial year in which the firms recover from their financial distress.

Our findings on audit pricing and auditor choices of Indian firms add significant insights to the existing audit literature on emerging economies such as India (Simon *et al.*, 1986), Bangladesh (Habib and Islam, 2007; Karim *et al.*, 2013; Khan *et al.*, 2015), China (Lin and Liu, 2009), Malaysia (Simon *et al.*, 1992; Thahir Abdul Nasser *et al.*, 2006), Indonesia (Darmadi, 2016), South Africa (Simon, 1995), Thailand (Pratoomsuwan, 2017) and Uganda (Kaawaase *et al.*, 2016). In particular, our observations about the tendency of financially distressed firms to choose non-Big 4 auditors and lower their audit fees raise serious concerns about the credibility of the audited financial statements and corporate governance mechanisms adopted by these distressed firms. Our results imply that regulators as well as outside investors should reinforce the monitoring role of the auditors to mitigate the exacerbated agency costs inherently present in such financially distressed firms by advocating for board characteristics, such as larger board sizes and CEO–Chair separation, and auditor characteristics such as industry specialization. We would like to highlight that our study is one of the first to investigate how financial distress impacts the audit pricing and auditor choice decisions of a firm in the context of emerging economies. Furthermore, our findings remain robust upon additional sensitivity analysis.

The organization of the remaining paper is as follows: The Indian audit market structure is discussed in Section 2. The literature on audit pricing and auditor selection is reviewed in Section 3, and the key hypotheses pertaining to our research are developed. The sample selection and descriptive statistics are provided in Section 4. The empirical research models are presented in Section 5. Empirical results of the paper are discussed in Section 6. The results of the robustness tests are furnished in Section 7. Section 8 provides conclusion.

2. Structure of the audit market in India

The audit and assurance services are regulated by the Institute of Chartered Accountants of India (ICAI), which was established by the Government of India in 1949 as a statutory body under the Chartered Accountants Act, 1949. The purpose of ICAI was to set the Indian Accounting Standards for the auditing of financial statements (Johl *et al.*, 2016), which is similar to the role played by the American Institute of Certified Public Accountants (AICPA) in the USA. The body provides guidelines to Indian companies for presenting their audited financial statements.

The Companies Act of 2013, which regulates the incorporation of an Indian company and its responsibilities, mandates the firms to prepare, present and disclose their audited financial statements as per the prescribed schedules. The Act mandates each registered company to appoint an individual or a firm to audit its financial book of account and also provides detailed guidelines for the appointment, removal and resignation of auditors. Auditors' remuneration, as well as their powers and duties, are also covered by the Act.

The Comptroller and Auditor General (CAG) of India is responsible for auditing the accounts of the Government of India at state and central levels. The CAG also acts as an external auditor for Government and state-owned enterprises. The board of directors proposes the audit fees in such government-owned companies based on the guidelines prescribed by ICAI and CAG, which subsequently get approved by their shareholders (Ghosh, 2007). The Ministry of Corporate Affairs is responsible for

administering the ICAI to ensure that the Indian companies comply with the prescribed auditing standards and takes necessary actions in case of non-compliance.

The Securities and Exchange Board of India (SEBI) is the regulator of the Indian capital market and provides guidelines for the disclosure requirements and obligations of any publicly listed company. As per the stipulated guidelines, at least 50 per cent of the members on the board should be non-executive directors, with at least one woman director on the board. Further, the audit committee set up by the board should include at least three non-executive directors, a majority of whom are independent directors, and at least one director having expertise in accounting and financial domains. The audit committee oversees the process of financial reporting and the disclosure of accounting information. The role of the committee also includes recommending the statutory auditor and the audit fees to the board.

It is mandatory for all publicly listed companies to furnish the audited financial results for the full financial year, within 60 days from the end of the financial year, as a part of the listing agreement with the stock exchanges. The organizations are also required to submit limited review reports on a quarterly basis and audited reports on an annual basis to the respective stock exchanges. However, even though the general framework of corporate governance is reasonably put in place in India, various levers of such mechanisms such as representation of independent members on the board of directors and audit committees, protection of minority interests and mandatory rotation of auditors have been found to work relatively less effectively in the Indian audit environment, as compared to other developed capital markets.

Currently, the Chartered Accountants Act of 1949 that regulates the domestic accounting profession does not allow MAFs to register themselves as audit firms in the country or acquire any other Indian audit firm. Therefore, the MAFs, including the Big 4 audit firms (Deloitte, Ernst and Young or EY, KPMG and Price Waterhouse Coopers or PwC), offer their auditing services to Indian companies through their network of domestic affiliate firms. In this regard, the Indian audit market environment is similar in characteristics to few other emerging economies such as Bangladesh (Khan *et al.*, 2015) and Thailand (Pratoomsuwan, 2017), where international Big 4 audit firms are not allowed to have a direct presence and operate only through partnership with local affiliate firms.

Globally, the Big 4 accounting firms dominate the audit market and provide audit and assurance services to a majority of clienteles across different geographical regions and industries. Basioudis and Francis (2007) state that the Big 4 accounting firms audited 70 per cent of the companies in their sample of UK firms and received 86 per cent of the audit fees. On the contrary, the non-Big 4 audit firms captured a considerably larger combined market share in the domestic audit services, particularly in the smaller auditee client segment (Ghosh, 2007). In our analysis, we find that Big 4 audit firms together held a market share of merely around 25 per cent during the study period. However, the presence of Big 4 auditors is relatively higher among the larger (around 50 per cent among the top 100 firms) and foreign-owned (around 60 per cent) clients in India.

3. Background literature and hypotheses

3.1 Determinants of audit fee

Previous studies have examined the audit pricing mechanism of firms, predominantly based on empirical evidence obtained from the developed markets, and broadly divided the sources of demand for audit services into three separate but interlinked groups (Francis, 1984; Firth, 1985; Francis and Stokes, 1986; Beattie and Fearnley, 1995; Craswell *et al.*, 1995). The first one is based on the agency theory which asserts that auditors can reduce the agency costs through a credible monitoring or bonding

mechanism (Jensen and Meckling, 1976; Shleifer and Vishny, 1986). In such circumstances, auditors can play an effective governance role by credibly certifying the financial statements, thereby mitigating the agency costs by reducing the scope and extent of divergence of interests between the managers and the owners (Bushman and Smith, 2001).

The second source is the information-based demand for audits arising from information asymmetry issues and is closely related to the signaling theory. As per this proposition, investors face adverse selection risks in choosing their investment portfolios because of information asymmetries existing between the managers and the outside owners (Connelly *et al.*, 2011). In such cases, the reputation and characteristics of the auditor as well as the board and the top management can act as a signaling mechanism to overcome such adverse selection problems by enhancing the credibility of the financial statements of the firm for the outside capital market investors (Fan and Wong, 2005; Zhang and Wiersema, 2009; Al-Qadasi *et al.*, 2019).

The third source is the insurance demand for audit services which argues that auditors indemnify other monitoring agencies, such as the board of directors, against potential legal, financial and reputational risks. This insurance-based demand for auditors becomes particularly more important for firms undergoing financial distress or facing significant bankruptcy risks, as the auditors can act as co-insurers and provide additional insurance, if the firm had to face legal litigations and financial claims from its different stakeholders under such circumstances (Wallace, 1980). However, it may be worthy to emphasize that these different sources of demand for audit services are not mutually exclusive. The purpose of our paper is to identify some of the important determinants of audit pricing and auditor choice decisions and not to reject any of the audit service demand drivers in favor of another.

Literature points that audit fees are related to client size, operational and organizational complexities and auditor–client risk sharing (Craswell *et al.*, 1995). Several papers explore the association of audit fees with the reputation and industry specialization of auditors and explain the demand for differentiated auditing services using the frameworks of the agency theory, signaling theory and contracting environment (Craswell *et al.*, 1995). We attempt to extend this literature by investigating the effects of various auditee firms and auditor characteristics in the context of an important emerging economy.

3.1.1 Big 4 auditor. Numerous studies have investigated the Big N audit fee premium, but the evidence largely remains mixed (Hay, 2013). Beginning with the study by DeAngelo (1981), several papers have examined whether the market for audit services is characterized by quality-differentiated products. Palmrose (1986) documents the presence of Big 8 audit fee premium and attributes it to either higher-quality audit services or monopoly pricing power. The Big 4 audit firms are larger in size, more reputable in terms of brand name and have greater number of clients than non-Big 4 auditors. Therefore, these Big 4 auditors face greater potential legal liabilities than their non-Big 4 peers and have more to lose in case of any audit failure (Choi *et al.*, 2008). Consequently, the Big 4 auditors have higher incentives to put extra audit efforts in order to ensure higher audit quality relative to the non-Big 4 accounting firms.

Carcello *et al.* (2002) suggest that the Big 4 audit fee premium may be explained as an additional compensation for the increased audit efforts undertaken by the Big 4 auditors that lead to higher audit quality, as indicated by lower accounting errors in the audited financial results or higher earnings response coefficients of Big 4 clients (Teoh and Wong, 1993). As a result, audit fees have often been used as a proxy for audit quality in the audit literature. Further, Dye (1993) suggests that the Big 4 audit fee premium reflects the value of the option held by the shareholders to claim for monetary compensation against the auditors

in the event of any financial loss because of audit failure by the Big 4 auditors. However, the Big 4 audit fee premium has also been suggested to exist for non-competitive, market concentration-related factors resulting from the oligopolistic nature of the audit market rather than being based on superior audit quality alone (Campa, 2013; Al-Harshani, 2008).

On the contrary, Simunic (1980) asserts that the audit fees of Big 8 audit firms are significantly lower than those of the other auditors and suggests that such fee discounts possibly result from the economy of scale enjoyed by large auditors given their greater market share. Moreover, Kaawaase *et al.* (2016) examine the audit market in Uganda and fail to find any significant difference between the audit quality of Big 4 and non-Big 4 auditors.

Francis (2004) opines that the audit market is quality differentiated, primarily on the basis of the size of its auditors. Carson (2009) reports that larger audit firms are more likely to provide higher quality audit services, as they have more reputational capital at stake in the audit market. Furthermore, the concern of safeguarding the reputation and brand name leads the Big 4 auditors to exercise greater caution while certifying the financial statements (DeAngelo, 1981; Simunic and Stein, 1987) and adopt lower quantitative thresholds for materiality purpose while auditing their clients (Blokdijk *et al.*, 2003). For similar reasons, Eshleman and Guo (2014) convey that the auditees of Big 4 auditors are less frequently involved in financial frauds. Consistent with the arguments of a quality differentiated audit market, Pratoomsuwan (2017) find that a Big N audit fee premium exists in the audit market of Thailand for small as well as large auditee size clients.

However, the Big 4 auditors are also likely to demand higher audit fees for providing better quality audit services to their clients because of the additional expenses incurred. For example, the Big 4 audit firms have been found to invest more resources in training their employees (Eshleman and Guo, 2014). As a result, Big 4 auditors charge higher fees because of greater audit efforts or higher perceived quality and reputation of their auditing services (Francis, 2004; Beattie *et al.*, 2001; Firth, 1997). Accordingly, our first hypothesis is as follows:

H1a. There exists a Big 4 audit fee premium in the Indian audit services market.

3.1.2 Industry specialization. Industry knowledge and specialization are among the key attributes affecting audit quality (Carson, 2009). Auditors specializing in any particular industry are able to provide better auditing services as exhibited by the higher earnings quality of the auditee firms (Krishnan, 2003). For this reason, the specialist auditors tend to hire more employees with industry-specific expertise and provide additional training facilities relative to the non-specialist auditors (Francis *et al.*, 2005). Such industry specialization allows the auditors to strategically attract new clients by offering industry-specific auditing services. For example, audit firms with established reputation as industry specialists are better able to signal their superior knowledge about industry-specific business, accounting or taxation-related issues. Therefore, industry specialist auditors may charge higher fees to compensate for the greater audit efforts and higher investments in building such specialized capabilities and in exchange provide higher quality audit services to their industry-specific clients.

However, previous research uncovers mixed evidence on the relation between industry specialization of auditors and their audit fees. Many studies state that clients pay more for industry-specialized auditing services (DeFond *et al.*, 2000; Carson, 2009). On the contrary, a few studies discern no association (Palmrose, 1986) or inverse relationship (Ettredge and Greenberg, 1990) between the auditor specialization and audit fees. Causholli *et al.* (2010) allude that audit fee premium because of auditor specialization varies with the auditee firm characteristics, auditor bargaining power and range of auditing services provided to the client. Carson and Fargher (2007) testify that depending on the size of the auditee firm,

specialist auditors charge an audit fee differential to their clients. Srinidhi *et al.* (2014) find that family firms with better corporate governance mechanisms tend to pay an audit fee premium for hiring industry specialist auditors. Therefore, the nature and magnitude of the impact of industry specialization on audit fees in the Indian audit market remain an open and interesting question for empirical investigation. This leads us to the next hypothesis:

H1b. There exists an audit fee differential for specialized auditors in the Indian audit services market.

3.1.3 Joint provision of non-audit services. The primary role of an auditor is to audit and assure the outside investors that the financial accounts of an organization are appropriate. However, the audit firms also advise their clients on various non-auditing issues, such as taxation, corporate law and other business matters. The Companies Act of 1956 requires Indian companies to disclose such payments made by a company to its auditors for the provision of any non-audit services (NAS).

