Audit Quality and Seasoned Equity Offerings Methods □

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SUMMARY

Using a sample of U.S. seasoned equity offering (SEO) during the period 2002-2017, we document that audit quality is associated with SEO issuance method choice. Specifically, firms with higher quality auditors are more likely to adopt the accelerated offerings issue method instead of using other seasoned equity offering methods. We also identify that audit tenure and industry audit specialization influence the relation between audit quality and the likelihood of undertaking accelerated SEO offerings, and that the relationship is more pronounced in the presence of weaker firm-level information and governance environments. Extending from the conclusion that accelerated offerings serve as a quality certification mechanism, we also find that firms completing accelerated offerings enjoy lower audit fees in subsequent years. These firms also exhibit superior post-SEO-issue long-term abnormal stock performance. Overall, our study shows that the certifying and monitoring role of auditors is valuable to clients, underwriters, and investors in SEO transactions.

KEYWORDS: Seasoned equity offerings; audit quality; audit pricing; Propensity score matching.

JEL CLASSIFICATION: G13, G32, M42

1. INTRODUCTION

It has long been theoretically recognized that the asymmetry of information between firms and outside investors can determine firms' financing choices because higher information asymmetry results in higher external financing costs (Myers, 1984; and Myers and Majluf, 1984).[1] In the literature on seasoned equity offerings (SEOs) where firms raise additional capital from the equity market, the certification hypothesis (Beatty and Ritter, 1986; Booth and Smith, 1986; Carter and Manaster, 1990) proposes that asymmetric information between issuing firms and investors implies that any quality certification mechanism that helps investors verify SEO issuing firms should be especially valuable. Because firms' financial statements play an important role in reducing information asymmetry in capital markets and auditors provide the key accredited service assuring the integrity of this information, we expect that the quality of audit services serves as an important governance and certification mechanism in SEOs. In this study, we examine the role of firm auditor quality in determining the choice of SEO issue methods. We also examine the relation between SEO methods and post-SEO outcomes - in terms of audit fees and long-term stock performance.

The current heterogeneity in the type of method by which SEOs are accomplished allows us to examine whether auditor quality may be important for determining how firms undertake SEOs. Specifically, the underwriting of SEOs in the U.S. can be categorized into three major types by their offer methods: fully marketed offers, accelerated offers, and rights offers. While fully marketed SEOs and rights issues can take several months to complete, accelerated SEO offerings allow firms to raise equity capital in one or two days through

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[1] The pecking order theory of Myers (1984) and Myers and Majluf (1984) predicts that firms with higher information asymmetry have higher external financing costs and therefore tend to choose debt financing over equity financing. Existing empirical research has also highlighted the role of information asymmetry in influencing how firms adopt equity financing choices (for instance, Eckbo and Masulis, 1992; Bortolotti et al., 2008; Chang et al., 2009; Autore et al., 2011).

either bought deals or accelerated bookbuilt deals.[2] In an accelerated SEO offering, the issuer foregoes investment banks' marketing efforts in return for a lower fee and lower underpricing. For underwriters to accept an accelerated SEO offering, due to the short completion time-frame and limited time to conduct due diligence, underwriters often look for certification indicators or assurances from the issuer that would indicate expected issue 'success'.[3] For example, Koerniadi et al. (2015) show that firm-level corporate governance quality is one potential valuable certification mechanism for SEOs, while Gao and Ritter (2010) find that the elasticity of stock demand is a major discriminator between firms conducting accelerated and non-accelerated offerings.[4]

Chang et al. (2009) develop a theoretical model based on the idea that the quality of auditors can effectively reduce information asymmetry regarding future earnings of firms. These authors also argue that the audit process plays an important role in assuring the integrity of financial statements, thereby reducing information asymmetry between informed managers and uninformed suppliers of capital. In the context of SEOs, based on the theoretical prediction in Chang et al. (2009), we propose that auditor quality represents an 'external' certification and governance mechanism that is relevant for underwriters when making decisions on involvement in accelerated SEOs. Specifically, firms use the engagement of quality auditors as a certification mechanism. Our choice of audit quality arises because audit quality plays a key role in assuring the integrity of financial information,

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[2] During the last decade, accelerated SEOs have become a lot more popular (Bortolotti et al., 2008). Accelerated SEOs allow issuers to raise significantly more funds per offering, have lower underwriting spreads, and also require fewer underwriting banks involved.

[3] The ability to move quickly to offer shares in an accelerated offer has significant value to the issuer because it allows the firm to take advantage of favourable market conditions. However, because investors have less time to perform due diligence, a sudden SEO offering also accentuates potential 'lemons' concerns. Another major difference between a fully marketed offer and an accelerated offer is the extent of underwriters' marketing of the issue to achieve a higher offer price and post-issue stock price. While the issuing firm needs to balance the gain from a higher stock price with the extra expenses associated with greater marketing efforts, underwriters need other forms of assurance of success in the event there are less marketing activities.

[4] More generally, Mande et al. (2012) and Dutordoir et al. (2014) find that corporate governance quality is related to whether firms issue various forms of debt or equity. Autore et al. (2008) identify that firms conduct shelf registrations following certification based on previously completed shelf registration issues and issues involving lower pre-issue stock price run-up.

and thus reduces the information asymmetry between informed managers and uninformed suppliers of capital (Chang, Dasgupta, and Hilary, 2009). We argue that high audit quality reduces the information asymmetry between informed managers and underwriters; accordingly, underwriters may not demand higher investigation costs, lower underwriting risk and hence, firms with high audit quality are more likely to choose accelerated offerings. Extant research shows that Big N auditors are associated with higher audit quality than non-Big N auditors (for a detailed review, see DeFond and Zhang (2014) and DeFond, Erkens, and Zhang (2015)). Prior research shows that Big N auditors play a significant role in financing decisions (see, for example, Willenborg (1999) and Copley and Douthett (2002) for reducing the cost of equity in IPOs, Mansi et al. (2004) for reducing the cost of debt, Pittman and Fortin (2004) for reducing debt-monitoring costs, Chang et al. (2009) for equity versus debt financing). However, the literature is silent on the role of Big N auditors in the design features of seasoned equity offerings. As the accelerated offering method is a predominant form of seasoned equity offerings (SEOs) around the US market, we extend this strand of research by examining the role of audit quality in determining accelerated offerings.

Our empirical results are based on a sample of 3,280 SEOs from U.S. firms over the period 2002-2017. Following Chang et al. (2009) and Eshleman and Guo (2014), we measure auditor quality in terms of auditor reputation (Big 4 or non-Big 4 audit firm status), and also based on auditor industry specialization in additional testing. These proxies for audit quality are easily identifiable as a form of firm certification by underwriters, and particularly investors, around the time of SEO decision-making. Most importantly, prior research has reported consistent evidence of higher financial information quality among firms audited by Big 4 auditors (Teoh and Wong 1993; Krishnan, 2003; Francis and Wang, 2008). In addition, we also employ accruals quality as a measure of financial information quality in modelling the choice of SEO methods.

[4]

Our empirical results are straightforward. We document that SEO issuers audited by Big 4 auditors are more likely to undertake SEOs using the accelerated offering method and less likely to use non-accelerated offerings.[5] We also emply a robust econometric approach to address endogeneity concerns and find that these primary results continue to be observed. These findings suggest that audit quality is a valid certification mechanism used by firms and underwriters in determining SEO offer methods. We further identify that accelerated offerings themselves represent a certification mechanism for auditors. We find that post-accelerated offerings, firms pay lower audit fees. These firms also exhibit significantly higher long-term abnormal stock performance than firms employing other SEO issuing methods.

This study offers three important contributions to the literature. First, we document that audit quality serves as an important certification for firms in raising equity capital via SEOs.[6] Prior studies have suggested that audit quality plays an important role in costly financing decisions. For example, Titman and Trueman (1986) demonstrate that a firm with more favorable private information about its value chooses a higher quality auditor and investment banker than a firm with less favorable private information. Mansi et al. (2004) show that firm employing Big N auditors enjoy a lower cost of debt. Khurana and Raman (2004) show that a Big N audit is associated with a lower ex ante cost of equity capital in the US. Chang et al. (2009) argue that auditor quality is quite critical to the success of corporate financing decisions as auditors play an important assurance role regarding the integrity of financial statements and show that companies audited by Big 6 firms (compared to those audited by small audit firms) are more likely to issue equity as opposed to debt. Moreover, Chang et al.

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[5] We use a Big 4 versus non-Big 4 auditor classification primarily because Big 4 audit firms are clearly of higher status. While empirical findings could differ depending on auditor classification, the literature on audit quality and earnings management (Teoh and Wong, 1993; Becker et al., 1998; Reynolds and Francis, 2001; Asthana et al., 2009; Rutledge et al., 2014) generally agrees that Big 8 to Big 4 auditor status relates to higher audit quality.
[6] While prior literature has documented the roles of audit quality in capital markets via the cost of equity capital (Khurana and Raman, 2004), the cost of debt financing (Pitman and Fortin, 2004; Blackwell et al., 1998), the valuation of IPOs (Balvers et al., 1988; Beatty, 1989; and Hogan, 1997), and the choice of equity over debt in capital structures (Chang et al., 2009), there is, however, little research on the relation between audit quality and SEOs.