The joint offering of auditing and non-auditing services is a contentious issue in the auditing industry as well as academic literature. The proponents of joint audit services tend to argue that economies of scope exist because of the information spillovers across the auditing and non-auditing services jointly provided by an auditor, which can cause a substantial improvement in the audit quality (Simunic, 1984). For example, auditors may enhance their understanding of the business and operational complexities of their auditee clients through their non-audit related consultancy activities. Such synergies between the dual services may result in reduced audit fees because of cross-subsidization.

However, an alternative viewpoint holds that jointly provided NAS may impair auditor independence, thereby adversely affecting the quality of the audited financial statements (Dobler, 2014). McMeeking *et al.* (2006) document the implications that joint offering of audit and NAS fees has on the auditor independence. Habib and Islam (2007) examine the determinants and consequences of joint provision of NAS on auditor independence in the audit market of Bangladesh. Legoria *et al.* (2017) examine the effects of joint provision of NAS on audit quality and find that auditors are more inclined to give favorable unqualified audit opinions to those clients who solicit both audit and NAS from them. Chu and Hsu (2018) find that the negative effect of joint provision of NAS on audit quality was partially mitigated after the introduction of Sarbanes–Oxley Act in 2002, which stipulated the mandatory disclosure of audit and non-audit fees and specified the scope of NAS that can be provided by the auditors to their clients.

Prior studies on the provision of joint audit and NAS also find that the audit fees are positively associated with the non-audit fees (Niemi, 2005). This relationship stems from the increased audit effort arising from concurrent organizational changes, monopoly power in the non-audit services market or the inherently more complex and risky nature of such consultancy services. However, according to Causholli *et al.* (2010), the association of audit fees with the non-audit charges may vary depending on the type of NAS offered by the auditor. Quick *et al.* (2013) also fail to find any influence of agency costs on the demand for NAS in the German audit market. Therefore, we suggest the following hypothesis to explore the association between audit fees and joint provision of NAS for Indian audit environment:

H1c. Auditors charge higher audit fees when they also provide joint non-audit services.

3.1.4 Auditee firm financial distress. As per prior studies, audit fees are related to the size of the auditee, complexity of the audit and risk sharing between the auditor and auditee (Simunic, 1980; Craswell *et al.*, 1995). The risk sharing variables assess the risk to the auditor

that arises from auditing the client (Gul *et al.*, 2007). Auditors estimate the risk borne by them because of any audit engagement with a given client and incorporate it in their audit pricing decisions (Abernathy *et al.*, 2019). Therefore, auditors may try to negotiate for an audit fee premium if the auditee firm is undergoing accounting losses or financial distress (Griffin *et al.*, 2010; Cahan *et al.*, 2011) because of the heightened perceived risk of auditor–auditee engagement. Similarly, auditors may be more comfortable in offering larger fee discounts to their clients, when they are facing lower financial risks or have prior relationships with the client (Li and Luo, 2017).

However, as Craswell *et al.* (1995) point out, audit risk is conceptually different from financial risk even though they may be positively correlated. Hence, it is quite possible that if the audit market is highly competitive, then firms experiencing losses or financial distress may heavily bargain with their auditors for a temporary audit fee discount. Auditors may also strategically agree to receive a lower audit fee during the years of financial distress or accounting losses of the auditees to retain their existing clients. The threat of losing such financially distressed firms to the competition is particularly acute in the auditing market given the commonly observed "lowballing" practice of initial audit fee discount for the potentially new clients (DeAngelo, 1981; Simon and Francis, 1988).

Auditor client negotiations may lead to either an audit fee increase or audit fee discounts depending on the strength and merit of the bargaining power of the client (Casterella *et al.*, 2004) and perceived audit quality of the auditor (Hay and Jeter, 2011). Beck and Mauldin (2014) suggest that top executives and influential managers can significantly reduce the audit fee burden by bargaining hard during periods of financial distress. Therefore, the financially distressed or loss-making firms may strongly demand for audit fee reductions even at the cost of bearing lower quality audits from existing or relatively less reputed auditors. Similarly, firms undergoing financial distress may also have higher incentives to switch their auditors to smaller and less reputed accounting firms and renegotiate the scope of audit services not only to reduce their audit fees but also to increase the opportunity and scope of undetected earnings management (Schwartz and Menon, 1985). Hence, we hypothesize that:

H1d. Auditors charge lower audit fees to firms that are undergoing financial distress.

3.2 Determinants of auditor choice

Auditor selection is an important decision for a firm and its stakeholders given the importance of safeguarding the external auditing in the interests of the firm's debtholders and shareholders by ensuring the credibility of accounting information. Numerous studies have explored the factors affecting auditor selection by a firm, primarily in the context of developed economies (Beasley and Petroni, 2001; Chaney *et al.*, 2004; Niskanen *et al.*, 2010). Nonetheless, relatively few studies have investigated auditor selection in the audit market setting of emerging economies such as Malaysia (Thahir Abdul Nasser *et al.*, 2006), China (Lin and Liu, 2009), Turkey (Aksu *et al.*, 2007) and Indonesia (Darmadi, 2016).

External audits can help a firm in mitigating its internal agency conflicts emerging from the separation of ownership from the management by reducing the information asymmetry between them. Knechel *et al.* (2008) observe that auditing can reduce internal agency conflicts by improving the credibility of the financial statements. As a result, it is evident from the auditor choice literature that firms with higher agency conflicts in their ownership structures tend to hire Big N auditors (Choi and Wong, 2007).

Signaling theories suggest that the choice of an auditor and its reputation for credible certification of financial statements may convey an informational signal to the capital

market investors and help them in mitigating adverse selection risks in the presence of information asymmetry problems (Titman and Trueman, 1986). Consistent with the informational signaling role of auditors, Moizer (1997) finds that investors take into consideration information pertaining to the auditor choice of a firm issuing an IPO in its pricing decisions. Therefore, investment banks and audit committees tend to recommend hiring the Big N auditors during fund raising processes because of high quality signaling considerations in the capital market (Palmrose, 1986). Krishnan (2003) affirms that industry specialist auditors tend to provide more credible certification of the accounting numbers to the outside investors, thereby reducing the valuation uncertainty of the firm. Knechel *et al.* (2008) assert that auditor selection is a function of complexity, as measured by the firm's size and workforce diversity.

Besides the informational signaling role, the choice of auditors may also act as an insurance signaling role by providing investors with a contingent claim on the auditor in case of an audit failure event (Dye, 1993). Moreover, auditors may also indemnify other monitoring agencies, such as the board of directors, against potential legal, financial and reputational risks. This insurance role of auditors may become more relevant for firms undergoing financial distress or facing risk of corporate failure. Therefore, overall, the evidences clearly signify that the selection of an auditor may have significant economic implications for a firm, besides assisting in regulatory compliance (Francis, 1984).

3.2.1 Board size. Auditors play an important governance role by providing credible certification of accounting information generated by the firm for the outside investors (Fan and Wong, 2005). The services provided by reputable auditors tend to mitigate the internal agency conflicts because of the separation of management from capital providers. Hossain *et al.* (2010) express that the selection of an auditor by a firm is related to its level of corporate governance. Audits contribute to the overall corporate governance of a firm by providing a monitoring role to the external auditors (Ashbaugh and Warfield, 2003).

The board of directors of a firm plays an important role in setting the level of corporate governance (Fama and Jensen, 1983). However, corporate governance studies on board characteristics have found that decision-making and coordination work can be more challenging in larger boards because of greater communication problems and higher level of difficulty in consensus building (Yermack, 1996; Ahmed *et al.*, 2006). Such operational inefficiencies of larger boards may ultimately weaken the monitoring effectiveness of the board and lower their ability to supervise the management, thereby increasing the agency costs between the managers and the shareholders (Jensen, 1993).

In such circumstances, larger boards may be more inclined to appoint reputable Big 4 auditors to alleviate the agency conflicts by delegating the governance and monitoring of financial reporting process to the reputable external auditors. Kaawaase *et al.* (2016) find that Big 4 auditors ensure better compliance with legal, accounting and taxation-related regulations. Reputable auditors may also alleviate the risk of accounting frauds and lower the chances of lawsuits because of low quality financing reporting or audit failure events (Carcello *et al.*, 2002; Srinidhi *et al.*, 2014). Therefore, larger boards may also prefer to hire Big 4 auditors to mitigate these agency problems emerging from their internal coordination-related inefficiencies. Consistent with this, Fan and Wong (2005) and Zhou *et al.* (2018) observe that firms facing higher agency costs are typically more inclined to use the services of high-quality auditors to positively influence the perception of outside investors about the credibility of the corporate governance and financial reporting mechanism. Scott and Gist (2013) further document that after Arthur Anderson's demise in 2002, many firms with larger boards switched to Big 4 auditors. Therefore, in line with the extant auditor choice literature, we propose that:

H2a. Firms with larger boards tend to choose Big 4 auditors.

3.2.2 Board independence. The provision of audit services includes an insurance dimension whereby auditors indemnify other stakeholders from potential financial losses. Independent directors face substantial reputational and legal risks in ensuring the reliability of the accounting information disclosed by the firm. For example, independent boards have strong incentives to safeguard their reputation as credible monitors of corporate governance mechanisms in a firm (Fama and Jensen, 1983). The corporate governance literature has also documented the positive influence of independent directors and audit committees in the alleviation of agency conflicts through the selection of reputable high-quality auditors (Al-Rassas and Kamardin, 2016). DeFond and Zhang (2014) find that companies with better governance mechanisms tend to choose higher-quality auditors who can better safeguard the investor rights by detecting and preventing any insider expropriation of investor wealth (Newman *et al.*, 2005).

Big N auditors may significantly alleviate the risks borne by the independent directors by providing a credible certification of the financial results at the cost of the auditor's own professional and reputational liability. Bliss (2011) states that independent directors are more willing to choose reputable auditors to protect their own reputation capital and reduce the legal risk exposure. Many studies also suggest that board characteristics, such as size and independence, positively influence the demand for higher quality audit services (Dechow *et al.*, 1996; Xie *et al.*, 2003; Gul and Leung, 2004). Independent boards are more effective in monitoring the activities of managers, resulting in higher quality of financial reporting by the firms (Klein, 2002; Carcello *et al.*, 2006; Larcker *et al.*, 2007). This leads us to the next hypothesis:

H2b. Firms with more independent boards tend to choose Big 4 auditors.

3.2.3 CEO duality. Independence of the company's board of directors may be constrained by CEOs who also happen to be the Chairman of the Board (Finkelstein and D'Aveni, 1994; Bliss, 2011). Therefore, CEO duality is likely to result in poorer corporate governance practices and weaker boards. A CEO who is jointly holding chairmanship position tends to be more powerful, and may exert her influence more effectively on other board members, thereby impeding the governance role and monitoring mechanism of the board (Jensen, 1993). This occurrence may provide greater opportunities for agents to expropriate resources at the cost of the owners, particularly as the number of family-owned and business group-affiliated firms is very large in a developing country such as India. Family members and their associates occupying top management positions and board seats may also lead to managerial entrenchment (Wang, 2006). Therefore, CEO–Chair duality may exacerbate the agency problems within a firm by enhancing the power of the CEO and widening the divergence of interests between the managers and the owners.

Top executives and management play an important role in the selection and negotiation process of the auditors. Hence, firms with CEO–Chair dual structure may prefer hiring non-Big 4 auditors to weaken the monitoring mechanism and undermine the audit quality of the external auditors. Consistent with this, Lin and Liu (2009) find that Chinese firms with CEO–Chair dual roles tend to choose lower quality auditors. For similar reasons, Darmadi (2016) examines the Indonesian audit market and finds that family-controlled firms may be more inclined to hire non-Big 4 auditors for auditing their financial statements to sustain the opaqueness benefits.

On the other hand, Karim *et al.* (2013) study the audit environment in Bangladesh and note that the nature of agency problems within a firm has a significant influence on the association between CEO–Chair duality and auditor selection of the firm. Therefore, from a signaling theory perspective, firms with greater agency conflicts may benefit more by choosing Big 4 auditors to signal the credibility of their financial reports (Al-Qadasi *et al.*, 2019). Accordingly, both Fan and Wong (2005) and Zhou *et al.* (2018) suggest that firms with greater agency problems in their ownership structures are more likely to employ higher quality auditors as bonding mechanisms and monitoring agencies to alleviate the principal–agent agency conflicts. Hence, the choice of the auditor by firms managed by CEO–Chairs remain an interesting empirical query in the context of Indian audit market. This leads us to our next hypothesis:

H2c. Firms with CEO duality tend to choose non-Big 4 auditors.

3.2.4 Auditee firm financial distress. The auditor choice involves a complex combination of attributes pertaining to the potential auditors and auditee firms, as well as the structure of the audit market (Beattie and Fearnley, 1995). When the auditee firm is characterized by financially distressed conditions, at least three major reasons influence the firm to more often choose a non-Big 4 auditor for the auditing services.

First, Big 4 auditors usually charge a fee premium for providing higher-quality auditing services. Hence, under circumstances of financial distress, firms may try to reduce their audit fee by hiring lower-quality audit services. Second, firms would have greater incentives to manipulate their earnings when they are undergoing financial distress. Management may also try to hide or delay the release of negative earnings news or engage in creative accounting practices which may prevent the outside investors from being fully aware of the financially distressed condition of the firm. Schwartz (1982) finds empirical evidence suggesting that financially distressed firms tend to engage in earnings-increasing accounting changes more frequently than financially healthy firms.

Third, as Big 4 auditors have an established brand name and strong reputation in the audit market, they may avoid auditing financially distressed firms to safeguard their reputation and brand name in the audit market. As firms undergoing financial distress tend to exhibit deteriorating operating performance, it significantly increases the risk of litigation and lawsuits against the auditors, particularly in the event of accounting restatements and audit failures (Carcello and Palmrose, 1994; Li and Luo, 2017). Therefore, high-quality auditors who have more to lose in terms of reputational capital are likely to be more skeptical in taking up audit assignments of financially distressed companies.

Finally, even though firms have greater incentives for earnings management during periods of financial distress, the presence of Big 4 auditors may constrain their ability to manipulate the financial results because of higher audit standards adopted by them (Eshleman and Guo, 2014). Hence, financially distressed firms may not appoint Big 4 auditors who exhibit greater conservatism while issuing their audit reports. Schwartz and Menon (1985) observe similar tendencies in firms to switch their auditors when their financial condition is deteriorating.

On the contrary, from a signaling theory perspective, financially distressed firms may be able to address the concerns of the creditors and investors more effectively if they choose to hire better quality auditors for certifying their financial statements. Larger audit firms may also be able to provide additional insurance benefits against future claims in the event of financial losses from corporate failure or bankruptcy (Wallace, 1980). Larger audit firms may also be better equipped in terms of legal and technical expertise to offer their specialized advisory services to the financially distressed clients, thereby helping them to

mitigate the agency conflicts which aggravate further during financial distress conditions. Therefore, we attempt to investigate whether such financially distressed firms remain willing and capable of bearing the additional audit fee burden in hiring the higher-quality audit services of Big 4 auditors through our final hypothesis:

H2d. Firms undergoing financial distress tend to choose non-Big 4 auditors.

4. Research design

4.1. Audit fee model

We examine the factors affecting the audit fees of a firm by regressing the natural logarithm of audit fees (LOG_AF) on a set of hypotheses variables and a host of control variables, as follows (regression model A):

Model specification form: Dependent variable = Intercept term + (*hypothesized control variables*) + (additional control variables) + error term

$$\begin{aligned}\text{LOG\_AF}_{i,t} = \alpha_0 + \big(&\beta_1\text{*}BIG4_{i,t} + \beta_2\text{*}SPECIAL_{i,t} + \beta_3\text{*}NAF\_DUM_{i,t} \\ &+ \beta_4\text{*}FIN\_DIST_{i,t}\big) + \big(\beta_5\text{*LOG\_TA}_{i,t} + \beta_6\text{*LOG\_AGE}_{i,t} \\ &+ \beta_7\text{*LOG\_SEG}_{i,t} + \beta_8\text{*CATA}_{i,t} + \beta_9\text{*ROA}_{i,t} + \beta_{10}\text{*LOSS}_{i,t} \\ &+ \beta_{11}\text{*LEV}_{i,t} + \beta_{12}\text{*NSALESGR}_{i,t} + \beta_{13}\text{*TOBINQ}_{i,t} \\ &+ \beta_{14}\text{*GFC}_{i,t} + \beta_{15}\text{*INITIATE}_{i,t} + \beta_{16}\text{*LOG\_TENURE}_{i,t} \\ &+ \beta_{17}\text{*BG}_{i,t} + \beta_{18}\text{*PSU}_{i,t} + \beta_{19}\text{*FGN}_{i,t} + \beta_{20}\text{*INSIDER}_{i,t} \\ &+ \beta_{21}\text{*FII}_{i,t} + \beta_{22}\text{*LOG\_BSIZE}_{i,t} + \beta_{23}\text{*BIND}_{i,t} \\ &+ \beta_{24}\text{*CEOD}_{i,t} + \text{INDUSTRY\_FE}_{i,t} + \text{YEAR\_FE}_{i,t}\big) + \varepsilon_{i,t} \end{aligned} \quad (1)$$

Appendix describes the above-mentioned variables. Following the mainstream literature on audit fee pricing models (Francis, 1984; Palmrose, 1986; Francis *et al.*, 2005; Carson and Fargher, 2007), we adopt the pooled regression technique including both industry and year fixed effects in our model specification. Our first hypothesis variable BIG4 takes the value of one if the auditor is affiliated to Price Waterhouse Coopers (PwC), KPMG, Ernst and Young (E&Y) or Deloitte and zero otherwise. For the second hypothesis variable, we follow the literature on auditor industry specialization (Carson, 2009) to create an industry specialist auditor dummy (SPECIAL) which takes the value of one if the auditor is ranked among the top two in any given industry-year. Industry classification is done on the basis of two-digit National Industry Classification (NIC) code, and ranks are calculated according to the audit fee-based market shares of the auditors. The market share-based measure of specialization assumes that specialist auditors provide superior audit services because of their specialized industry knowledge and auditing skills related to a particular industry (Neal and Riley, 2004). Our third hypothesis variable NAF_DUM takes the value of one if the auditor jointly provides auditing and non-auditing services to the auditee client and zero otherwise. For our financial distress-related hypothesis, we exploit the Altman Z-score model (Altman, 1968; Altman, 2000) to create a dummy (FIN_DIST) that takes the value of one when the Z-score is less than 1.81 in the corresponding audit year and zero otherwise. The Z-score of a firm is computed as per the Altman (1968, 2000) Z-Score (ZS) model as follows[2]:

$$ZS_{i,t} = 0.012*(WC_{i,t}/TA_{i,t}) + 0.014*(RE_{i,t}/TA_{i,t}) + 0.033*(EBIT_{i,t}/TA_{i,t}) + 0.006*(MVE_{i,t}/BVTL_{i,t}) + 0.999*(NS_{i,t}/TA_{i,t}) \quad (2)$$

As per our proposed hypotheses on audit fee determinants, we expect the coefficient estimates of BIG4, SPECIAL and NAF_DUM to be significantly positive. Moreover, the coefficient of the variable FIN_DIST should be significantly negative if firms experiencing financial distress appoint non-Big auditors to reduce their audit fee expenses.

We control for a host of firm-specific variables, such as firm size (LOG_TA), age (LOG_AGE), number of business segments (LOG_SEG), current assets to total assets ratio (CATA), sales growth (NSALESGR), total debt to total assets ratio (LEV), return on assets (ROA) and Tobin's Q (TOBINQ). Auditor characteristics, such as the initial year of engagement (INITIATE) and tenure of client relationship (LOG_TENURE), which have been found to affect the audit fee of a firm in prior studies are also controlled. We also control for several ownership characteristics (Ghosh, 2011), such as business group affiliation (BG), government affiliation (PSU), foreign ownership (FGN), promoter shareholding (INSIDER) and shareholding by foreign institutional shareholders (FII). Board characteristics (Bliss, 2011), such as board independence (BIND), board size (LOG_BSIZE) and CEO duality (CEOD), in the audit fee regression model are also controlled. Finally, we include a global financial crisis dummy (GFC) that takes the value of one if the audit year overlaps with the global macroeconomic crisis during 2007 to 2010 and zero otherwise.

4.2 Auditor choice model

To investigate the factors that influence the decision of a firm to hire a Big 4 auditor, we propose the following model specification (regression model B):

Model specification form: Dependent variable = Intercept term + (*hypothesized control variables*) + (additional control variables) + error term

$$\begin{aligned} BIG4_{i,t} = {} & \alpha_0 + (\beta_1*LOG\_BSIZE_{i,t} + \beta_2*BIND_{i,t} + \beta_3*CEOD_{i,t} + \beta_4*FIN\_DIST_{i,t}) \\ & + (\beta_5*LOG\_TA_{i,t} + \beta_6*LOG\_AGE_{i,t} + \beta_7*LOG\_SEG_{i,t} + \beta_8*CATA_{i,t} \\ & + \beta_9*LISTING_{i,t} + \beta_{10}*ROA_{i,t} + \beta_{11}*LOSS_{i,t} + \beta_{12}*LEV_{i,t} \\ & + \beta_{13}*NSALESGR_{i,t} + \beta_{14}*TOBINQ_{i,t} + \beta_{15}*NAF\_DUM_{i,t} + \beta_{16}*BG_{i,t} \\ & + \beta_{17}*PSU_{i,t} + \beta_{18}*FGN_{i,t} + \beta_{19}*INSIDER_{i,t} + \beta_{20}*FII_{i,t} \\ & + INDUSTRY\_FE_{i,t} + YEAR\_FE_{i,t}) + \varepsilon_{i,t} \end{aligned} \quad (3)$$

For our analysis, we follow the literature on auditor choice determinants (Fan and Wong, 2005; Choi and Wong, 2007; Khan *et al.*, 2015; Fang *et al.*, 2017) and adopt a pooled logistic regression model including industry and year fixed effects to estimate the chances of hiring a Big 4 auditor by the auditee firm. Our first hypothesis variable is board size, which is measured by the logarithm of the number of board of directors in a firm (LOG_BSIZE). The second hypothesis variable captures the degree of board independence, which is measured by the percentage of independent directors in the board of a firm (BIND). The third hypothesis variable is a dummy for CEO duality (CEOD), which takes the value of one if the CEO and the Chairman of the Board are the same and zero otherwise. The fourth hypothesis

variable is the financial distress dummy (FIN_DIST) estimated using the Altman Z-score model, as discussed earlier in the audit fee regression model above.

As per our proposed hypotheses on auditor choice determinants, we expect the coefficients of LOG_BSIZE and BIND to be significantly positive if firms having larger boards or higher proportion of independent directors are more likely to appoint reputable Big 4 auditors. On the other hand, we expect the coefficient estimates of CEOD and FIN_DIST to be significantly negative, provided that the firms characterized by CEO duality or financial distress are less likely to appoint a Big 4 auditor.

Going by the previous studies on auditor choice models, we control for a host of firm-specific variables, such as firm size (LOG_TA), age (LOG_AGE), number of business segments (LOG_SEG), return on assets (ROA), loss dummy (LOSS), total debt to total assets ratio (LEV), current assets to total assets ratio (CATA), sales growth (NSALESGR) and Tobin's Q (TOBINQ). The same applies to auditor characteristics, such as joint provision of NAS (NAF_DUM), which are used as control variables in our auditor choice model specification. We also follow previous literature (Choi and Wong, 2007; Darmadi, 2016) to control for several ownership characteristics, such as business group affiliation (BG), government affiliation (PSU), foreign ownership (FGN), promoter shareholding (INSIDER) and shareholding by foreign institutional shareholders (FII) in the auditor choice model. Firms that are going public have stronger incentives to hire more reputable auditors to certify them in a credible manner for the outside investors (Beatty, 1989). Therefore, we include a listing dummy (LISTING) which takes the value of one if the firm went public in the immediately preceding, current or immediately following audit year and zero otherwise.

In both the regression models (A and B) mentioned above, we include dummy variables for each industry (classified on the basis of two-digit NIC codes) and firm-year to control for industry and year fixed effects. All the regression results presented in this paper report the *t*-statistics computed using robust standard errors.

5. Sample data

5.1 Data sources and summary

Our sample consists of all the listed firms as on March 31, 2015, which are classified under groups A and B on the Bombay Stock Exchange (BSE)[3]. We collect information relating to the accounting and financial statements of our sample firms with financial years ending between March 1990 and March 2015 from the Centre for Monitoring Indian Economy (CMIE) Prowess database.[4] Our preliminary sample comprises 31,252 firm-years for 1,600 firms.

Table I provides the criteria for sample selection. We remove the observations of those firms with financial years not equal to 12 months. We also eliminate firm-year observations with missing or negative values of total assets or net sales. We classify industries as per the two-digit NIC codes and require each firm to have at least five observations in the correspondingly classified industry. Finally, following the literature, we exclude the observations of firms belonging to the financial sector. This process results in a final sample of 22,644 firm-years for 1,366 firms. We also winsorize all the continuous variables at the 1st and 99th percentile by the fiscal-year to mitigate the influence of outliers.

Table II presents the summary of sample data distribution across the industries (Panel A) and financial years (Panel B). Almost one-thirds of our sample firm-year observations belong to the consumer discretionary sector, followed by the industrials, healthcare and materials sector. We observe that the Big 4 auditors are most dominant in terms of their

Criterion	No. of firms	No. of firm-years
Initial sample from CMIE Prowess (March 1990-March 2015)	1,600	31,252
Less: Firm-years of firms which have changed their financial years	5	1,499
	1,595	29,753
Less: Firm-years of firms with missing or negative total assets or net sales	63	2,946
	1,532	26,807
Less: Firm-years of firms with missing values of firm and auditor characteristics	4	2,018
	1,528	24,789
Less: Firm-years with less than five observations in the corresponding industry-years (where industry classification is as per two-digit NIC code)	37	1,007
	1,491	23,782
Less: Firm-years of firms belonging to financial sector (including banks, real estate and diversified financials)	125	1,138
Final sample (March 1990-March 2015)	1,366	22,644

Table I.
Sample selection

GIC sector (based on two-digit GIC code)	Big4 auditor Firm-year observations (#)	Big4 auditor % of sample (%)	Non-Big4 auditor Firm-year observations (#)	Non-Big4 auditor % of sample (%)	Full sample Firm-year observations (#)	Full sample % of sample (%)
Panel A: Sample distribution across GIC sectors						
Consumer discretionary	1,694	21.5	6,183	78.5	7,877	100.0
Consumer staples	397	25.3	1,172	74.7	1,569	100.0
Energy	90	27.2	241	72.8	331	100.0
Health care	1,211	31.8	2,592	68.2	3,803	100.0
Industrials	1,020	24.9	3,073	75.1	4,093	100.0
Information technology	515	37.4	862	62.6	1,377	100.0
Materials	604	19.4	2,511	80.6	3,115	100.0
Telecommunication	76	40.2	113	59.8	189	100.0
Utilities	103	35.5	187	64.5	290	100.0
Full sample	5,710	25.2	16,934	74.8	22,644	100.0
Panel B: Sample distribution across financial years						
Time period (based on financial year)						
1990-1995	722	28.4	1,819	71.6	2,541	100.0
1996-2000	804	21.8	2,884	78.2	3,688	100.0
2001-2005	1,052	22.7	3,573	77.3	4,625	100.0
2006-2010	1,536	26.8	4,186	73.2	5,722	100.0
2011-2015	1,596	26.3	4,472	73.7	6,068	100.0
Full sample	5,710	25.2	16,934	74.8	22,644	100.0

Table II.
Sample data summary

market share (measured as percentage of audited firm-years) in the telecom (40.2 per cent), information technology (37.4 per cent) and utilities (35.5 per cent) sectors. This trend appears to be consistent with the practice of companies belonging to heavily regulated industry or requiring specialized audit services preferring to appoint one of the Big 4 auditors for

obtaining better and more specialized audit services. The Big 4 auditors together audited around one-fourth of the firm-year observations during our sample period, with a gradual increasing trend in their market share during the recent years.