(2009) suggest that while the theoretical literature has suggested that Big N auditors serve available function, there is a paucity of empirical evidence on the importance of auditor quality to companies' financing decisions. Accordingly, we extend the audit quality literature, represented by the signature work of Titman and Trueman (1986) and Chang et al. (2009), to examine the role of audit quality in the context of SEO issuance choice decisions. More specifically, we focus on the association between audit quality features in the design of SEO o□erings. A related study by Rauterkus and Song (2005) identified that the reputation of service providers was important to clients in the setting where capital markets exhibited more negative reaction to SEOs of firms audited by Arthur Anderson. While it is intuitively plausible that investors should be especially concerned with reputational losses of service providers when valuing firms due to signalling, it is not immediately clear if this reputation matters to underwriters who are also service providers in SEOs.[7] We show that audit quality is important in aiding firms to raise equity capital more quickly and also at lower costs via the use of accelerated SEOs, consistent with the notion that audit quality mitigates information asymmetry between firms and other service providers such as underwriters.[8] As SEO o□erings are widely used internationally, the evidence in this paper contributes to further understanding of the importance of audit quality on firm financing decisions.

Second, we contribute to a growing literature in corporate finance that examines accelerated offers as a preferred method in SEO offerings. Bortolotti et al. (2008) document a world-wide shift towards accelerated underwriting in SEOs. They also show that U.S. accelerated SEO deals exhibit significantly lower spreads, less underpricing, lower negative

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[7] For example, one could argue that the information asymmetry is lower between underwriters and firms than between outside investors and firms. As such, audit quality can play a lesser role in the choice of how firms raise capital in SEOs.

[8] Our study also contributes to a body of audit literature that investigates if audit fees signal audit quality (Bell et al., 2001; Hope and Langli, 2010; Blankley et al., 2012; and Ball et al., 2012). Because lower audit fees could result from less required audit work due a superior firm-level information environment, fewer agency problems, less information asymmetry and a lower likelihood of earnings management, lower audit fees could also indicate a certification mechanism relating to audit and wider firm quality, independent of underlying auditor reputation. The positive relation between audit fees and the likelihood of firms using accelerated offerings documented in our study helps resolve this controversy.

announcement period excess returns, and total issuance costs that are significantly lower than those for fully marketed SEOs. Gao et al. (2010) show that both the pre-SEO-issue elasticity of the issuing firm's demand curve and the offer size are important determinants of the offer method choice in SEOs. They further argue that firms should substitute accelerated offers for rights offers when the benefits of fully marketed SEO offerings are low.[9] Our study highlights that audit quality is a significant determinant in the adoption of the accelerating offering method over traditional methods. This evidence also adds to a rising stream of SEO literature on the process in which issuing firms and underwriters are paired in a manner consistent with two-sided matching (Fernando et al., 2005; Schroth, 2006; and Lyandres et al., 2016).[10]

Finally, our study addresses whether successful undertaking of accelerated SEOs itself represents a certification mechanism that also influences other related economic outcomes for issuing firms in the period after SEOs. Autore et al. (2008) document a revival of shelf-registered offerings where firms can conduct 'off-the-shelf' offerings with little or no advanced notice to the market. In doing so, prior success of accelerated SEOs serves as a partial certification mechanism for issuing firms on top of (substituting for) underwriter due diligence. Because the use of accelerated offerings is a signal of wider firm quality, and particularly lower agency costs and information asymmetry, we also document auspicious economic outcomes such as lower future audit fees being levied and superior post-SEO stock performance for firms using accelerated offering relative to firms using other SEO issue methods.

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[9] For example, Bortolotti et al. (2008) show that larger firms face lower information asymmetry problems than smaller firms and are more likely to use an to raise equity capital. This explains the demise of rights offers where the drop in the market share of rights offers as documented in Eckbo et al. (2007) has occurred at roughly the same time as the increase in the market share of accelerated SEO offerings (Bortolotti et al., 2008).

[10] The market for underwriting service has long been modelled as a one-sided selection process where either the firm chooses the underwriter (Titman and Trueman, 1986; Habib and Ljungqvist, 2001) or the underwiter chooses the firm (Chemmanur and Fulghieri, 1994).

The rest of the paper is organized as follows. Section 2 presents a wider literature discussion and the development of our research hypotheses. Section 3 describes our data sources, variable construction procedures and the approach to our empirical analysis. Section 4 presents the various empirical results and interpretation, and we conclude the paper in Section 5.

2. HYPOTHESIS DEVELOPMENT

There has been strong consensus in the literature that auditor quality is essential in ensuring high reliability of financial information. In a theoretical framework, Titman and Trueman (1986) develop a signaling model and demonstrate that an entrepreneur with more favorable private information about his/her firm's value tends to choose a high-quality auditor relative to a manager with less favorable private information. Several empirical studies support the prediction from this theory. For example, Ball et al. (2012) show that managerial use of high-quality audited financial statements is an effective mechanism to provide support for the financial integrity of the firm. Mansi et al. (2004) argue that an outside auditor may contribute significant benefits to investors when potential conflicts of interest among owners, managers, and other shareholders exist. These authors suggest that firms employing Big N or industry-specialist auditors have lower costs of debt due to better monitoring.[11] Similarly, Khurana and Raman (2004) confirm that a high-quality auditor is associated with a lower ex-ante cost of equity capital for firms.

The role of audit quality is particularly important for capital financing activities. For example, Chang et al. (2009) assert that companies audited by large audit firms (compared to

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[11] Pittman and Fortin (2004) examine the impact of auditor choice on debt pricing in the early public years of a firm's life, and find that, by employing a large auditor, a firm can reduce debt-monitoring costs through enhancing the credibility of financial statements. However, Fortin and Pittman (2007) examine the role of auditor choice for the price of public bonds issued to qualified institutional buyers under U.S. Securities and Exchange Commission (SEC) Rule 144A, and find no significant difference in the bond yield spread or credit rating between Big 4 firms and those audited by non-Big 4 firms.

those audited by small audit firms) are more likely to issue equity as opposed to debt, enjoy greater financial flexibility, and depend less on favourable market conditions for equity issuance decisions. The authors attribute these qualities to the effect of higher certification from large audit firms to the capital market. Because firms often manage earnings around the time of equity issues, including around IPOs (Ball and Shivakumar, 2008; Cecchini et al., 2012; Armstrong et al., 2016) and SEOs (Rangan, 1998; Teoh et al., 1998; Shivakumar, 2000), engagement of high-quality auditors is effective in curbing earnings management around corporate equity issues (Zhou and Elder, 2004).[12]

When firms raise equity in SEOs, the accelerated offering method has become a popular SEO offering technique in the U.S. (Gao and Ritter, 2010) where an issuer foregoes investment banks' marketing efforts in return for a lower fee. Due to the speed of issuance and lower transaction costs, accelerated offerings often increase competition among investment banks and place additional pressures on due diligence investigations. However, the time constraint imposed by the accelerated method places an upper limit on the extent of due diligence evaluation that can be accomplished by investment bankers.[13] Because of this, information asymmetry plays a critical role in the choice of the accelerated SEO offering method. For example, Bortolotti et al. (2008) document that larger and more valuable firms are more likely to choose an accelerated offering process due to lower information asymmetry.[14] Relatedly, Koerniadi et al. (2015) find that stronger internal corporate governance structure is associated with the likelihood firms use the accelerated offer method.

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[12] Outside the U.S., Alhadab and Clacher (2018) show that audit quality is negatively related to both accrual and real earnings management during U.K. IPOs. More generally, Chi et al. (2011) show that higher audit quality is associated with a substitution from accrual to real earnings management practices by firms.

[13] In order to win the deal in a timely manner, the underwriter must quickly assess the market demand before committing to an offer price. Bortolotti et al. (2008) show that there is less information gathering and lower marketing effort for accelerated offerings.

[14] Melia et al. (2018) examine the choice between rights issues and private placements in Australia and find that time-variation in information asymmetry can explain the cyclicality in SEO issuance methods.

Jensen and Meckling (1976) argue that credible financial reporting reduces the information asymmetry between corporate managers and stockholders, improves investor confidence, raises the stock price and thereby makes it less costly for corporations to raise new equity capital and to grow. The quality of audit depends on the ability to establish an external mechanism to mitigate information asymmetry, e.g. by increasing the monitoring of management, curbing managers' opportunistic behaviour, or improving the quality of firms' information flows. However, the quality of service varies substantially among the auditors because Big 6 firms are widely known as suppliers of better quality services. Skinner and Srinivasan (2012) find that the market rewards companies that employ higher quality auditors and that auditor reputation matters. Knechel, Krishnan, Pevzner, Shefchik and Velury (2013) argue that society will deem a high-quality audit to be one that avoids (major) economic problems for a company and/or the market. According to Willenborg (1999), larger and more prestigious firms have stronger incentives to avoid providing a comparatively low-quality audit at a high-quality price.

Titman and Trueman (1986) develop a model and demonstrate how the quality of the chosen auditor can rationally be used by investors in valuing new issues. Becker, Defond, Jiambalvo and Subramanyam (1998) argue that auditing reduces information asymmetries that exist between managers and firm stakeholders by allowing outsiders to verify the validity of financial statements. Mansi, Maxwell and Miller (2004) argue that the potential conflicts of interests among owners, managers, and other security holders create an environment in which an outside auditor may contribute significant value to investors and show that firms employing Big N or industry-specialist auditors enjoy a lower cost of debt. Pittman and Fortin (2004) examine the impact of auditor choice on debt pricing in firms' early public years and show that retaining a Big Six auditor, a firm can reduce debt-monitoring costs by enhancing the credibility of financial statements. Khurana and Raman (2004) show that a Big

4 audit is associated with a lower *ex ante* cost of equity capital for auditees in the US but not in Australia, Canada, or the UK. Moreover, Chang, Dasgupta and Hilary (2009) argue that auditor quality is quite critical to the success of corporate financing decisions as auditors play an important assurance role regarding the integrity of financial statements and in reducing information asymmetry. They show that companies audited by Big 6 firms compared to those audited by small audit firms are more likely to issue equity as opposed to debt. We argue that firms can use high quality audit services, to mitigate the information asymmetry between managers of issuing firms and their potential investors.