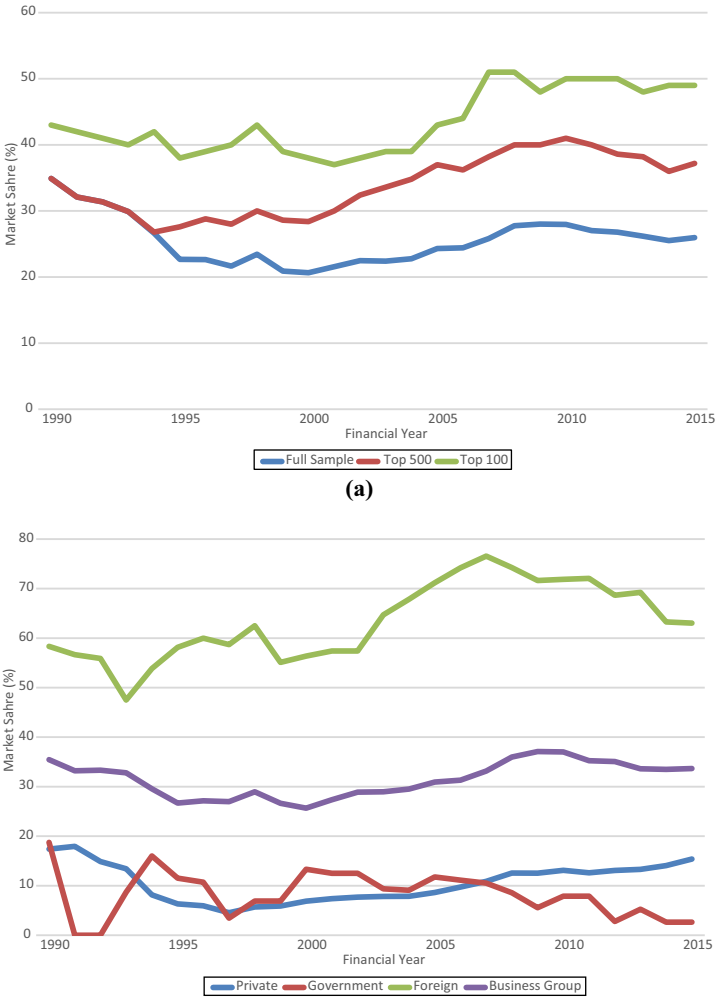
5.2 Descriptive statistics

The distribution of the market share among the Big 4 auditors (based on the number of audited firm-years) during our sample period is furnished in Figure 1. Figure 1(a) depicts the break-up for the different groups of auditee firms, classified on the basis of auditee firm size, while Panel B shows the break-up for different types of ownership structure in the auditee firms. We discern that the Big 4 auditors covered around 34 per cent of the top 500 firms and 44 per cent of the top 100 firms in our sample. The higher propensity of larger audit clients to choose Big 4 auditors is in line with the previous findings in the literature (Palmrose, 1988; Craswell *et al.*, 1995). We also observe that around 63 per cent of the foreign-owned audit clients and about 31 per cent of the business group-affiliated firms hire one of the Big 4 auditors in India. On the other hand, government-owned companies and private, non-business group-affiliated firms prefer to appoint a non-Big 4 auditor, possibly because of lower audit fees (Ghosh, 2007).

Table III displays the descriptive statistics of the auditee firms and the auditor characteristics in our sample. The median age (AGE) of the firms is 34 years, and the median size, as measured by the total assets (TA), is INR2,658m. In comparison, the average size of an American firm in the study of Francis *et al.* (2005) is US$1,912m and of an Australian firm in the study of Carson and Fargher (2007) is AU$658m. The median promoter ownership (INSIDER) in our sample is 54 per cent, while the median ownership held by the foreign institutional investors (FII) is only 5 per cent, which is in line with the documented fact that the Indian market is largely promoter driven. Finally, we note that the mean (median) audit fees (AF) and non-audit fees (NAF) for our sample are INR1.83m and INR0.72m (INR0.70m and INR0.20m), respectively[5].

Tables IV and V present the descriptive statistics of the sub-samples created on the basis of size (Table IV) and financial health (Table V) of firms. The size-based partitioning is done on the basis of the median values of total assets held by firms belonging to each industry year, while the financial health-based partitioning is implemented using the financial distress (FIN_DIST) dummy variable. Panel A suggests that larger firms are more inclined to hire auditors with Big 4 status, industry specialization or those who jointly provide non-auditing services. Consequently, we find that the average audit and non-audit fees are significantly higher for larger group of firms. On the contrary, smaller firms tend to exhibit higher incidence of financial losses and greater average promoter ownership relative to the larger firms. In terms of board characteristics, we find that larger firms tend to have larger board size with higher likelihood of CEO–Chairman duality, even though the proportion of independent directors in the board is at a similar level across these two sub-groups.

A comparison of sub-samples created on the basis of financial health of firms (Panel B) suggests that healthier firms tend to exhibit higher sales growth as well as greater profitability. They are also more inclined to choose auditors with Big 4 status, industry specialization or those jointly providing non-auditing services. Accordingly, we observe that the audit and non-audit fees are on an average higher for the financially healthier group of firms relative to the distressed ones. On the other hand, financially distressed firms tend to exhibit higher incidences of financial losses and lower average ownership by promoters and foreign institutional investors relative to their healthier counterparts.



Notes: (a) Big 4 auditors' market share from 1990 to 2015 for a sample of top100 and 500 auditee firms, ranked on the basis of total assets; (b) Big 4 auditors' market share from 1990 to 2015 for different sub-samples, categorized on the basis of type of ownership. This presents the distribution of Big 4 auditors' market share for different sub-samples, categorized on the basis of auditee firm size (full sample, top 100 firms and top 500 firms, on the basis of total assets) and type of ownership (private ownership, government ownership, foreign ownership and business group affiliated)

Figure 1.
Auditor market share distribution

Variable name	Units	*N*	Mean	Median	SD
Panel A: Firm characteristics					
af	INR mm	16,618	1.83	0.70	3.30
age	Years	22,644	41.48	34.00	20.86
bg	Dummy	22,644	0.54	1.00	0.50
bind	#	9,605	0.58	0.56	0.16
bsize	#	9,605	10.06	10.00	2.96
cata	#	22,167	0.15	0.02	0.23
ceod	Dummy	9,605	0.41	0.00	0.49
fgn	Dummy	22,644	0.06	0.00	0.24
fii	#	14,563	0.05	0.00	0.08
fin_dist	Dummy	16,698	0.51	1.00	0.50
insider	#	14,563	0.53	0.54	0.17
lev	#	22,644	0.08	0.00	0.18
listing	Dummy	22,644	0.04	0.00	0.19
loss	Dummy	22,644	0.15	0.00	0.35
naf	INR mm	16,642	0.72	0.20	1.62
naf_dum	Dummy	16,642	0.67	1.00	0.47
nsales	INR mm	22,644	11,480.54	2,229.45	39,318.16
nsalesgr	#	22,151	0.15	0.14	0.38
psu	Dummy	22,644	0.04	0.00	0.18
roa	#	22,644	0.05	0.04	0.08
seg	#	22,644	2.38	1.00	3.12
ta	INR mm	22,644	15,866.97	2,658.45	56,807.46
tobinq	#	20,009	2.07	1.09	2.96
Panel B: Auditor characteristics					
big4	Dummy	22,644	0.25	0.00	0.43
initiate	Dummy	22,644	0.10	0.00	0.30
special	Dummy	22,644	0.15	0.00	0.36
tenure	Years	22,644	7.96	6.00	5.98

Table III.
Descriptive statistics

Interestingly, we do not observe any significant difference between the board characteristics of financially distressed and non-distressed group of firms in terms of board size, board independence or frequency of CEO–Chairman duality. This possibly suggests that the choice of external auditors tends to play a more important role for a financially distressed firm either in terms of corporate governance mechanism to mitigate the agency costs or in terms of signaling mechanism to enhance the confidence of outside investors regarding the credibility of audited financial statements or in terms of an insurance role in indemnifying the managers and the board members from litigation risks and potential financial losses in the event of bankruptcy or an audit failure. However, the fact that the financially distressed firms are found to incur lower audit fees and employ lower-quality non-Big 4 auditors more frequently relative to the healthier firms raises important questions regarding the motivations and drivers of auditor–auditee relationship in the presence of financial distress in the firm, which we examine and analyze in a multivariate framework in the subsequent section.

6. Results and analysis

Table VI provides the correlation coefficients between firm-level variables and auditor characteristics. The correlation matrix suggests that the audit fees are positively associated with firm size (0.77), number of business segments (0.50) and appointment of Big 4 auditors

Variable	Unit	Large firms Mean	Large firms Median	Small firms Mean	Small firms Median	Difference of mean *t*-statistics	Difference of median *z*-statistics
Firm characteristics							
af	INR mm	2.91	1.50	0.69	0.30	45.99***	64.24***
age	Years	46.90	40.00	36.29	32.00	39.54***	39.48***
bg	Dummy	0.68	1.00	0.41	0.00	43.07***	41.4***
bind	#	0.59	0.56	0.58	0.56	2.55**	2.37**
bsize	#	11.15	11.00	8.89	9.00	40.24***	37.83***
cata	#	0.15	0.02	0.15	0.02	1.70*	0.12
ceod	Dummy	0.43	0.00	0.39	0.00	4.08***	4.08***
fgn	Dummy	0.06	0.00	0.06	0.00	2.87***	2.87***
fii	#	7.20	3.43	2.03	0.00	43.05***	51.39***
fin_dist	Dummy	0.53	1.00	0.48	0.00	6.54***	6.53***
insider	#	52.90	52.65	53.74	54.99	−2.98***	−5.05***
lev	#	0.08	0.00	0.08	0.00	2.37**	2.37**
listing	Dummy	0.03	0.00	0.05	0.00	−7.95***	−7.94***
loss	Dummy	0.12	0.00	0.17	0.00	−9.46***	−9.44***
naf	INR mm	0.92	0.20	0.16	0.00	41.53***	49.42***
naf_dum	Dummy	0.80	1.00	0.52	1.00	38.95***	37.29***
nsales	INR mm	21,211.64	6,250.90	2,148.48	878.8	37.59***	89.97***
nsalesgr	#	0.14	0.13	0.16	0.14	−4.44***	−4.78***
psu	Dummy	0.06	0.00	0.01	0.00	23.47***	23.19***
roa	#	0.05	0.04	0.04	0.04	6.75***	4.45***
seg	#	3.31	1.00	1.49	1.00	45.89***	53.13***
ta	INR mm	29,691.91	7,797.70	2,608.95	958.90	36.93***	99.94***
tobinq	#	2.35	1.26	1.77	0.96	13.93***	20.49***
Auditor Characteristics							
big4	Dummy	0.35	0.00	0.15	0.00	35.87***	34.89***
initiate	Dummy	0.08	0.00	0.12	0.00	−10.21***	−10.18***
special	Dummy	0.22	0.00	0.09	0.00	28.52***	28.03***
tenure	Years	8.63	7.00	7.32	6.00	16.60***	17.48***

Note: *, ** and *** denote statistical significance at 10, 5 and 1% level, respectively

Table IV.
Comparison of descriptive statistics across sub-samples: sub-samples created on the basis of size of firms

(0.49), as also observed in earlier studies (Craswell *et al.*, 1995). Further, the audit fees are positively correlated with auditor specialization (0.37), joint provision of NAS (0.50) and board size of the auditee firms (0.39). The table indicates that the Big 4 auditors often tend to provide specialized auditing services (0.50). We also observe that firms which are relatively less profitable are more likely to be financially distressed (–0.15). Finally, consistent with our univariate results, we note that financially distressed firms are less likely to hire Big 4 (–0.15) or specialist (–0.08) auditors or auditors jointly providing NAS (–0.08) and more likely to pay lower audit fees (–0.12) to their auditors.