Despite a significant amount of literature discussing the importance of auditor quality in alleviating asymmetric information between firms and external parties, the importance of auditor quality in determining the choice of SEO method has largely lain dormant. In addition, because it is generally understood that firms undertaking SEOs are prone to upward earnings management, the integrity of financial information is especially important to external parties in SEOs. In this context, auditors with perceived higher quality offer an important quality certification of financial information to both investment bankers and investors. We, therefore, propose that underwriters and investors require less due diligence investigation for firms with high-quality audit services and these firms are more likely to use accelerated offerings in raising seasoned equity capital. We propose the first hypothesis in the alternative form as follows:

H1: *Firms with higher audit quality are more likely to use accelerated offerings than other SEO issue methods.*

Prior studies (Simunic, 1980; Whisenant et al., 2003; and Francis, 2011) suggest that the audit fee is a function of auditor effort, the economic bonding with the client and perceived audit risk. Auditors demand higher fees for those firms with higher informational asymmetries/agency related conflicts (DeFond and Zhang, 2014) as they need to input more

effort into ensuring that the financial statements do indeed reflect the underlying economic situation of the firm. Jha and Chen (2015) conjecture that auditors will determine their effort, and hence fee levels, via an assessment of the managerial integrity within the firm that will depend, in part, upon the degree of informational asymmetry in that firm and subsequent agency-related costs. Essentially, then, the audit fee will be a positive function of the level of information asymmetry that is inherent within a firm. Previous studies also link information asymmetry to audit fee determinants (see for example, audit effort (Niemi, 2005), number of subsidiaries (Huson and MacKinnon, 2003), auditors' risk (Abbott, Parker, and Peters, 2006), auditor prestige (Niemi, 2005) and auditor-client relationship (Solomon, Shields, and Whittington, 1999; Geiger and Raghunandan, 2002).

We argue that an accelerated offering decision signals enhanced information efficiency, stimulates information production, and reduces information asymmetries between insiders and outsiders and that these effects increase with the propensity of accelerated offering decisions. Therefore, auditors have to input reduced effort immediately after an accelerated offering decision and, as a consequence, we would expect that auditors demand lower fees after the announcements of accelerated offering decisions. The external audit provides a monitoring service which, in part, addresses agency conflicts. The accelerated offering decision helps in mitigating information asymmetries and thereby agency conflicts, which will in turn reduce audit risk. Therefore, auditors are expected to exert less effort in conducting audits for firms which have completed accelerated offerings. As a result, managers of such firms making accelerated offering decisions will be able to negotiate for lower audit fees via this demand side argument.

We further argue, from a supply side perspective, that an accelerated offering decision may affect audit fees through its impact on the litigation risk faced by the auditors. Litigation risk and reputational concerns are strong motivations for auditors to become fully engaged in

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their auditing roles (DeAngelo, 1981), along with the professional rules and regulatory requirements that discipline auditors' actions (Caramanis and Lennox, 2008). Auditors use their client information to assess their business risk exposure - reputational damage and litigation risk and, in turn, set their audit price / negotiate their fee to protect themselves (Stanley, 2011). We argue that due to the role of the accelerated offering decision in reducing information asymmetries and agency conflicts and stimulating information production, audit firms will likely reduce any risk premium built into audit fees for clients successfully completing accelerated SEO offerings decisions. Increased negotiating power on the part of managers and lower required audit effort and risk on the part of firm auditors will result in lower audit fees, leading to the following hypothesis that underpins our empirical analyses:

H2: *Firms completing accelerated offerings have lower post-SEO audit fees compared to firms using other SEO issue methods.*

Prior studies have also been interested in the long-run under-performance over the period immediately after SEO offerings (see, for example, Hansen and Crutchley, 1990; Loughran and Ritter, 1995 and 1997; Rangan, 1998; Teoh et al., 1998; Eckbo et al., 2000). This post-SEO long-term performance provides market-based judgement of the enduring quality of the SEO firms.[15] According to the theoretical framework in Myers and Majluf (1984) and Miller and Rock (1985), information asymmetry between insiders (managers) and outsiders, as well

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[15] The long-run underperformance of SEOs has received wide attention in academic research. For instance, Eckbo et al. (2000) explain that lower post-SEO stock returns are caused by lower systematic risk exposure for offering firms relative to comparable non-offering firms. Burch et al. (2004) provide evidence on long-term performance which supports the argument that overvalued firms are less likely to choose rights offerings. Teoh et al. (1998) and Rangan (1998) show that manipulation of earnings before SEOs partially explains post-announcement earnings under-performance and stock return under-performance. Dechow et al. (2009) find that firms that misstate their financial statements are actively seeking additional financing from capital markets. They suggest that such firms are attempting to inflate their stock prices in order to raise capital on more favourable terms, and indicate that these misstatements appear to be made with the objective of covering up a slowdown in financial performance in order to maintain high stock market valuations. Daniel et al. (1998) present a model where investors are characterized by overconfidence as they overweight private information and underweight public information in their investment decisions and these cognitive biases lead to particular post-event price adjustments.

as prospects of future earnings reduction, can provide an explanation for value-destroying corporate decisions following SEOs.

Fields and Mais (1994), Jung et al. (1996), McLaughlin et al. (1996), and Teoh et al. (1998) take a different view and argue that agency issues are the strongest factor driving managers to make equity-issue decisions over debt. Teoh et al. (1998) suggest that the long-run under-performance over the period following SEO offerings is the result of managerial manipulation to inflate earnings before SEO offerings. Previous studies have also investigated the role of corporate governance in equity issue decisions and on post-SEO performance and concluded that good (bad) corporate governance structures are positively related with positive (negative) stock price and operating performance (see, for example, Ching et al., 2002; Leuz et al., 2003; Gompers et al., 2003).

A number of studies document that firms' stock returns deteriorate following firm commitment offerings (Spiess and Affleck-Graves, 1995; Loughran and Ritter, 1995, 2000; and Jegadeesh, 2000) and private placements (Hertzel et al., 2002). Ritter (2003) shows that SEO firms underperform various benchmarks by about 3.5% per year in the 5 years subsequent to issuance. Loughran and Ritter (1995) argue that managers can create value for existing shareholders by timing financing decisions to exploit mispricing caused by market inefficiencies and this is supported in the CFO survey by Graham and Harvey (2001). That is, for example, overconfident investors will tend to overreact to their private signals or analyses thereby inducing mispricing in the pre-event period. Hertzel and Zhi (2010) find that firms with greater growth opportunities invest more in capital and undertake R&D expenditure after issuance, but do not experience lower post-issue stock returns; whereas, issuing firms with greater mispricing tend to decrease long-term debt and/or increase cash holdings, and do earn lower returns. They argue that their findings are consistent with behavioral explanations for post-issue stock price underperformance.

If accelerated offerings act as a certification mechanism for firm stakeholders (including underwriters, auditors and investors), we would expect more favourable economic outcomes, both around and after issue announcements, for firms undertaking accelerated offerings compared to firms using other issue methods.[16] Due to the lower information asymmetries in the case of accelerated offerings, the likelihood of overvalued issues being feasible is reduced relative to non-accelerated offerings, where the information asymmetry is higher. As a consequence, the continuing price correction in the post-announcement period after the underreaction to the public announcement will be lower for accelerated offerings. Furthermore, since the post-announcement price reactions will be related to the mispricing of the stock prior to the issuance, the magnitude of these reactions will be positively related to the extent of mispricing in the period prior to issuance and negatively related to the price reaction in the announcement period. In the latter case, the correction of the prior mispricing has been partially corrected via the underreaction to the public signal. Accordingly, we predict the following hypothesis:

H3: *Firms completing accelerated offerings experience higher long-run abnormal return performance compared to firms using other SEO issue methods.*

3. RESEARCH DESIGN

3.1 Data and sample

We employ a comprehensive sample of seasoned equity offerings over the 2002- 2017 period conducted by U.S. publicly listed companies. We use the SDC Platinum database to identify U.S. public companies raising seasoned equity via accelerated offerings, rights offerings, private placement, and firm commitment offerings. Initially, we obtain a raw sample of 21,278 seasoned equity offerings. We then exclude 9,017 offerings because they do

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[16] Regarding SEO issue methods, Ngatuni et al. (2007) find that the choice of SEO method has a significant impact on the long-run post-offering performance of U.K. companies. They show that firms that make rights issues subsequently perform better than firms that use other SEO methods.

not have any shelf offering status in the SDC database. We further delete events with incomplete offerings, duplicate issuance, units, preference shares, warrants, trust units, American depositary shares, and convertible bonds. We also remove equity offerings that do not have total assets and market value information at the balance sheet date immediately prior to the announcement. The final sample consists of 3,280 distinct events. Panel A of Table 1 provides details of exclusions used in deriving the final sample.

[Insert Table 1 here]

For stock data, we retrieve the following information from the CRSP database: daily returns, market returns, daily bid-ask price for the period from one year prior to the announcement date through to the one-year period after the announcement date, and market capitalization at one month prior to the announcement date. We collect annual accounting data from Compustat and identify Big 4 audit firm status at the balance sheet date immediately prior to the issue announcement using data from Audit Analytics. We also collect audit fees for the year immediately following the announcement year from Audit Analytics. We employ the Thomson Reuters Institutional (13F) Holdings database to obtain institutional ownership data for each firm issuer at the last quarter immediately prior to the announcement. We then calculate the level of institutional ownership as the ratio of institutional investor shares held to total shares outstanding. Finally, we also collect data on financial analyst coverage and subsidiaries from Institutional Brokers' Estimate System (I/B/E/S) and Osiris, respectively.

Panel B of Table 1 provides a summary of the composition of our sample. Specifically, Panel B1 (B2) shows the year-by-year- (industry-) wise distribution for accelerated offerings and non-accelerated offerings. The number of seasoned equity offerings per year steadily increases from 2002 to 2017. During the global financial crisis (GFC) the number of accelerated offerings declines to just 9 offerings in 2008. However, the number of accelerated

offerings increases from 2009 onwards. Seasoned equity offerings are predominantly from firms operating in the retail industry, while firms from the manufacturing industry are the next most strongly represented. The distribution across accelerated and non-accelerated offerings are generally consistent across the industry classifications, although there is a higher proportion of accelerated offerings from firms operating in the retail industry. Overall, accelerated offerings by U.S. firms comprise approximately 20% of all SEOs during the sample period. This is similar to the 16% proportion reported by Bortolotti et al. (2008) in their earlier cross-country study.

3.2 Firm characteristics

Table 2 reports descriptive statistics of firm-level financial characteristics stratified by different types of SEOs (e.g., accelerated offerings and non-accelerated offerings).[17] *FSIZE* is the total assets at the balance sheet date immediately prior to the offer announcement date. *MV* is the market value of the issuing firm one month prior to the announcement date. *ASSGRT* is the change in the log of total assets. *LEVRG* is the ratio of total debt to total assets. *BM* is the book-to-market ratio measured as the ratio of the book value of assets to market value of assets. *TANGIBILITY* is the net PPE-to-assets ratio. *SDVOL* is the standard deviation of monthly returns calculated for each firm each year. *SDEAR*, is the standard deviation of the *EBITDA* to total assets ratio over a 10-year period. *LIQUID* is the average proportionate bid-ask spread for the one-year period prior to the announcement. *lnSP* is the median monthly closing price over the 12-month period prior to SEO announcement. *IDYRISK* is the standard error from a market model estimation for the 1-year period before the announcement date (daily returns from day t-260 to day t-2). *AGE* is the number of years since first being included in the Compustat database. *INSOWN* is the proportion of shares held by institutional investors. *OP* is offering proceeds. *OPTOTA* is offer proceeds relative to

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[17] The table also reports non-parametric test statistics for the differences in median values between the two sub-groups.

total assets. *ANALYST* is the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period. *BIG4* is a dummy variable which takes a value of 1 for firms audited by Big 4 audit firms, and zero otherwise. Finally, *ACCRUAL* is the total accrual at the balance sheet date immediately prior to the announcement.

Several notable features are observed from the comparison across the two sub-groups. In Table 2, firms with higher profitability, larger size, higher leverage, lower risk, higher liquidity, greater analyst following, the appointment of Big 4 auditors, and higher institutional ownership tend to choose accelerated offerings. Firms with lower market capitalization, lower leverage, higher risk, lower liquidity, lower institutional ownership, which are audited by non-Big 4 auditors are more likely to raise external capital by other equity offerings, such as private placements and rights offerings. These differences suggest that those firms subject to greater governance oversight and monitoring appear more likely to choose accelerated offerings. This is possibly because these firms have lower agency problems and lower levels of information asymmetry. Firms offering accelerated SEOs also exhibit higher audit quality (based on auditor status) relative to firms using other equity issuance methods.

[Insert Table 2 here]

Following the current literature (Chang et al., 2009; Lennox et al., 2012), we address the selection bias arising from the choice of auditor by employing a probit regression to estimate the determinants of the auditor selection model, in association with the well-known two-stage Heckman correction process. We report our results on the determinants of the likelihood of choosing high-quality audit firms in Appendix B2. Further, prior studies indicate that audit fees are also expected to be an endogenous variable in the subsequent analysis (Sandra and Patrick, 1996). To mitigate this possible endogeneity problem, we estimate a first-stage audit fees prediction model. However, rather than using the predicted value as in the Big 4 auditor

estimation process above, we employ the residual (unexpected) value from the estimated regression as this is envisaged to best represent a large auditor fee premium and/or excess audit effort component that will be correlated with audit quality. We report the empirical results of this analysis in Appendices B2 and B3.

4. EMPIRICAL RESULTS

4.1 Big 4 auditor and SEO decisions

Prior research (Teoh and Wong, 1993; Krishnan, 2003; Francis and Wang, 2008) suggests that the earnings of companies with Big 4 auditors are of higher quality and that the stock market values earnings surprises of Big 4 clients more highly than those of firms with non-Big 4 auditors. There are two likely explanations. First, Big 4 clients exhibit smaller abnormal accruals, consistent with the notion that Big 4 auditors constrain aggressive earnings management (Becker et al., 1998; Francis, Maydew, and Sparks, 1999; Krishnan, 2003). Second, because Big 4 auditors are more likely to issue going-concern warnings than non-Big 4 auditors for the same set of client circumstances (Francis and Krishnan, 1999, 2002), investors have greater confidence in the reported earnings of Big 4 clients. In our study, we therefore employ Big 4 auditors as a primary proxy for auditor quality.

Motivated by hypothesis *H1*, this section examines whether audit quality determines the choice of different SEO issuance methods (accelerated offerings versus non-accelerated offerings) using a logistic regression model. The dependent variable, $SEOCHOICE_{i,t}$ indicates the SEO issuance selection of firm *i* in year *t*, taking the value of 1 for accelerated offerings, and 0 for non-accelerated offerings (including firm commitment offerings, private placements, and rights offerings).

The analysis then compares firms that undertake accelerated offerings relative to firms employing other seasoned equity offerings. Accordingly, the proposed explanation of the

[19]

binary response *Y* (*SEOCHOICE)* by the key independent variable (*ActBIG4*) and a set of control variables (*CONTROLS*) is specified in the model as follows:

$$Log\left(\frac{Y}{1-Y}\right) = \beta_0 + \beta_1 ActBIG4_{i,t-1} + \gamma CONTROLS_{i,t-1} \tag{1}$$

where,

We employ Actual Big 4 Auditors (*ActBIG4*) status as a proxy for audit quality. *ActBIG4* is a dummy variable, taking the value of one if an actual Big 4 audit firm is employed, and zero otherwise. All control variables are measured over or at the end of the previous year, and winsorized at the 1% level. Following Chang et al. (2009) and Lawrence et al., (2011), we include firm size (*FSIZE*), liquidity (*LIQUID*), risk (*IDYRISK*), to control for firm size, the effect of stock liquidity, and idiosyncratic risk, respectively. In addition, following Gao and Ritter (2010) and Koerniadi et al. (2015), we control for the effect of relative issue size (*OPTOTA*), firm age (*lnAGE*), book-to-market ratio (*lnBM*), and leverage (*LEVRG*). We also follow Autore et al. (2011) and include several variables that are likely correlated with both SEO choice and audit quality, including the proportion of shares held by institutional investors (*INSOWN*), total accrual at the balance sheet date immediately prior to the announcement (*lnACCRUAL*), and the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period (*lnANALYST*). Further, industry- and year-fixed effects are included, and all models are estimated with robust standard errors to correct for heteroscedasticity and are clustered at the firm level (Petersen, 2009).

Table 3 presents the empirical analysis results for the relation between high-quality auditor status (*ActBIG4*) and the probability of undertaking an accelerating SEO offering.

[Insert Table 3 here]

Column (1) shows that coefficient estimate on *ActBIG4* is positive and statistically significant at the 1% level in all specifications. These results support the prediction from

hypothesis *H1* and indicate that firms audited by high quality (Big 4) audit firms are more likely to undertake accelerated offerings.

The results for the other firm-level variables generally exhibit the anticipated signs and are in line with the current literature (Chang et al., 2009). For instance, firms with higher leverage (*LEVRG*), greater institutional ownership, and firms with a shelf registration facility (*DSHELF*) are more likely to use accelerated offerings than other offering methods. The coefficient estimate on *IDYRISK*, a proxy for firm risk, is negative and statistically significant in Model 1 in Table 3, indicating that firms with lower risk are more likely to choose accelerated offerings over other offering methods.

Next, we re-estimate a similar model using the expected Big 4 auditor indicator variable (*ExpBIG4*) as a proxy for audit quality.[18] *ExpBIG4* is the expected value of *BIG4* estimated in the first stage Big 4 auditor prediction regression model as reported in Appendix B2. *BIG4* is a dummy variable which takes the value of one if the firm engages one of the Big 4 audit firms as its auditor for the year immediately prior to the issue announcement date, and zero otherwise. As discussed in Appendix B2, this study employs the Big 4 auditor variable that is lagged one year and firm-specific variables that are lagged two years in the first stage regression model. We also bootstrap this system 500 times to obtain the 95% confidence intervals in the second stage estimation. In this analysis, *ExpBIG4* is a dummy variable, taking the value of one for predicted Big 4 auditor employment, and zero otherwise. We present the results in Column (2) of Table 3. The results show that the coefficient estimate on the *ExpBIG4* variable is positive and statistically significant, consistent with firms predicted to be audited by high-quality auditors immediately prior to the announcement being more likely to choose usage of accelerated offerings over non-accelerated offerings. These findings

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[18] For details regarding the estimation of *ExpBIG4*, see Appendix B2.

suggests that firms with high-quality auditors are more willing to undertake (or capable of undertaking) accelerated offerings because they signal higher firm and issue quality.