6.1 Determinants of audit fee

On the examination of the audit fee determinants for our sample of Indian firms (Table VII), we discern that the appointment of a Big 4 auditor is positively associated with the magnitude of the audit fees. The regression coefficient of the Big 4 auditor dummy variable ranges between 0.55 and 0.87 across different audit fee models, revealing that engaging a Big 4 auditor increases the audit fee of an average firm by an amount ranging between INR 1.7 million (93 per cent increase) and INR 2.4 million (131 per cent increase). The results

Variable	Unit	Distressed firms Mean	Distressed firms Median	Non-distressed firms Mean	Non-distressed firms Median	Difference of mean *t*-statistics	Difference of median z-statistics
Firm characteristics							
af	INR mm	1.90	0.80	2.34	1.10	−7.15***	−13.42***
age	Years	42.10	35.00	42.41	34.00	−0.94	−2.15**
bg	Dummy	0.61	1.00	0.54	1.00	8.76***	8.74***
bind	#	0.59	0.56	0.58	0.55	1.83*	2.77***
bsize	#	10.17	10.00	10.28	10.00	−1.63	−1.22
cata	#	0.14	0.02	0.21	0.04	−17.7***	−13.78***
ceod	Dummy	0.43	0.00	0.41	0.00	1.18	1.18
fgn	Dummy	0.03	0.00	0.10	0.00	−18.83***	−18.63***
fii	#	4.32	0.25	5.86	1.61	−11.04***	−12.99***
fin_dist	Dummy	1.00	1.00	0.00	0.00	–	–
insider	#	51.00	51.50	56.12	56.40	−17.54***	−17.70***
lev	#	0.12	0.00	0.07	0.00	18.42***	6.69***
listing	Dummy	0.03	0.00	0.05	0.00	−6.23***	−6.23***
loss	Dummy	0.25	0.00	0.02	0.00	45.44***	42.86***
naf	INR mm	0.59	0.10	0.75	0.20	−6.69***	−11.11***
naf_dum	Dummy	0.70	1.00	0.76	1.00	−8.87***	−8.85***
nsales	INR mm	9,826.55	2,362.30	17,692.08	4,132.50	−11.77***	−21.88***
nsalesgr	#	0.08	0.09	0.19	0.16	−19.72***	−25.73***
psu	Dummy	0.03	0.00	0.03	0.00	−0.49	−0.49
roa	#	0.01	0.02	0.09	0.08	−76.29***	−77.00***
seg	#	2.89	1.00	2.47	1.00	7.69***	7.69***
ta	INR mm	20,292.36	4,076.00	17,543.24	3,471.10	−2.84***	6.92***
tobinq	#	1.15	0.80	3.09	1.99	−45.01***	−63.98***
Auditor characteristics							
big4	Dummy	0.21	0.00	0.35	0.00	−19.69***	−19.47***
initiate	Dummy	0.07	0.00	0.08	0.00	−1.50	−1.50
special	Dummy	0.14	0.00	0.20	0.00	−9.89***	−9.87***
tenure	Years	8.90	8.00	8.81	7.00	0.94	3.03***

Note: *, ** and *** denote statistical significance at 10, 5 and 1% level, respectively

Table V.
Comparison of descriptive statistics across sub-samples: sub-samples created on the basis of financial health of firms

strongly support the existence of a Big 4 audit fee premium in the Indian audit services market (*H1a*), in agreement with the previous findings on audit markets of developed (Palmrose, 1986; Craswell *et al.*, 1995) as well as emerging (Pratoomsuwan, 2017) economies.

We also observe that the coefficients of dummy variables denoting the industry specialization of auditors and joint provision of NAS in the audit fee regression models are positive and highly significant. The estimates affirm that on an average, an auditor tends to increase the audit fees by INR 1.3 million (71 per cent higher) if the auditor is also an industry specialist and by INR 1.4 million (77 per cent higher) for the joint provision of NAS. The empirical findings strongly support our hypotheses on the existence of an audit fee premium for auditor industry specialization (*H1b*) and joint provision of NAS (*H1c*) in the Indian audit services market. Both the results are in line with the conclusions of previous studies on audit fee pricing in developed (DeFond *et al.*, 2000; Carson, 2009; Niemi, 2005) and emerging (Lin and Liu, 2009; Khan *et al.*, 2015; Pratoomsuwan, 2017) markets.

Further, we observe that the coefficient of financial distress dummy variable is negative and highly significant in all the regression models, supporting our proposition that auditors charge reduced audit fees if the firms are undergoing financial distress (*H1d*). The results

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) log_af	1	0.77***	0.17***	0.50***	0.11***	0.18***	0.49***	−0.11***	0.11***	0.37***	0.50***	0.39***
(2) log_ta	0.76***	1	0.17***	0.49***	0.04***	0.26***	0.26***	0.05***	0.26***	0.23***	0.44***	0.48***
(3) log_age	0.17***	0.18***	1	0.04***	0.05***	−0.15***	0.19***	−0.02**	0.18***	0.05***	0.16***	0.22***
(4) log_seg	0.47***	0.47***	0.04***	1	0.02**	0.15***	0.22***	0.06***	0.14***	0.21***	0.22***	0.21***
(5) roa	0.1***	0.01	0.05***	0	1	−0.25***	0.11***	−0.51***	−0.02***	0.06***	0.08***	0.13***
(6) lev	0.28***	0.33***	−0.16***	0.21***	−0.18***	1	−0.06***	0.14***	0.16***	−0.02***	0.11***	−0.04***
(7) big4	0.49***	0.26***	0.18***	0.21***	0.11***	−0.02***	1	−0.15***	−0.03***	0.50***	0.24***	0.20***
(8) fin_dist	−0.12***	0.05***	−0.02**	0.06***	−0.60***	0.05***	−0.15***	1	0.02***	−0.08***	−0.08***	−0.02*
(9) log_tenure	0.12***	0.28***	0.19***	0.15***	−0.04***	0.21***	−0.03***	0.02***	1	−0.03***	0.17***	0.06***
(10) Special	0.36***	0.23***	0.05***	0.18***	0.07***	0.02**	0.50***	−0.08***	−0.04***	1	0.17***	0.14***
(11) naf_dum	0.50***	0.45***	0.16***	0.24***	0.07***	0.17***	0.24***	−0.08***	0.18***	0.17***	1	0.23***
(12) log_bsize	0.39***	0.46***	0.23***	0.22***	0.12***	−0.02**	0.20***	−0.01	0.08***	0.14***	0.22***	1

Note: *, ** and *** denote statistical significance at 10, 5 and 1% level, respectively

Table VI.
Correlation matrix

Table VII.
Determinants of audit fee for full sample

Dependent variable	log_af	log_af	log_af	log_af
Model #	(1)	(2)	(3)	(4)
Sample set	All firms	All firms	All firms	All firms
big4	*0.87*** (63.35; 1.22)*	*0.74*** (43.49; 1.72)*	*0.61*** (34.98; 1.93)*	*0.55*** (25.39; 2.03)*
special		*0.24*** (13.61; 1.57)*	*0.22*** (12.04; 1.63)*	*0.25*** (11.19; 1.75)*
naf_dum			*0.30*** (18.00; 1.31)*	*0.33*** (15.91; 1.25)*
fin_dist		*−0.16*** (−10.22; 1.69)*	*−0.15*** (−10.19; 1.71)*	*−0.14*** (−7.67; 1.70)*
log_ta	0.48*** (98.54; 1.92)	0.48*** (91.31; 1.94)	0.48*** (74.27; 2.80)	0.46*** (56.31; 2.89)
log_age	0.13*** (9.49; 1.33)	0.13*** (8.82; 1.44)	0.11*** (7.43; 1.52)	0.07*** (3.94; 1.50)
log_seg	0.23*** (20.26; 1.56)	0.22*** (18.49; 1.57)	0.16*** (13.15; 1.70)	0.17*** (11.70; 1.75)
cata	−0.05 (−1.13; 4.73)	−0.13** (−2.53; 4.84)	−0.07 (−1.46; 4.77)	−0.08 (−1.31; 4.91)
roa	0.42*** (4.43; 2.10)	0.13 (1.17; 2.36)	−0.07 (−0.63; 2.39)	−0.09 (−0.63; 2.41)
loss	−0.02 (−0.93; 1.85)	0.02 (0.76; 1.82)	0.01 (0.59; 1.82)	0.02 (0.81; 1.78)
lev	−0.06 (−1.40; 2.44)	−0.04 (−0.93; 2.53)	−0.01 (−0.21; 2.55)	−0.05 (−0.80; 2.73)
nsalesgr	−0.04** (−1.96; 1.17)	−0.05** (−2.13; 1.17)	−0.04* (−1.83; 1.17)	−0.05** (−2.10; 1.17)
tobinq	0.03*** (10.63; 1.28)	0.02*** (8.59; 1.36)	0.02*** (8.62; 1.44)	0.02*** (6.04; 1.44)
gfc		1.21*** (4.45; 1.06)	0.16*** (3.24; 1.08)	0.53*** (3.55; 1.12)
initiate		0.08*** (2.64; 1.51)	0.04 (1.26; 1.49)	0.06 (1.56; 1.47)
log_tenure		0.04*** (3.88; 1.76)	−0.02* (−1.65; 1.84)	0.01 (0.42; 1.81)
bg			0.09*** (6.18; 1.60)	0.08*** (4.54; 1.53)
psu			−0.64*** (−14.02; 1.72)	−0.65*** (−9.72; 1.49)
fgn			0.35*** (13.80; 1.38)	0.36*** (9.90; 1.25)
insider			−0.04 (−1.04; 1.32)	−0.03 (−0.56; 1.31)
fii			0.51*** (5.26; 1.75)	0.61*** (5.69; 1.77)
log_bsize				0.23*** (8.00; 1.41)
bind				−0.04 (−0.82; 1.36)
ceod				−0.00 (−0.21; 1.09)
Constant	−6.32*** (−24.50)	−6.56*** (−23.35)	−5.54*** (−59.89)	−6.08*** (−33.24)
Industry and Year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.74	0.74	0.75	0.75
Observations	14,751	13,178	12,345	8,165

Notes: This table reports coefficients of the parameters from auditor fee model (Model A), estimated using pooled OLS regression with industry and firm fixed effects, for full sample data; *, ** and *** denote statistical significance at 10, 5 and 1% level, respectively. The numbers in the parentheses denote the *t*-statistic and the variance inflation factor (VIF) values of the estimated coefficient

indicate that the audit fees of financially distressed firms are on an average INR 0.9 million (or 49 per cent) lower than their healthy peers. The audit fee differential could be driven by lower-quality audit demand from the distressed firms, either to reduce the audit fee burden or to ensure less stringent monitoring and governance mechanisms by reducing both the quality and magnitude of auditing efforts and deliberately weakening the supervisory oversight by the external auditors. Alternately, the lower audit fees might also reflect the fee discounts extended by the auditors to their distressed clients, possibly to retain the business and continue the relationship.

In either case, this practice raises serious concerns about the audit quality of financial reports produced by the distressed firms. Such organizations have greater incentives as well as higher opportunities for manipulating their earnings and committing financial frauds because of the simultaneous presence of financial distress in the firm and lower-quality external audit services. However, the coefficient of loss dummy is statistically insignificant in all the models. This result signifies that firms tend to demand lower-quality audit not necessarily when they are incurring losses but only during times of financial distress. Alternately, this may also suggest that auditors do not provide such audit fee discounts to a loss-making firm unless they are also financially distressed.

We also observe that the audit fees are higher for firms that are larger, older and more complex. The audit fees tend to be greater for firms with business group affiliation or foreign ownership and lower for public sector enterprises. The results denote that establishments with higher foreign institutional ownership and larger board sizes tend to pay higher audit fees, presumably for enhancing the auditing services quality. Our findings are in line with earlier literature suggesting the significant impact of ownership structures on audit fees as they tend to affect the internal agency conflicts of the auditee firm (O'Sullivan and Diacon, 2002; Hay *et al.*, 2006; Khan *et al.*, 2015; Darmadi, 2016).

Table VIII presents the results of audit fee regression for different sub-samples based on firm size or the presence of financial distress. We observe that the Big 4 audit fee premium exists for both small and large client segments, and it is higher for small client segment. On the other hand, the industry specialization audit fee premium is highest for financially distressed firms and lowest for the smaller sized firms. Besides, we note that auditors charge higher premium for the joint provision of NAS to larger (above-median-sized) clients. Our empirical results are in line with previous studies which suggest that the audit fee premiums for Big 4 status, industry specialization and joint provision of NAS tend to vary with the auditee firm characteristics (Simunic, 1980; Francis, 1984; Causholli *et al.*, 2010).

Our positive findings on the existence of audit fee differential seem to suggest that an audit quality-based differentiation exists in the Indian audit market based on size, reputation and industry specialization of the auditors. Our results are consistent with the findings of earlier studies on audit fee differential in the audit markets of developed (Francis, 2004) as well as developing (Pratoomsuwan, 2017) economies. On the other hand, our results on audit fee discounts received by financially distressed firms seem to negate audit fee predictions based on either signaling or insurance role of auditors and underscore the risk of agency cost aggravation at the time of financial distress particularly in the presence of weak and inefficient corporate governance mechanisms.

To further explore the effects of financial distress on audit fee pricing, we present the regression results of audit fee model after including the interaction effects of financial distress with several firm and audit characteristics as shown in Table IX. We observe that industry specialist auditors tend to charge an additional audit fee premium when they sign up to audit the books of a financially distressed client. The results seem to suggest that specialist auditors tend to perceive higher audit risk in engaging with financially distressed

Table VIII.
Determinants of audit fee for sub-samples

Dependent variable	log_af	log_af	log_af	log_af
Model #	(1)	(2)	(3)	(4)
Sample set	All firms	Large	Small	Distressed
big4	*0.55*** (25.39; 2.03)*	*0.45*** (17.60; 1.94)*	*0.77*** (18.60; 2.14)*	*0.47*** (13.49; 1.97)*
special	*0.25*** (11.19; 1.75)*	*0.26*** (10.03; 1.67)*	*0.16*** (3.86; 1.91)*	*0.34*** (9.45; 1.77)*
naf_dum	*0.33*** (15.91; 1.25)*	*0.38*** (10.47; 1.16)*	*0.28*** (11.02; 1.25)*	*0.33*** (11.10; 1.28)*
fin_dist	*−0.14*** (−7.67; 1.70)*	*−0.18*** (−7.21; 1.83)*	−0.10*** (−3.54; 1.68)	
log_ta	0.46*** (56.31; 2.89)	0.45*** (34.18; 3.11)	0.43*** (27.75; 2.29)	0.47*** (37.88; 3.10)
log_age	0.07*** (3.94; 1.50)	0.04* (1.73; 1.49)	0.12*** (3.87; 1.54)	0.11*** (3.98; 1.61)
log_seg	0.17*** (11.70; 1.75)	0.18*** (10.50; 1.49)	0.10*** (3.41; 1.39)	0.17*** (8.44; 1.79)
cata	−0.08 (−1.31; 4.91)	−0.04 (−0.53; 5.16)	−0.04 (−0.46; 4.93)	0.01 (0.11; 3.87)
roa	−0.09 (−0.63; 2.41)	0.16 (0.76; 2.63)	−0.07 (−0.34; 2.39)	−0.67*** (−2.67; 2.31)
loss	0.02 (0.81; 1.78)	0.05 (1.27; 1.74)	0.03 (0.67; 1.91)	−0.02 (−0.44; 2.13)
lev	−0.05 (−0.80; 2.73)	−0.10 (−1.15; 3.25)	0.02 (0.27; 2.41)	−0.11 (−1.35; 3.35)
nsalesgr	−0.05** (−2.10; 1.17)	−0.07* (−1.90; 1.18)	−0.05 (−1.34; 1.19)	−0.01 (−0.23; 1.19)
tobinq	0.02*** (6.04; 1.44)	0.02*** (4.81; 1.63)	0.01** (2.27; 1.31)	−0.01 (−1.02; 1.20)
Gfc	0.53*** (3.55; 1.12)	0.42*** (2.77; 1.12)	1.11*** (10.80; 1.14)	0.50*** (2.95; 1.14)
initiate	0.06 (1.56; 1.47)	0.05 (1.01; 1.46)	0.07 (1.42; 1.51)	0.08 (1.45; 1.45)
log_tenure	0.01 (0.42; 1.81)	0.01 (0.41; 1.84)	0.01 (0.32; 1.84)	−0.01 (−0.31; 1.83)
bg	0.08*** (4.54; 1.53)	0.17*** (6.61; 1.65)	−0.03 (−1.18; 1.38)	0.06** (2.09; 1.54)
psu	−0.65*** (−9.72; 1.49)	−0.65*** (−8.63; 1.84)	−0.67*** (−3.33; 1.22)	−0.57*** (−4.65; 1.47)
fgn	0.36*** (9.90; 1.25)	0.37*** (6.93; 1.33)	0.37*** (7.38; 1.28)	0.46*** (6.84; 1.15)
insider	−0.03 (−0.56; 1.31)	−0.05 (−0.70; 1.48)	−0.07 (−1.02; 1.24)	−0.13* (−1.82; 1.30)
fii	0.61*** (5.69; 1.77)	0.57*** (4.41; 1.79)	0.63*** (2.98; 1.32)	0.39** (2.53; 1.60)
log_bsize	0.23*** (8.00; 1.41)	0.27*** (6.96; 1.32)	0.17*** (4.02; 1.21)	0.26*** (5.89; 1.48)
bind	−0.04 (−0.82; 1.36)	−0.01 (−0.18; 1.39)	−0.04 (−0.56; 1.40)	−0.14* (−1.81; 1.42)
ceod	−0.00 (−0.21; 1.09)	−0.02 (−0.85; 1.13)	0.00 (0.03; 1.13)	−0.00 (−0.18; 1.13)
Constant	−6.08*** (−33.24)	−5.87*** (−26.00)	−6.53*** (−33.58)	−6.24*** (−27.60)
Industry and Year FE	Yes	Yes	Yes	Yes
Adjusted R^2	0.75	0.71	0.60	0.73
Observations	8,165	4,511	3,654	4,029

Notes: This table reports coefficients of the parameters from auditor fee model (Model A), estimated using pooled OLS regression with industry and firm fixed effects, for different sub-groups of the sample data; *, ** and *** denote statistical significance at 10, 5 and 1% level, respectively; The numbers in the parentheses denote the *t*-statistic and the variance inflation factor (VIF) values of the estimated coefficient

Table IX.
Audit fee regression results with interaction effects

Dependent variable	log_af	log_af	log_af
Model #	(1)	(2)	(3)
Sample set	All firms	All firms	All firms
big4	0.61*** (22.86; 3.42)	0.55*** (25.43; 2.03)	0.61*** (22.77; 3.44)
special	0.17*** (6.28; 3.01)	0.25*** (11.14; 1.75)	0.17*** (6.18; 3.01)
naf_dum	0.31*** (11.40; 2.50)	0.33*** (15.89; 1.25)	0.31*** (11.20; 2.55)
fin_dist	−0.16*** (−4.55; 5.25)	−0.12*** (−4.27; 3.81)	−0.15*** (−3.90; 6.48)
fin_dist x big4	*−0.13*** (−3.19; 3.46)*		*−0.04 (−0.95; 4.16)*
fin_dist x special	*0.17*** (3.94; 3.23)*		*0.40*** (6.12; 6.57)*
fin_dist x naf_dum	*0.02 (0.65; 5.95)*		*0.03 (0.81; 6.22)*
fin_dist x initiate		*0.08 (1.23; 1.89)*	*0.08 (1.33; 1.90)*
fin_dist x lev		*−0.02 (−0.23; 5.10)*	*−0.02 (−0.29; 5.13)*
fin_dist x bg		*−0.04 (−1.21; 3.66)*	*−0.04 (−1.38; 3.97)*
fin_dist x big4 x special			*−0.35*** (−4.80; 6.64)*
log_ta	0.46*** (56.12; 2.89)	0.46*** (56.26; 2.89)	0.46*** (56.04; 2.89)
log_age	0.07*** (3.83; 1.51)	0.07*** (4.01; 1.51)	0.07*** (3.81; 1.51)
log_seg	0.17*** (11.58; 1.76)	0.17*** (11.69; 1.75)	0.17*** (11.57; 1.76)
cata	−0.07 (−1.29; 4.92)	−0.08 (−1.31; 4.99)	−0.08 (−1.39; 4.99)
roa	−0.10 (−0.68; 2.41)	−0.08 (−0.55; 2.44)	−0.09 (−0.64; 2.45)
loss	0.02 (0.80; 1.78)	0.02 (0.80; 1.81)	0.02 (0.86; 1.81)
lev	−0.05 (−0.90; 2.74)	−0.03 (−0.37; 6.68)	−0.04 (−0.42; 6.70)
nsalesgr	−0.05** (−1.98; 1.17)	−0.05** (−2.04; 1.17)	−0.05* (−1.92; 1.17)
tobinq	0.02*** (5.89; 1.46)	0.02*** (5.92; 1.46)	0.02*** (5.88; 1.47)
gfc	0.54*** (3.61; 1.12)	0.52*** (3.52; 1.12)	0.54*** (3.74; 1.12)
initiate	0.06 (1.52; 1.47)	0.02 (0.53; 2.29)	0.02 (0.38; 2.29)
log_tenure	0.01 (0.48; 1.81)	0.01 (0.43; 1.81)	0.01 (0.42; 1.81)
bg	0.08*** (4.68; 1.53)	0.10*** (4.50; 2.58)	0.10*** (4.71; 2.67)
psu	−0.66*** (−9.80; 1.49)	−0.65*** (−9.71; 1.49)	−0.66*** (−9.97; 1.49)
fgn	0.35*** (9.84; 1.26)	0.36*** (10.05; 1.26)	0.36*** (10.04; 1.28)
insider	−0.03 (−0.60; 1.32)	−0.03 (−0.54; 1.32)	−0.03 (−0.65; 1.32)
fii	0.61*** (5.69; 1.77)	0.61*** (5.67; 1.77)	0.60*** (5.59; 1.77)
log_bsize	0.23*** (7.96; 1.41)	0.23*** (7.98; 1.41)	0.23*** (7.88; 1.41)
bind	−0.04 (−0.89; 1.36)	−0.04 (−0.83; 1.36)	−0.05 (−0.98; 1.36)
ceod	−0.00 (−0.23; 1.09)	−0.00 (−0.21; 1.09)	−0.00 (−0.26; 1.09)
Constant	−6.07*** (−33.01)	−6.09*** (−33.30)	−6.06*** (−33.53)
Industry and Year FE	Yes	Yes	Yes
Adjusted R^2	0.75	0.75	0.75
Observations	8,165	8,165	8,165

Notes: This table reports coefficients of the parameters from auditor fee model (Model A), estimated using pooled OLS regression with interaction effects as well as industry and firm fixed effects, for full sample data; *, ** and *** denote statistical significance at 10, 5 and 1% level, respectively; The numbers in the parentheses denote the *t*-statistic and the variance inflation factor (VIF) values of the estimated coefficient

clients, and the heightened risk perception gets incorporated in their audit pricing decisions. However, the interaction effects also suggest that Big 4 specialists appear to provide an audit fee discount to their financially distressed clients relative to non-Big 4 specialist auditors. This result appears to be consistent with findings of earlier studies which document that larger audit firms may be in comparatively advantageous positions to engage with distressed clients, given the economy of scale benefits which they derive from their greater market shares (Simunic, 1980; Schwartz and Menon, 1985). We further conjecture, as a scope of future work, that this could possibly be also an outcome of price-based competition between Big 4 and non-Big 4 specialist auditors or may indicate their different level of audit risk sensitivity with respect to financial distress conditions in the context of audit pricing decisions.

In sum, we observe that the audit fees are higher when the auditor is one among the Big 4 affiliates, an industry specialist or jointly provides NAS. Further, we offer a new insight: Financially distressed firms may be demanding lower-quality audits either to decrease the audit fee burden or to lower the quality of the audit efforts made by external auditors, highlighting the aggravated agency costs in distress situations when the monitoring and governance mechanisms are relatively weak. Alternatively, auditors may be willing to provide audit fee discounts to retain their clients when they are undergoing financial distress and temporarily lacking the ability to pay the normal audit fees. Moreover, our results based on interaction effects also suggest that the sign and magnitude of audit fee differential for financially distressed firms depend on the joint effects of auditor characteristics, such as Big 4 status and industry specialization. Particularly, we find that specialist auditors affiliated to one of the Big 4 networks are willing to charge lower audit fees to their financially distressed clients relative to the pricing of non-Big 4 specialist auditors.

6.2 Determinants of auditor choice

We investigate various factors that influence the choice of an auditor by an auditee firm (Table X). Specifically, we examine the firm and auditor characteristics that determine the appointment of a Big 4 auditor by an Indian firm. The results show that the board size variable is positive and statistically significant in each of the auditor choice logistic regression models. This trend suggests that auditee firms with larger boards tend to opt for Big 4 auditors in accord with our first hypothesis on board size (*H2a*). The results further assert the monitoring as well as signaling role of higher-quality auditors in the alleviation of principal–agent agency conflicts which may otherwise exacerbate in the presence of operational inefficiencies of larger boards.

The logistic regression results on auditor choice also denote that auditee firms with greater board independence tend to appoint a Big 4 auditor, consistent with our hypothesis (*H2b*) on the stronger incentives of independent board of directors in safeguarding their reputational capital and legal risk exposures (Bliss, 2011), consistent with the insurance role-based demand of auditors. The results also support agency theory-based explanations, whereby board independence acts as one of the tools of corporate governance mechanism to mitigate the agency risks embedded in the ownership structure of the firm as also observed in other emerging markets (Khan *et al.*, 2015; Darmadi, 2016). On the contrary, we note that the coefficient of dummy variables on CEO–Chair duality and financial distress are both negative and statistically significant, supporting our propositions that the auditee firms with CEO–Chair duality (*H2c*) or financial distress (*H2d*) have significantly lower chances of appointing reputable Big 4 auditors. Our results are consistent with findings of previous studies on other emerging markets such as Bangladesh (Karim *et al.*, 2013) and China (Lin