4.2 Endogeneity

In this section, we conduct robustness checks to assess whether our results in the previous section are reliable.

4.2.1 Firm-fixed effects

Although we control in the regressions for many firm-level characteristics that are potentially correlated with audit quality and SEO issue decision, we are aware that the results can be driven by unobservable and time-invariant heterogeneity across firms. We address this concern by performing a regression that includes firm-fixed effects.

Columns (1) and (2) of Table 4 presents the logistic regression results of these analyses using the actual Big 4 auditor and expected Big 4 auditor variables, respectively, as proxies for audit quality. As shown, audit quality is significantly and positively associated with accelerated offerings even after controlling for firm-fixed effects. Specifically, the coefficient estimates of the *ActBIG4* and *ExpBIG4* variables are 0.981 (*t*-stat=2.99) and 0.756 (*t*-stat=2.75), respectively. These results suggest that our results are not driven by time-invariant unobservable firm characteristics.

[Insert Table 4 here]

4.2.2 Propensity score matching approach

Lee, Poon, and Sinnakkannu (2017) provide evidence that firms' blockholders can choose their preferred issuers themselves and, frequently, these decisions are not randomly determined. This can result in self-selection problems and make standard regression estimation misleading (Tucker, 2010). In order to address such a selection bias problem, we follow the existing literature and implement a propensity score matching process.[19] The

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[19] For details, see Rosenbaum and Rubin (1983), Heckman et al. (1997), Li and Zhao (2006), Bertrand and Zitouna (2008). According to Bertrand and Zitouna (2008), the propensity scores are the probability of receiving

propensity score is the conditional probability of treatment designation with ex ante variables, for instance, the conditional probability of a seasoned equity offering choice given firm-level characteristics, such as firm size and operating performance.

Table 5 presents the results on the effect of audit quality on the choice of accelerated offerings vs. non-accelerated offerings using the propensity score matching sample. In Panel A, we report comparison of the mean differences in the covariates of *treatment firms* (accelerated offerings) with those of *control firms* (non-accelerated offerings) for the sample before matching (Columns (1) and (2)), and for the sample after matching (Columns (3) and (4)). After estimating the propensity scores, we construct a matched sample of firms, where a match is selected for each of the treated firms from the pool of control firms. Panel A shows that the distribution of characteristics is comparable between accelerated offerings and non-accelerated offerings firms. Indeed, *t*-tests confirm that the null hypothesis of indifferent mean values between the treatment and control groups cannot be rejected for all the variables, except for the audit quality (*ActBIG4*) indicator.

[Insert Table 5 here]

Panel B of Table 5 reports the probit regression results for the propensity matched sample. The dependent variable is a dummy variable taking a value of one for accelerated offerings, and zero for non-accelerated offerings. All control variables are measured over or at the end of the previous year, and winsorized at the 1% level. After controlling for firm and issue characteristics and addressing selection bias, our findings support our hypothesis that firms with higher audit quality are more likely to use accelerated offerings than other SEO issue methods.

4.3 Robustness checks

4.3.1 Alternative variable approach

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a treatment based on the observable characteristics of treatment and control groups. In addition, the propensity score matching approach can control the endogeneity and ex-ante observable characteristics (Dehejia and Wahba, 2002), and combines each company's pre-treatment characteristics into a single indicator variable.

In this section, we employ a number of additional tests relating to alternative variable specification to verify our results.[20] First, we focus on earnings management as a proxy for audit quality. The pioneering studies of Rangan (1998) and Teoh et al. (1998) raise concerns about whether firms manage their earnings around SEO events, and the effects of earnings management on accounting performance and stock markets.[21] DuCharme et al. (2004), Cohen and Zarowin (2010), and Zang (2012) also find evidence that firms manipulate accounting information around seasoned equity offerings. For instance, Cohen and Zarowin (2010) find that firms undertake both real and accrual-based earnings management strategies around the timing of additional equity offerings.

Existing audit quality literature suggests that there is a correlation between audit quality and earnings management (Becker et al., 1998; Francis et al., 1999; Balsam et al., 2003; Krishnan, 2003; Dunn and Mayhew, 2004). These authors find that earnings management decreases if firms are audited by independent auditors or Big 4 audit firms. Comprix and Huang (2015) indicate that firms with small auditors exhibit increased earnings manipulation. Since the purpose of an auditor is to improve financial reporting quality, we utilize accruals quality (*ACCRUALS*) as an observable proxy for audit quality. *ACCRUALS* is estimated as the moving sum of the absolute value of discretionary accruals over the three-year period from t-1 to t-3, where discretionary accruals are calculated based on the modified Jones model (Dechow et al., 1995). We report the regression results in Column (1) of Table 6.

Consistent with previous results, we find that coefficient estimate on *ACCRUALS* is negative and significant at the conventional 1% level, controlling for firm size (*FSIZE*),

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[20] In unreported analyses, we elect to also investigate audit fees as a certification signal because fees can represent both auditor status and audit efforts. It is commonly suggested that larger audit firms charge premium fees for their reputation (Craswell et al., 1995; Asthana et al., 2009). Studies including Hope and Langli (2010), Blankley et al. (2012) and Ball et al. (2012) relate audit fees with higher audit efforts and higher quality of audit execution.

[21] These empirical findings indicate that seasoned equity offerings are significantly related with both poor stock returns and weak operating performance, leading academics to question that earnings can be manipulated in the event of equity offerings. Also see Shivakumar (2000) for more details.

idiosyncratic risk (*IDYRISK*), relative issue size (*OPTOTA*), shelf offering (*DSHELF*), and stock liquidity (*LIQUID*). These results confirm the main finding in our study that firms of higher audit quality (represented by lower discretionary accruals) are more likely to use accelerated offerings than other SEO issue methods.

[Insert Table 6 here]

Second, our main results might be driven by auditor size. While the current literature provides evidence that Big 4 auditors provide higher audit quality compared to non-Big 4 auditors (e.g., Becker et al., 1998; Francis and Krishnan, 1999; Francis et al., 1999), a number of other studies have documented mixed evidence when they use mid-tier auditors to proxy for audit quality.[22] Therefore, it is possible that our results in the previous sections might differ across audit firms with different size. To alleviate this concern, we employ a mid-tier auditors indicator as a proxy for audit quality. Following Cassell et al. (2013), we consider Grant Thornton, BDO Seidman, McGladrey & Pullen, and Richard A. Eisner as mid-tier auditors. We report the results for this robustness test in Model (2) of Table 6. Mid-tier auditors or national auditors (*NAAUD*) are employed as a proxy for audit quality. *NAAUD* is a dummy variable which equals one for firms audited by Grant Thornton, BDO Seidman, and McGladrey & Pullen, and Richard A. Eisner audit firms, and zero for other audit firms, in year *t-1*. We also re-run the Model (2) analysis dropping clients of Big 4 auditors from the sample and find similar results. The dependent variable, *SEOCHOICE$_{i,t}$* takes a value of one for accelerated offerings and zero for other offering methods (firm commitment, private placements, and rights offerings. The results reported in Column (2) of Table 6 demonstrate that our findings remain qualitatively unchanged, although somewhat statistically weaker,

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[22] For example, Boone et al. (2010) and Cassell et al. (2013) report no significant difference in audit quality between Big 4 and medium-sized audit firms; whereas, Eshleman and Guo (2014) suggest that Big 4 auditors provide higher quality of auditing compared to middle-class auditors. Lawrence et al. (2011) point out that the difference in audit quality between Big 4 and non-Big 4 auditors is most likely due to customer characteristics, especially firm size.

and SEO issuance decisions are similarly associated with audit quality proxied by Big 4 or mid-tier auditors.

4.3.2 The effects of audit firms' characteristics, firm-level information environment, and governance structure

Auditors' characteristics and their impact on audit quality and audit pricing is a central research question (Francis, 2011). In this section, we investigate the effects of audit firms' characteristics, and firm-level information environment and governance structure on the relation between audit quality and SEO offering method choice.

We first focus on examining the impact of auditor tenure and auditor industry specialization on the SEO issuance choice decision. Previous studies have related audit tenure to earnings quality and audit quality and suggested that long-tenured auditors can provide higher quality auditing services because of better customer-specific knowledge.[23] Given that auditors with longer tenure possess client specific knowledge necessary to conduct a high-quality audit, the effect of audit quality on the SEO issuance choice decision, and particularly the likelihood of undertaking accelerated offerings, should be more pronounced among firms with longer auditor tenure. Similarly, the current literature also shows that shorter tenure is associated with more audit reporting failures (Geiger and Raghunandan, 2002) and higher litigation risk (Stice, 1991). Building from these findings, if tenure itself is relevant to audit quality outcomes, it is expected that the positive relation between Big 4 auditor status and the likelihood of undertaking an accelerating SEO offering will be augmented by the length of associated audit tenure. In other words, a positive interaction effect is envisaged between the Big 4 auditor indicator and the length of audit tenure. The alternative is that audit tenure may

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[23] Johnson et al. (2002) find that firms with higher earnings management tend to engage with short-tenure auditors (2-3 years) rather than with median-tenure auditors (4-8 years). Similarly, Geiger and Raghunandan (2002), Myers et al. (2003), Ghosh and Moon (2005), and Gul et al. (2007) find that auditors with longer tenure are related to higher quality of earnings, indicating a higher quality of auditing (Chen et al., 2016). The majority of evidence also suggests that short-tenure auditors are related with lower audit quality due to a lack of client-specific knowledge (Myers et al., 2003; Gul et al. 2009; Chen et al., 2016).

be a substitute audit quality signal and may increase the likelihood of firms undertaking accelerated offerings independent of whether the auditor has Big 4 status or otherwise.

We employ two dummy variables, one for *STENURE* which is defined as newer auditors whose tenure is three years or less, and longer-tenure auditors, *LTENURE*, as those with at least four years of tenure (Johnson et al., 2002; Carcello and Nagy, 2004; Gul et al., 2009; Chen et al., 2016). We then allow for an interaction between the auditor tenure variables and the BIG4 auditor dummy.

The results in Panel A of Table 7 show that the interaction term between Big 4 auditor and *STENURE* (*ActBIG4*STENURE*), and the interaction term between Big4 auditor and *LTENURE* (*ActBIG4*LTENURE*) is positive and significant. The magnitude of the coefficient estimates for *ActBIG4*STENURE* is larger than those for *ActBIG4*LTENURE*. These findings support the view that the effect of Big 4 auditor on the SEO issue decisions is more pronounced for newer (short-tenured) auditors.

[Insert Table 7 here]

In addition to the dichotomy between large and small audit firms, existing auditing literature also places substantial emphasis on the variation in industry expertise. The potential importance of specialized auditors is associated with current findings that the expertise of the industry specialist auditors is related with higher audit quality and greater auditor performance.[24] Prior research also shows that firms employing industry specialist auditors are associated with higher earnings quality (Balsam et al., 2003; Krishnan, 2003). Srinidhi et al. (2014) find that strongly-governed family firms are more likely to choose specialist auditors

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[24] Solomon et al., (1999) find that specialized auditors create more accurate and effective audits. Low (2004) also finds that industry specialization advances the audit firms' quality of risk evaluation and audit planning decisions. Dunn and Mayhew (2004) provide evidence that clients select auditors as part of their overall disclosure strategy. Accordingly, in addition to higher quality audits, industry-specialist audit firms assist clients in enhancing disclosures. The choice of an industry-specialist auditor signals a client's intention to provide enhanced disclosures. They find a positive association between industry-specialist audit firms and analysts' rankings of disclosure quality in unregulated industries, but no relation in regulated industries. Krishnan (2005) finds that specialists have been proven to be more resilient, more confident and less influenced by managers in evaluating the validity of accounting methods and assessments entrenched in financial reports. Knechel et al. (2007), Lim and Tan (2008), Gul et al. (2009) document similar results.

and exhibit higher earnings quality than non-family firms. Given that firms with industry specialist auditors have better information environments with higher earnings quality than non-specialist auditors, we argue that industry audit specialisation should add an additional layer of quality certification and strengthen the underlying relation between Big 4 auditor status and the likelihood of undertaking an accelerated offering. The alternative is that, in the presence of audit industry specialisation, recognition of audit quality based on Big 4 status is less important in providing the degree of quality certification to facilitate successful execution of accelerated SEO offerings. To proxy for auditor industry specialization, we follow Srinidhi et al. (2014) and use two dummy variables. *SPECIALIST* takes the value of one for the market leader in audit work in the SIC two-digit industry by client sales, and zero otherwise. *Non-SPECIALIST*, takes the value of one for other than market leaders in audit work in the SIC two-digit industry by client sales, and zero otherwise.

We examine the impact of Big 4 auditor status with the *SPECIALIST* and *NON-SPECIALIST* categories on the SEO method choice indicator and present the results in Panel B of Table 7. We find a significantly positive relation between Big 4 auditors and the probability of undertaking accelerated SEO offerings for both interaction terms (the interaction between both *SPECIALIST* and *Non-SPECIALIST* and *ActBIG4*). However, we find that the estimated coefficient for *ActBIG4*Non-SPECIALIST* is statistically significantly much greater than that for *ActBIG4*SPECIALIST*. Overall, our findings show that the impact of Big 4 auditors on the likelihood of undertaking accelerated offerings is stronger for firms with non-specialist auditors.

Next, we examine whether the firm-level information and governance environment significantly affects the relation between audit quality and SEO offerings.[25] Demiralp et al.

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[25] The pioneering studies by Myers (1984) and Myers and Majluf (1984) suggest that firms with greater information asymmetry tend to have higher external financing costs and therefore, these firms are more likely to prefer debt issuance decision before share issuances following a financing pecking order. There is a rich body of current literature that has highlighted the important role of the information environment in reducing information

(2011) examine the effect of information asymmetry, characterized by institutional ownership, on stock price and operating performance following seasoned equity offerings. The authors identify a monitoring effect played by institutional investors in reducing information asymmetry and improving post-issue stock returns and operating performance following seasoned equity offerings.[26]

The presence of greater firm-level information asymmetry for investors and other stakeholders such as underwriters is expected to reduce the underlying likelihood of firms being able to execute accelerated offerings. Similar to the above analysis, we propose that the employment of a Big 4 auditor should enhance information quality and provide a certification signal potentially offsetting other information asymmetry concerns and increasing the likelihood of firms being able to complete SEOs using the accelerated offer method. To conduct this investigation, we employ analyst coverage (Panel A1 of Table 8) and institutional ownership (Panel A2 of Table 8) as proxies for the corporate information environment.[27,28] For each fiscal year in the sample period, we sort firms into two groups (high and low information asymmetry) based on the median value of each information asymmetry measure. We interact our audit quality variable with the high and low information asymmetry dummies and regress these two interaction variables on the accelerated offering

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asymmetry. For instance, Kothari et al. (2009), Tetlock (2010) and Peress (2014) employ media news as a proxy for the firm's information transparency and find that media news reduces the firm's information asymmetry, agency costs, and the cost of capital. Chahine et al. (2015) find that informative news diminishes the asymmetric information between SEO issuing firms and outside investors and, hence, reduces earnings management prior to the equity offerings. At country-level, Fauver et al. (2017) investigate the effect of the enactment of the securities regulation across 18 European countries on SEO offerings and find that the enactment of regulations results in enhanced firm-level information transparency and a reduction in information asymmetry around SEO offerings.

[26] See Heron and Lie (2004), Cronqvist and Nilsson (2005), Gao and Ritter (2010), Pandes (2010), Autore, Hutton, and Kovacs (2011), for more results on the effect of information asymmetry on the equity issuance method choice.

[27] Existing evidence suggests that firms that are covered by more financial analysts report more reliable and high-quality information; thus, there is less information asymmetry (e.g., Lang and Lundholm, 1996; Hope, 2003; Yu, 2008).

[28] Given block institutional investors' greater ownership stakes, institutional blockholders have incentives and are able to monitor and discipline firm management. Following previous studies (e.g., Li et al., 2006; Ng et al., 2016), institutional blockholders are defined as institutional investors who hold at least 5% of a firm's outstanding shares. Analogously, the block institutional ownership is measured at the end of the previous year.

decision indicator variable. We find that the coefficient estimates for the interaction variables incorporating both low and high information asymmetry environment proxies (are positive and statistically significant, however, the coefficients for the interaction variables reflecting greater levels of information asymmetry (*lowANALYST* and *lowINSOWN*) are higher and more strongly significant. This is, consistent with audit quality based on Big 4 audit firm status providing a stronger quality and certification signal for accelerated offer method choice in weaker underlying firm information environments.

[Insert Table 8 here]

We further examine the firm corporate governance environment as a channel or moderating influence on the relation between audit quality and SEO issue method decisions.[29] To proxy for firm-level corporate governance, we use board independence (*BIND*) and dedicated institutional ownership (*IODED*) in sample firms. For each fiscal year in the sample period, we sort firms into two groups (high and low corporate governance) based on the median value of each governance measure. The *BIND* variable refers to the percentage of independent directors on the board in year *t-1*, while the *IODED* is the percentage of dedicated institutional ownership in year *t-1*. We calculate the yearly percentages of shares outstanding held by dedicated institutional investors, taking the average over the four quarters of the firm's financial year *t-1* using data from the Thomson Reuters Institutional Holdings (13F) database.

Our classification of dedicated institutional investors is based on Bushee (1998). We interact our audit quality variable with the high and low governance structure dummies and regress these two interaction variables on the accelerated offering decision indicator variable.

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[29] Extant research on SEOs links issuance method choice with agency problems (Teoh et al., 1998; Leuz et al., 2003) and the role of corporate governance structures in reducing earnings management following SEO decisions (Gompers et al., 2003). Chemmanur and Paeglis (2005) find that reputable managers can convey the intrinsic value of their firm more reliably to outsiders and, hence, mitigate information asymmetry. Chemmanur et al. (2010) find that SEO issuers' performance is positively correlated with managerial quality.

In Panel B of Table 8, only the coefficient estimates on the interaction terms incorporating the weak corporate governance environment (*lowBIND* and *lowIODED* interaction variables) are consistently positive and statistically significant, suggesting that the use of a Big 4 auditor provides an incrementally stronger certification and quality signal in the presence of weaker corporate governance structures.

Overall, we find that the association between audit quality and the likelihood of undertaking an accelerated offering SEO is stronger in the case of inferior firm-level information and governance environments suggesting that audit quality can offset other firm-level agency and governance attributes expected to adversely influence underwriter preferences regarding SEO offers.[30]

4.4 The impact of SEO issuance choice on post-announcement audit fees

Autore et al. (2008) suggest that two effective non-underwriter certification mechanisms used by firms to support shelf offerings are the successful completion of prior shelf offerings and the undertaking of prior offerings following smaller stock price runups which signals that overvalued equity is not being issued.