Table X.
Determinants of auditor choice

Dependent variable	big4	big4	big4	big4
Model #	(1)	(2)	(3)	(4)
Sample set	All firms	Large	Small	Distressed
log_bsize	*0.58*** (4.90; 1.33)*	*0.52*** (3.46; 1.22)*	*0.70*** (3.11; 1.13)*	*0.73*** (3.96; 1.37)*
bind	*0.45** (2.26; 1.11)*	*0.10 (0.41; 1.11)*	*1.21*** (3.38; 1.13)*	*0.10 (0.29; 1.13)*
ceod	*−0.44*** (−7.27; 1.03)*	*−0.44*** (−5.70; 1.05)*	*−0.47*** (−4.06; 1.04)*	*−0.57*** (−5.82; 1.05)*
fin_dist	*−0.41*** (−5.43; 1.57)*	−0.37*** (−3.87; 1.66)	−0.37*** (−2.70; 1.51)	
log_ta	0.31*** (9.05; 2.37)	0.27*** (5.15; 1.98)	0.46*** (5.10; 1.52)	0.22*** (4.23; 2.33)
log_age	0.47*** (6.28; 1.23)	0.31*** (3.39; 1.20)	0.83*** (5.34; 1.20)	0.44*** (3.68; 1.27)
log_seg	0.36*** (6.19; 1.48)	0.36*** (5.25; 1.41)	0.58*** (4.18; 1.12)	0.54*** (6.14; 1.46)
cata	−0.65*** (−2.60; 1.66)	−0.54 (−1.56; 1.73)	−1.22*** (−2.97; 1.64)	−0.16 (−0.42; 1.84)
listing	0.25 (1.43; 1.07)	0.41* (1.69; 1.07)	0.02 (0.07; 1.08)	0.82*** (2.69; 1.06)
roa	−0.32 (−0.53; 2.25)	1.33 (1.57; 2.30)	−1.83* (−1.88; 2.28)	−1.67 (−1.48; 2.19)
loss	0.18 (1.52; 1.72)	0.47*** (3.02; 1.62)	−0.18 (−0.75; 1.84)	−0.00 (−0.00; 2.02)
lev	−1.44*** (−5.68; 1.87)	−2.10*** (−6.05; 1.99)	−0.56 (−1.39; 1.77)	−1.53*** (−4.22; 2.07)
nsalesgr	−0.23** (−2.22; 1.13)	−0.16 (−1.21; 1.12)	−0.25 (−1.36; 1.15)	0.04 (0.28; 1.15)
tobinq	0.05*** (3.23; 1.33)	−0.00 (−0.00; 1.47)	0.11*** (4.54; 1.19)	0.05* (1.92; 1.08)
naf_dum	1.20*** (12.06; 1.18)	1.01*** (7.20; 1.08)	1.41*** (8.90; 1.15)	1.33*** (8.26; 1.20)
bg	0.33*** (4.48; 1.43)	0.24** (2.47; 1.47)	0.59*** (4.67; 1.23)	0.64*** (5.31; 1.41)
psu	−2.92*** (−6.74; 1.24)	−3.61*** (−5.18; 1.47)	0.18 (0.30; 1.05)	0.00 (0.28; 1.27)
fgn	1.78*** (11.93; 1.15)	2.05*** (8.67; 1.22)	1.76*** (7.44; 1.11)	1.15*** (3.77; 1.06)
insider	0.71*** (3.21; 1.23)	0.68** (2.47; 1.34)	0.86** (2.19; 1.15)	1.24*** (3.81; 1.19)
fii	1.58*** (3.55; 1.68)	1.90*** (3.75; 1.66)	0.06 (0.05; 1.22)	2.70*** (3.97; 1.49)
Constant	−9.66*** (−8.11)	−8.73*** (−7.03)	−12.40*** (−11.53)	−9.15*** (−7.98)
Industry and Year FE	Yes	Yes	Yes	Yes
Pseudo R^2	0.24	0.21	0.26	0.25
Observations	8,107	4,431	3,371	3,889

Notes: This table reports coefficients of the parameters from auditor choice model (Model B), estimated using pooled logistic regression with industry and firm fixed effects *, ** and *** denote statistical significance at 10, 5 and 1% level, respectively; The numbers in the parentheses denote the *t*-statistic and the variance inflation factor (VIF) values of the estimated coefficient

and Liu, 2009), which also document significant influence of corporate governance attributes such as CEO–Chair separation on the auditor choice decisions of firms.

Prior works suggest that corporate governance factors influence the audit fees because of a more effective control environment (Carcello *et al.*, 2002). Aksu *et al.* (2007) examine the Turkish audit market and suggest that the strength of the legal and institutional structure of the local audit market may influence the relationship between corporate governance mechanisms adopted by a firm and its auditor selection decisions. The tendency of family-controlled firms to choose lower-quality auditors to gain private benefits obtained from weaker monitoring mechanisms and ineffective corporate governance standards have been documented in audit markets of other emerging economies such as Bangladesh (Khan *et al.*, 2015) and Indonesia (Darmadi, 2016). We contribute to this audit literature by documenting the higher propensity of financially distressed firms in India to choose non-Big 4 auditors either to decrease their audit fees or to lower the audit quality and monitoring mechanisms to capture the subsequent opaqueness gains.

Among the remaining control variables, we find that larger, older and more complex firms are more likely to appoint a Big 4 auditor. Similarly, those with business group affiliation or foreign ownership also tend to choose a Big 4 auditor. Further, organizations are more inclined toward appointing a Big 4 auditor when they are also jointly seeking NAS from the auditor.

We estimate the chances of selecting a Big 4 auditor using a logistic regression model to study the effects of board characteristics and financial distress on auditor selection. The results assert that one standard deviation increase in the board size and board independence from their mean levels increases the likelihood of appointing a Big 4 auditor from 6.6 per cent to 7.7 per cent and 7.1 per cent, respectively. Nonetheless, the presence of CEO duality and financial distress reduces the chances of appointing a Big 4 auditor from 6.6 per cent to 5.2 per cent and 5.4 per cent, respectively.

We also examine the auditor choice regression results obtained from sub-sample analysis of firms based on firm size (see Columns 2 and 3 in Table X) and the presence of financial distress (see Column 4 in Table X). We find that the effect of board size on the chances of selecting a Big 4 auditor is stronger for smaller firms and those undergoing financial distress. The impact of board independence on the selection of a Big 4 auditor is also more prominent for smaller firms though the effect is statistically insignificant for financially distressed ones. Finally, the effect of CEO duality on auditor selection does not appear to vary significantly with the size of the auditee firm although it considerably reduces the chances of choosing a Big 4 auditor for firms undergoing financial distress.

We also investigate the joint effects of corporate governance attributes and financial distress situations on the auditor choice decision of a firm by including the interaction effects of board characteristics with the presence of financial distress in a firm in our auditor choice regression models. Table XI presents the auditor choice regression results after incorporating the interaction effects. We observe that the presence of large boards and CEO–Chair separation significantly increases the likelihood of a Big 4 auditor selection in a financially distressed firm. However, other interaction effects between the board characteristics do not appear to significantly influence the auditor choice decisions of a firm.

In summary, our results suggest that firms with larger and more independent boards are more likely to choose a Big 4 auditor, and the likelihood of Big 4 auditor selection reduces in the presence of CEO duality or financial distress. However, the propensity of financially distressed firms to appoint a non-Big 4 auditor decreases in the presence of larger boards with CEO–Chair separation. This finding has special relevance for the capital market regulators of emerging economies in ensuring stricter compliance with the prescribed

Table XI. Auditor choice regression results with interaction effects

Dependent variable	Big4	Big4	Big4
Model #	(1)	(2)	(3)
Sample set	All firms	All firms	All firms
log_bsize	0.44*** (3.21; 1.73)	0.55*** (3.82; 1.82)	0.45*** (2.93; 2.03)
bind	0.47** (2.12; 1.35)	0.39 (1.55; 1.50)	0.47* (1.78; 1.62)
ceod	−0.33*** (−4.07; 2.03)	−0.47*** (−4.01; 3.34)	−0.36** (−2.56; 5.00)
fin_dist	−0.48*** (−3.59; 4.33)	−0.41*** (−5.43; 1.57)	−0.48*** (−3.40; 5.00)
fin_dist x bsize	*0.24** (2.14; 2.51)*		*0.25** (2.09; 2.97)*
fin_dist x bind	*−0.01 (−0.14; 2.10)*		*−0.02 (−0.16; 2.71)*
fin_dist x ceod	*−0.25** (−2.07; 2.77)*		*−0.26** (−2.06; 2.77)*
bsize x bind		*0.03 (0.35; 1.92)*	*−0.02 (−0.16; 2.91)*
bsize x ceod		*0.03 (0.24; 2.60)*	*−0.00 (−0.00; 5.29)*
bind x ceod		*0.02 (0.16; 2.39)*	*0.04 (0.23; 5.08)*
bsize x bind x ceod			*0.01 (0.05; 6.69)*
log_ta	0.31*** (9.04; 2.37)	0.31*** (9.04; 2.37)	0.31*** (9.04; 2.37)
log_age	0.48*** (6.32; 1.24)	0.47*** (6.27; 1.23)	0.48*** (6.33; 1.24)
log_seg	0.36*** (6.19; 1.49)	0.36*** (6.17; 1.49)	0.36*** (6.18; 1.49)
cata	−0.65*** (−2.58; 1.68)	−0.65*** (−2.59; 1.68)	−0.65** (−2.57; 1.69)
listing	0.25 (1.43; 1.07)	0.25 (1.42; 1.07)	0.25 (1.43; 1.07)
roa	−0.32 (−0.52; 2.26)	−0.32 (−0.53; 2.26)	−0.32 (−0.53; 2.26)
loss	0.19 (1.56; 1.72)	0.18 (1.52; 1.72)	0.19 (1.56; 1.72)
lev	−1.44*** (−5.65; 1.87)	−1.45*** (−5.69; 1.87)	−1.45*** (−5.66; 1.87)
nsalesgr	−0.24** (−2.26; 1.13)	−0.23** (−2.21; 1.13)	−0.24** (−2.27; 1.13)
Tobinq	0.05*** (3.28; 1.33)	0.05*** (3.25; 1.33)	0.05*** (3.27; 1.33)
naf_dum	1.19*** (11.94; 1.19)	1.20*** (12.03; 1.19)	1.19*** (11.94; 1.19)
bg	0.33*** (4.49; 1.43)	0.33*** (4.48; 1.43)	0.33*** (4.47; 1.43)
psu	−2.88*** (−6.64; 1.25)	−2.91*** (−6.69; 1.25)	−2.88*** (−6.60; 1.26)
fgn	1.77*** (11.90; 1.15)	1.78*** (11.93; 1.15)	1.77*** (11.89; 1.15)
insider	0.70*** (3.14; 1.24)	0.71*** (3.22; 1.24)	0.69*** (3.13; 1.24)
fii	1.57*** (3.51; 1.69)	1.58*** (3.55; 1.68)	1.56*** (3.49; 1.69)
Constant	−9.41*** (−7.83)	−9.57*** (−7.91)	−9.42*** (−7.75)
Industry and Year FE	Yes	Yes	Yes
Pseudo R^2	0.24	0.24	0.24
Observations	8,107	8,107	8,107

Notes: This table reports coefficients of the parameters from auditor choice model (Model B), estimated using pooled logistic regression with interaction effects as well as industry and firm fixed effects; *, ** and *** denote statistical significance at 10, 5 and 1% level, respectively. The numbers in the parentheses denote the *t*-statistic and the variance inflation factor (VIF) values of the estimated coefficient

corporate governance requirements, particularly with respect to CEO–Chair separation in the board. In this regard, our results provide valuable insights for emerging market regulators and investors in devising suitable corporate governance mechanisms for firms where agency costs are exacerbated by financial distress situations and opaqueness gains of entrenched managers and controlling shareholders from ineffective and weaker monitoring mechanisms are significantly large.

As we examine the impact of financial distress on auditor–client relationship with respect to audit pricing and auditor choice decisions, it is pertinent for us to also investigate the duration of financial distress and its likely effects on auditor switching decisions and consequential audit fee revisions. Schwartz and Menon (1985) suggest that there are greater incentives for a distressed firm to switch auditors, either to reduce audit fees or to solicit co-insurance benefits depending on the direction of the switch. Landsman *et al.* (2009) study the portfolio rebalancing strategies of Big N auditors in the aftermath of Enron scandal and find that auditor switching decisions are linked with client-specific audit and financial risk factors. Thahir Abdul Nasser *et al.* (2006) examine the Malaysian audit market and find that financially distressed firms are more likely to switch their auditors, and the direction of switch may depend on the type of audit firm. Therefore, we also examine the effects of prolonged periods of financial distress on auditor–client relationships and audit fee renegotiations in Indian audit environment.

Tables XII and XIII and Figure 2 present the details of audit fee changes with respect to duration of financial distress (Table XII) and direction of auditor switch (Table XIII) and the year-wise distribution of distressed and non-distressed firms as per their auditor choice (Figure 2). We find that around 167 firms undergo financial distress for one to two years, and their audit fee increases by around 52 per cent on the year of recovery from distress. However, the audit fee hikes appear to be much lower, when the firm is recovering from distress situation after a longer period of time. One plausible explanation could be that firms undergoing financial distress for a longer duration are relatively less inclined to significantly increase their fee burden immediately after their recovery as a precautionary measure. Additional work may be done in future to examine the audit fee revision patterns of distressed firms in the subsequent years after their initial recovery from financial distress.