We consider whether the undertaking of accelerated SEOs provides a similar certification signal regarding the firm information environment, information asymmetry levels and firm quality. If a successful accelerated offering process signals underwriter and market recognition of the firm's management, accounting and reporting processes and stock price valuation, the firm's external auditors may place a (or a greater) degree of reliance on this external certification. If so, the auditor may be able to exert relatively less future effort in

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[30] As a further robustness check we also use audit fees as another proxy for audit quality (based on higher audit fees representing greater audit effort and potentially an audit firm reputation premium, thus higher perceived overall audit quality) and examine the relation of audit fees with the SEO offering method choice indicator variable using the logit model specification. We report the estimated logistic model results in Appendix B4 as well as the two-stage estimation process to obtain the unexpected component of audit fees (*ResidualAUDFEE*) used to proxy for audit quality in part of this analysis. We find that coefficient estimates on the *ActAUDFEE* and *ResidualAUDFEE* variables are positive and statistically significant at the 1% level. These findings indicate that firms with higher auditor quality based on the audit fee proxies have a greater likelihood of executing accelerated offerings.

their auditing work. The resulting outcome would be lower future audit fees, independent of the underlying quality of the auditor. Thus, our prediction is that firms completing accelerated offerings will be associated with lower subsequent levels of audit fees.

The dependent variable in the models estimated in Model (1) of Table 9 is the logarithm value of audit fees at the balance sheet date immediately after the announcement year. The key independent variable is the SEO offer method choice represented by *SEOCHOICE*, which is a dummy variable taking the value of one if the offering method used is an accelerated offering and zero otherwise. Following the current literature, we apply the equivalent explanatory variables adopted in existing studies examining the determinants of audit fees (Collier and Gregory, 1996; Seetharaman et al., 2002; Jha and Chen, 2015). Control variables include firm size (*FSIZE*) which is represented by the logarithm of total assets for the models in Model 1, and the logarithm of the market value of the issuing firm one month prior to the offer announcement (*lnMV*) is employed to proxy for firm size in Model 2. *DSHELF* is a dummy variable for shelf offerings, taking the value of one if the offering is a shelf offering and zero otherwise; *BIG4* is a dummy variable which equals one if a firm employs a Big 4 auditor, and zero otherwise; *BUSY* is a dummy variable which takes the value of one if a firm's financial year ends between December 1st and March 31st; *SUBLOCAL* is the number of local subsidiaries; *SUBFOREIGN* is the number of foreign subsidiaries; *lnANALYST* is the logarithm of the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period; *LOSS* is a dummy variable which takes the value of one for a firm making a loss during the previous year, and zero otherwise; *ROTA* is earnings before interest and tax divided by total assets; *SEGMENT* is the number of business segments obtained from Compustat segment data; *LEVRG* is the ratio of total debt to total assets; *OPINION* is a dummy variable which takes the value of one if the audit firm gives a qualified opinion at the balance sheet date immediately prior to the announcement and zero otherwise;

lnACCRUAL is the total accrual at the balance sheet date immediately prior to the announcement; and *INSOWN* is the proportion of shares held by institutional investors.

In Model (1) of Table 9, consistent with the hypothesis **H2** statement, we find that the coefficient estimate on *SEOCHOICE* is negative and statistically significant, indicating that audit firms charge relatively lower audit fees for firms completing accelerated offerings in the immediate post-SOE period. This is consistent with the successful completion of accelerated offerings providing a certification signal for firm auditors regarding firm quality and facilitating reduced future audit work.

We also find that the coefficient estimate on *BIG4* is positive and statistically significant in our regression model. This is consistent with the notion that larger, more esteemed audit firms execute high-quality audits and charge a higher audit price (Willenborg, 1999).

[Insert Table 9 here]

As a robustness check, we use the ratio of post-announcement audit fees to total assets as an alternative dependent variable and report the regression results in Column (2) of Table 9. Similar to Model (1), we find that firms completing accelerated offerings are subject to lower subsequent scaled audit fees in comparison to firms employing other equity issuance methods

4.5 Long-term stock returns

In this section, we examine long-term stock price reactions subsequent to accelerated offerings and firm commitment offerings (as the other prominent SEO issue method type) using a calendar-time methodology (see, for example, Loughran and Ritter, 2000; Peyer and Vermaelen, 2008; Hertzel and Zhi, 2010) and the monthly cumulative average abnormal returns (*CAR*) using Ibbotson's (1975) returns across time and security (*IRATS*) method.[31] The purpose of this analysis is to assess the certification effects of firms completing

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[31] Peyer and Vermaelen (2008) suggest that the IRATS methodology can address changes in the riskiness of the equity in the long-term price reaction.

accelerated offerings from the perspective of the capital market response to SEO method choice.

We compute monthly returns in calendar-time for portfolios of accelerated offering and firm commitment offering firms. Firms are added to the portfolios at the beginning of the month after the announcement month of SEOs and retained for a maximum of the next 36 months or until the stock no longer trades (to measure 36-month long-term performance). At the beginning of each month, the portfolio is rebalanced so that each stock receives equal weight. Over time, new SEO firms come into the portfolios and old firms leave, causing the number of stocks in the portfolios to vary.

We, then, employ the three-factor model (Fama and French, 1993); the four-factor model (Fama and French, 1993) combined with the momentum factor of Carhart (1997); the five-factor model (three factors of Fama and French (1993), momentum factor of Carhart (1997), liquidity factor of Pastor and Stambaugh, (2003)); and the seven-factor model (five factors of Fama and French (2015), momentum factor of Carhart (1997), and liquidity factor of Pastor and Stambaugh (2003)) to calculate the average monthly abnormal long-term performance of the SEO offering type portfolios.

We perform a single time-series regression with the excess return of the equally-weighted portfolio return as the dependent variable and the return on the three factors, four factors, five factors and seven factors, respectively, as the independent variables. We employ both ordinary and weighted least squares (OLS and WLS) regressions to calculate the monthly abnormal portfolio performance. The square root of the number of firms in each month determines each month's weight.

In Panel A of Table 10, the average monthly abnormal long-term performance α_p is insignificant for the 36-month period subsequent to the announcement of firm commitment offerings, under either OLS or WLS regressions. However, we find consistent evidence

across the various models of positive post-announcement abnormal returns for portfolios of firms employing accelerated offerings.

[Insert Table 10 here]

As a robustness check, we use the *IRATS* method in all factor models. In Panel B, we document significantly positive long-term abnormal returns for various post-announcement windows (12 months, 24 months and 36 months) for portfolios of firms employing accelerated offerings. These results from Panels A and B in Table 10 support hypothesis *H3* that firms employing accelerated offerings exhibit superior (and also positive) long-run return performance relative to firms using other SEO issue methods. We further document negative long-term abnormal returns for the 36-month period for firms completing firm commitment offerings using the three-, four-, and five-factor models. These findings are consistent with the completion of accelerated offerings providing a positive certification to the market about firm quality. This is in stark contrast with (or offsets) the typical overvalued signal associated with seasoned equity offerings.

Overall, we document positive post-announcement period abnormal returns for firms conducting SEOs using accelerated offerings.

5. CONCLUSION

Despite the prominence of auditor quality in certifying financial information in the capital market (Hogan, 1997; Blackwell et al., 1998; Pitman and Fortin, 2004), the relation between auditor quality and the choice of SEO issue method has not been thoroughly examined in the prior literature. Our study provides new insights into the role of auditor status as a certification mechanism in SEOs and the impact of issuance choice of SEOs on audit pricing and long-run performance.

We document evidence that auditor quality, based on Big 4 auditor status, has a significant association with the design features of SEO offerings. Specifically, firms with high quality auditors are more likely to use the accelerated offering SEO method rather than the traditional firm commitment offer process and other issue methods. We confirm this finding using audit fees, accrual levels and mid-tier audit firms as alternative proxies for audit quality and also find that the role of audit quality in facilitating accelerated offering use is more prominent in cases of shorter audit tenure, the appointment of non-specialist auditors and in the presence of weaker firm-level information and corporate governance environments.

We also provide support for a certification role for accelerated offerings in the post-SOE period. We document that firms completing accelerated offerings pay lower subsequent audit fees relative to firms using firm commitment and other offering methods. These firms also exhibit higher long-term post-issue abnormal share price performance. This is in stark contrast with the negative signalling implications of equity capital raisings generally documented in the SEO literature.

The findings in this study offer several interesting implications for future research. For example, Bortolotti et al. (2008) document a worldwide increase in the market share of SEO issue activity using accelerated offers. Researchers can investigate if auditor quality can serve as a certification mechanism that explains the increasing popularity of accelerated offers in international markets, especially in those markets where auditor status is most important in certifying the quality of issuing firms.[32]

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[32] Choi et al. (2018) document that high-quality auditors discipline firms from poor reporting practice and Francis and Wang (2008) report high-quality auditors ensure better earnings quality in international markets. These studies suggest that stronger investor protection regimes per se do not appear to affect the properties of accounting earnings without also considering the quality of enforcement by high quality auditors. Auditors of high quality are, therefore, more likely to be an important certifying mechanism for firms in markets of poorer information quality (Choi et al., 2008).