Table XII.
Financial distress, audit fee and auditor choice: change in audit fee in the year of recovery from financial distress

Quartile	Duration of financial distress (# of successive years)	# of firms	% increase in audit fee (in the year of recovery)
1	Between 1 and 2	167	52.48
2	Between 3 and 4	159	12.93
3	Between 5 and 7	152	18.40
4	Above 8	104	21.30

Table XIII.
Financial distress, audit fee and auditor choice: change in auditor in the year of recovery from financial distress

Group	Change in auditor (in the year of recovery from financial distress)	# of firms	% Change in audit fee (in the year of recovery)
1	Changed from non-Big 4 to Big 4	10	465.54
2	Changed from Big 4 to non-Big 4	5	(19.69)
3	No change: Non-Big 4 is retained	440	20.78
4	No change: Big 4 is retained	127	16.80

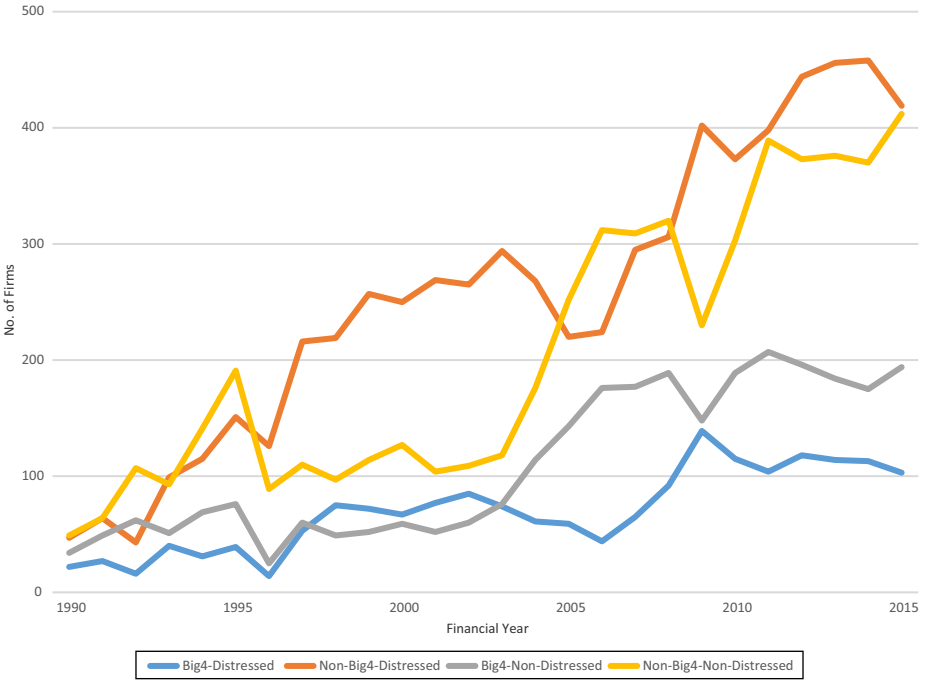


Figure 2. Financial distress, audit fee and auditor choice: Year-wise distribution of distressed and non-distressed firms as per their auditor choice

Interestingly, we find that most of the firms which have undergone a period of financial distress in our sample exhibit a preference to retain their auditors in their recovery years, and the audit fees are revised upwards by around 21 per cent for non-Big 4 auditors and 17 per cent for Big 4 auditors. These results suggest that the effect of financial distress on audit pricing and auditor choice mechanisms documented by us earlier are unlikely to be driven by auditor switching decisions of firms in the years of their recovery from distress. The chart in Panel C further suggests that financially distressed firms tend to prefer appointing non-Big 4 auditors, consistent with our earlier observations.

7. Robustness check

As a robustness check, we run various additional tests. First, in view of the considerable debate in the audit literature on the operationalization of proxy for an auditor's industry specialization, we define two additional dummy variables:

(1) The first one (SPECIAL2) takes the value of one if the industry-year rank of the auditor is among the top two on the basis of net-sales-based market share and zero otherwise.

(2) The second one (SPECIAL3) assumes the value of one if the industry-year rank of the auditor is among the top two on the basis of total-assets-based market share and zero otherwise.

Second, to capture the audit fee discount commonly provided to new clients during the initial years of auditing (commonly referred to as "low-balling"), we create an alternative dummy variable (INITIATE2) which takes the value of one if the length of auditee–auditor association is less than or equal to two years and zero otherwise. Third, to account for the busyness of auditors, we include a busy season dummy (BUSY) that takes the value of one if the financial year end of the auditee firm is in March and zero otherwise[6]. We re-run our audit fees regression models after including the newly defined variables on auditor characteristics. The results for all our hypotheses variables remain qualitatively unchanged.

Further, we incorporate several sensitivity tests by adding new variables or replacing the existing ones on auditee characteristics that have been reported to affect the audit fees and auditor selection in the previous studies. First, we redefine one of the variables on business complexity as the square root of the number of business verticals (SQRT_SEG) to control for auditee firm complexity. Second, we also include the current ratio (CURR), defined as current assets scaled by current liabilities, and quick ratio (QUICK), defined as current assets minus inventories scaled by current liabilities, to control for intrinsic business risk factors. Third, we incorporate a dummy variable on overseas listing (OVSL), which takes the value of one if the auditee firm is listed overseas and zero otherwise, to control for the influence of dual capital market regulations and corporate governance requirements. Fourth, we include variables measuring lagged one year stock return (LAG_STK_RET) and stock volatility (LAG_STK_VOL) to capture the capital market perceptions on the systematic risk factors of the auditee firms. Finally, we replace the dummy variable on the joint provision of NAS with natural logarithm of non-audit fees (LOG_NAF) to avoid forced conversion of a continuous variable into a dichotomous measure. We re-estimate the audit fee and auditor choice regression models using the newly defined variables on firm characteristics. However, we fail to notice any significant qualitative differences in our results[7].

8. Conclusion

Audit fee pricing mechanism and auditor selection are among the most important and extensively researched topics in the audit literature. External auditors can improve the governance standards of a firm by improving the credibility of accounting information contained in the financial statements prepared for outside investors (Knechel *et al.*, 2008). External audits also help in mitigating internal agency conflicts in a firm by lowering the information asymmetry that exists between the inside managers and outside owners. In the audit fee literature, previous works suggest that the audit fees are related to client size, operational and organizational complexity and auditor–client risk sharing. Moreover, auditor choice literature finds that a combination of attributes pertaining to the potential auditor and auditee firm, as well as the structure of the audit market, influences the auditor selection process (Beattie and Fearnley, 1995). In our paper, we contribute to these two streams of audit literature by exploring various factors that determine the audit fee and auditor choice of a firm in the context of a developing economy.

Over three decades of research in auditing literature has provided us with a well-established set of variables, such as firm size, audit complexity and audit risk, which influence the audit fees and auditor choices of a firm. However, Hay *et al.* (2006) highlight three important areas of literature gap and call for additional research to:

- investigate the circumstances in which a firm demands enhanced audit quality and bears higher audit expenses;
- explore the association between audit fees and joint provision of audit and NAS; and

- examine how the governance and regulatory environment of a firm affect the audit services market.

In our paper, we document empirical evidences on various factors influencing the audit fees and auditor selection of firms in the Indian audit market, which add to each of these three dimensions of audit literature gaps. First, we notice that an audit fee premium prevails if the auditors are affiliated to any Big 4 auditor, have industry specialization as measured by leading audit market shares or jointly provide auditing and NAS to the auditee firm. Second, in the auditor choice analysis, we observe that board characteristics, such as size, independence and CEO–Chair separation, increase the chances of selection of a Big 4 auditor by the firm.

Finally, we observe that financially distressed firms are more likely to pay lower audit fees and are less likely to opt for Big 4 auditors. Our results also suggest that the sign and magnitude of audit fee differential for financially distressed firms depend on the joint effects of auditor characteristics, such as Big 4 status and industry specialization. We also find that the presence of large boards and CEO–Chair separation significantly increases the likelihood of a Big 4 auditor selection in a financially distressed firm. Moreover, there is a significant upward revision of audit fees in the financially distressed firms in the year of their recovery from financial distress. It is interesting to note that our study is one of the first to examine the association of financial distress conditions in a firm with its auditor pricing and auditor choice decisions, particularly in the context of a developing economy.

Our empirical results have strong implications for practitioners, regulators and investors. First, Indian regulators may stress more on CEO–Chairman separation to increase the demand for higher quality auditing services. Second, the regulators may try to ensure that the firms strictly adhere to the guidelines on minimum percentage of independent board of directors, which may increase the chances of appointing Big 4 auditors. Third, as the audit fees tend to increase when the auditor is jointly providing NAS, it raises serious concerns about the credibility of the audited financial statements because of the perception of diminished auditor independence. Finally, Indian regulators and outside investors should be wary of the empirical evidence documented in our paper, which suggests that firms undergoing financial distress are more inclined to appoint non-Big 4 auditors and tend to pay relatively lower audit fees, thereby increasing the risks of financial fraud and earnings manipulation. Future researchers should carefully evaluate these important governance and monitoring issues existing in the audit services market which are of considerable concern to the regulators and investors.

Our study has some potential limitations. First, just as firms choose their auditors, the auditors may also endogenously select their potential auditee clients. Hence, the examination of auditor choice determinants using simultaneous equation models that controls for both demand and supply forces of the audit market may be able to provide more robust results.

Second, we could not include few relevant variables on audit committee characteristics and types of audit opinion because of lack to access to those data sets. Incorporation of these additional variables may enrich our insights into the audit pricing and auditor choice mechanisms of Indian firms. A survey study on auditor switching patterns and effect of type of audit opinions on auditor selection decisions of firms would also be of great relevance in this regard and may be considered within the scope of future works.

Third, we have adopted the Altman Z-score model (Altman, 1968; Altman, 2000) to identify firms that are undergoing financial distress. However, other alternative and more

advanced techniques and modeling approaches of financial distress prediction (Jones and Hensher, 2004) may also be adopted to improve or stress test our findings.

Finally, we caveat that we have generally referred to Big 4 auditors as higher-quality auditors, as they are more reputable and tend to enjoy an audit fee premium in the Indian audit market. However, Kaawaase *et al.* (2016) fail to observe any significant difference in the audit quality of Big 4 and non-Big 4 audit firms in the audit markets of Uganda. Therefore, future studies may also focus on exploring whether the audit fee premium charged by Big 4 auditors actually leads to higher audit quality and better compliance with laws, regulations and accounting standards in the Indian audit market environment.

Notes

1. We use the terms "Big 4 auditors" and "Big 4 affiliated auditors" interchangeably and do not make any distinction between these two terms in our paper.
2. In the Z-score model mentioned above, WC is Working Capital, TA is Total Assets, RE is Retained Earnings, EBIT is Earnings before Interest and Tax, MVE is Market Value of Equity, BVTL is Book Value of Total Liabilities and NS is Net Sales.
3. The Bombay Stock Exchange (BSE) classifies the listed securities in the equity segment into various groups based on certain parameters. Companies classified under group 'A' and 'B' comprise of the actively traded securities.
4. Our sample period begins from 1990, as the coverage of firms with non-missing financial variables in the CMIE database reduces drastically in the prior years. The sample period ends in 2015, which was the latest financial year data available when we initiated our work on this paper. The sample period spanning across 26 years and a wide range of industries is significantly larger in comparison with most of the other works on Indian audit market (Simon *et al.*, 1986; Ghosh, 2007; Ghosh, 2011).
5. The average USD/INR exchange rate during our sample period is around INR 42 per USD, though the rate has fluctuated widely during the period.
6. In India, most of the companies have financial year beginning on 1st April and ending on 31st March.
7. The results of robustness check have not been reported for the purpose of brevity and can be made available upon request.

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Appendix

Variable acronym	Unit	Definition
Dependent variable (audit fee pricing model)		
af	INR mm	Audit fee, in INR millions
log_af	Log (#)	Natural logarithm of audit fee, in INR millions
Dependent variable (auditor choice model)		
big4	Dummy	1 = Auditor is affiliated to PwC, KPMG, E&Y or Deloitte; 0 = Otherwise
Variables of interest (hypothesis variables)		
big4	Dummy	1 = Auditor is affiliated to PwC, KPMG, E&Y or Deloitte; 0 = Otherwise
special	Dummy	1 = Auditor is an industry specialist (Rank 1 or 2 in the industry-year, as per audit fee-based market share); 0 = Otherwise
naf	INR mm	Non-audit fee, in INR millions
naf_dum	Log (#)	Natural logarithm of non-audit fee, in INR millions
fin_dist	Dummy	1 = Financial distress (Altman z_score < 1.81) in the audit year, 0 = Otherwise
bsize	#	Number of directors on Board of Governors
log_bsize	Log (#)	Natural logarithm of board size
bind	%	Board independence, measured as number of independent board members divided by board size
ceod	Dummy	1 = Company CEO is also Chairman of Board; 0 = Otherwise
Control variables – firm level characteristics		
age	Years	Age of firm since incorporation, in years
log_age	Log (#)	Natural logarithm of (1 + Age), in years
bg	Dummy	1 = Business Group affiliated; 0 = Otherwise
bigfrm	Dummy	1 = Total assets of firm is greater than industry-year median; 0 = Otherwise
cata	%	Current assets, divided by total assets
fgn	Dummy	1 = Foreign Promoter, 0 = Otherwise
fii	%	Foreign institutional investors' ownership in firm
gfc	Dummy	1 = Audit year overlaps with period of Global Financial Crisis (between 2007 and 2010), 0 = Otherwise
insider	%	Promoters' ownership in firm
lev	%	Debt to total assets ratio
listing	Dummy	1 = Firm has gone public in the immediately preceding, current or immediately following audit year, 0 = Otherwise
loss	Dummy	1 = Net income is negative in current financial year; 0 = Otherwise
nsales	INR mm	Net sales, in INR millions
nsalesgr	%	Growth in net sales
psu	Dummy	1 = Government Owned, O = Otherwise
roa	%	Return on assets, measured as net income divided by total assets
seg	#	Number of business segments
log_seg	Log (#)	Natural logarithm of (1 + number of business segments)
ta	INR mm	Total assets, in INR millions
log_ta	Log (#)	Natural logarithm of total assets, in INR millions
tobinq	#	Tobin's Q (book value of total debt plus market value of equity, divided by book value of assets)

Table AI. Definitions of variables

(*continued*)

Variable acronym	Unit	Definition
Control variables – auditor level characteristics		
initiate	Dummy	1 = Auditor has initiated relationship with a firm in current audit year; 0 = Otherwise
tenure	Log (Yrs)	Natural logarithm of tenure of firm–auditor relationship, in years
Control variables – industry-year fixed effects variables		
fyear	Date	Financial year ending of the firm
nic2d	#	Two-digit National Industrial Classification (NIC) code
year	Date	Calendar year of firm's financial year ending

Table AI.

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