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Table 1: Summary of sample selection and data filtering

Panel A: Sample Derivation

Reason for Sample Exclusion	No. of offerings
Initial Sample of US SEO with shelf offering details	21,278
Less Exclusions	
- Without shelf offering details	9,017
- IPO offering	2,419
- Duplication offering	2,175
- American Depositary Share (ADS)	2
- Warrants	182
- Convertible bonds	685
- Preference shares	52
- Trust units	520
- Units	680
- Without Firm codes/announcement details	220
- Without Total assets and Market value	870
- Without Return Series Data for one year	642
- Without Offering Proceeds Data in SDC	534
Total Exclusions	17,998
Final Sample	3,280

Panel B: Summary of sample selection and distribution

This table provides year-wise classification and industry representations of SEO offerings of the final sample including accelerated offerings, firm commitment, private placement and rights offerings made during the period 2002-2017.

	Panel B1: Year-wise classification		
Year	**Accelerated offerings**	**Non-accelerated offerings**	**Total**
2002	15	123	138
2003	26	163	189
2004	41	194	235
2005	43	150	193
2006	25	112	137
2007	32	157	189
2008	9	149	158
2009	11	160	171
2010	13	364	377
2011	13	216	229
2012	37	179	216
2013	51	194	245
2014	29	130	159
2015	86	124	210
2016	99	115	214
2017	122	98	220
Total	652	2,628	3,280
	Panel B2: Industry-wise classification		
Industry	**Accelerated offerings**	**Non-accelerated offerings**	**Total**
Agriculture	29	202	231
Transport	35	438	473
construct	80	320	400
Finance	6	82	88
Manufacturing	192	721	913
Mining	3	93	96
Retail	259	734	993
Services	11	9	20
Transport	26	6	32
Wholesale	11	23	34
Total	652	2,628	3,280

Table 2: Seasoned equity offerings and sample firm characteristics

This table reports summary statistics of firm-level financial characteristics according to different types of SEOs (accelerated offerings and non-accelerated offerings). The table also reports non-parametric test statistics for the differences in median values between the two sub-groups. These firm-level financial variables include: *FSIZE*, the total assets at the balance sheet date immediately prior to the announcement date; *MV*, the market value of the issuing firm one month prior to the announcement; *ASSGRT*, the change in the log of total assets; *LEVRG*, the ratio of total debt to total assets; *BM*, the book-to-market ratio measured as the ratio of the book value of assets to market value of assets; *TANGIBILITY*, the net PPE-to-assets ratio; *SDVOL*, standard deviation of monthly return calculated for each firm each year; *SDEAR*, standard deviation of the EBITDA to asset ratio over a 10-year period; *LIQUID*, average proportionate bid-ask spread for one year period prior to the announcement; *lnSP*, median monthly closing price over a 12-month period; *IDYRISK*, the standard error for the 1-year period before the announcement date (return from day t-260 today t-2); *AGE*, the number of years since the firm entered the Compustat database; *INSOWN*, the proportion of shares held by institutional investors; *DSHELF*, shelf offering; *OPTOTA*, offer proceeds relative to total assets; *ANALYST*, the maximum number of analysts making annual earnings forecasts any month over the last 12-month period; *BIG4*, a dummy variable which takes a value of 1 for firms audited by Big 4 audit firms, and zero otherwise; *ACCRUAL*, total accrual at the balance sheet date immediately prior to the announcement; CMINDEX is the underwriter's reputation using the Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Characteristics		ACC	Non-ACC	MW Test
FSIZE ($m)	Mean	8,477.56	13,610.16	
	Median	2,114.03	816.84	9.63***
MV ($m)	Mean	3,621.52	2,461.86	
	Median	996.35	438.85	6.96***
ASSGRT (%)	Mean	21.63	14.38	
	Median	14.65	5.94	1.68*
LEVRG (%)	Mean	46.35	29.02	
	Median	36.85	20.83	7.68***
BM	Mean	0.70	0.67	
	Median	0.71	0.63	2.63***
TANGIBILITY	Mean	31.63	22.09	
	Median	15.63	11.20	0.83
SDVOL	Mean	0.02	0.03	
	Median	0.02	0.03	9.74***
SDEAR	Mean	-0.02	-0.06	
	Median	-0.05	0.03	2.05**
LIQUID	Mean	0.68	1.61	
	Median	0.33	0.67	7.98***
lnSP	Mean	26.15	17.64	
	Median	17.63	11.90	4.68***
IDYRISK	Mean	0.02	0.03	
	Median	0.01	0.02	11.57***
AGE	Mean	15.91	11.43	
	Median	10.36	8.56	2.36**
INSOWN (%)	Mean	44.25	30.29	
	Median	33.12	23.36	1.84*
DSHELF	Mean	0.91	0.57	
	Median	1.00	0.00	6.59***
OPTOTA (%)	Mean	23.97	36.03	
	Median	9.86	16.74	5.52***
ANALYST	Mean	8.63	6.37	
	Median	6.00	4.84	26.35***
BIG4	Mean	0.94	0.76	
	Median	1.00	0.96	5.63***
ACCRUAL	Mean	0.08	0.10	
	Median	0.04	0.05	2.91***
CMINDEX	Mean	0.04	0.02	
	Median	0.00	0.00	2.12**

Table 3: The role of audit quality (Big 4) on the SEO issuance choice decision

This table presents the logistic regression results of the relation between audit quality and SEO issuance decisions. The dependent variable, $SEOCHOICE_{i,t}$, is a dummy variable taking a value of one for accelerated offerings, and zero for non-accelerated offerings. In Model (1) we employ actual Big 4 auditors to proxy for audit quality; while for Model (2), expected Big 4 auditors is employed to proxy for audit quality. This study further employs a number of other firm-level control variables ($CONTROLS_{i,t-1}$) that could potentially influence firm choice of SEO types. All control variables are measured over or at the end of the previous year, and winsorized at the 1% level, including firm size ($FSIZE$), liquidity ($LIQUID$), risk ($IDYRISK$), relative issue size ($OPTOTA$), shelf offering ($DSHELF$), logarithm of firm age ($lnAGE$), logarithm of book-to-market ratio ($lnBM$), leverage ($LEVRG$), the proportion of shares held by institutional investors ($INSOWN$), logarithm of total accrual at the balance sheet date immediately prior to the announcement ($lnACCRUAL$), and logarithm of the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period ($lnANALYST$). CMINDEX is the underwriter's reputation using the Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. The construction of the related variables is detailed in Appendix A. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Variables	Audit quality and SEO methods		
	(1)		**(2)**
ActBIG4	**0.662**	*ExpBIG4*	**0.713**
	(4.01)*		**(4.99)***
FSIZE	0.094	*FSIZE*	0.118
	(2.03)**		(2.84)***
LEVRG	0.492	*LEVRG*	0.614
	(2.15)**		(2.61)**
INSOWN	0.168	*INSOWN*	0.185
	(2.51)**		(2.91)***
lnBM	0.110	*lnBM*	0.137
	(1.15)		(1.41)
lnAGE	0.064	*lnAGE*	0.081
	(0.99)		(1.16)
LIQUID	-0.103	*LIQUID*	-0.128
	(-2.91)***		(-3.26)***
OPTOTA	0.033	*OPTOTA*	0.043
	(2.36)**		(3.37)***
IDYRISK	-8.681	*IDYRISK*	-9.281
	(-2.41)**		(-2.98)***
DSHELF	1.024	*DSHELF*	1.228
	(4.75)***		(5.78)***
lnACCRUAL	0.026	*lnACCRUAL*	0.032
	(0.35)		(0.48)
lnANALYST	0.827	*lnANALYST*	1.009
	(2.91)***		(2.96)***
CMINDEX	0.0024	*CMINDEX*	0.0027
	(3.78)***		(4.23)***
Constant	-3.724	*Constant*	-4.538
	(-5.43)***		(-6.62)***
Fixed Effects	YI	*Fixed Effects*	YI
Pseudo R²	0.249	*Pseudo R²*	0.265
Obs	3,280	*Obs*	3,280

Table 4: Firm-fixed effects

This table presents the logistic regression results of the relation between audit quality and SEO issuance decisions, controlling for firm and year fixed effects. The dependent variable, *SEOCHOICE*$_{i,t}$, is a dummy variable taking a value of one for accelerated offerings and zero for non-accelerated offerings. This study further employs a number of other firm-level control variables (*CONTROLS*$_{i,t-1}$) that could potentially influence firm choice of SEO types. All control variables are measured over or at the end of the previous year, and winsorized at 1%, including firm size (*FSIZE*), liquidity (*LIQUID*), risk (*IDYRISK*), relative issue size (*OPTOTA*), shelf offering (*DSHELF*), logarithm of firm age (*lnAGE*), logarithm of book-to-market ratio (*lnBM*), and leverage (*LEVRG*), the proportion of shares held by institutional investors (*INSOWN*), logarithm of total accrual at the balance sheet date immediately prior to the announcement (*lnACCRUAL*), and logarithm of the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period (*lnANALYST*). CMINDEX is the underwriter's reputation using the Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. The construction of the related variables is detailed in Appendix A. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Variables	Audit quality and SEO methods		
	(1)		**(2)**
ActBIG4	0.985	*ExpBIG4*	0.758
	(3.00)***		(2.75)***
FSIZE	0.085	*FSIZE*	1.014
	(4.91)***		(5.82)***
LEVRG	0.651	*LEVRG*	0.814
	(3.38)***		(4.40)***
INSOWN	0.543	*INSOWN*	0.557
	(3.31)***		(3.35)***
lnBM	0.154	*lnBM*	0.146
	(0.82)		(0.51)
lnAGE	0.088	*lnAGE*	0.083
	(1.12)		(0.60)
LIQUID	-0.191	*LIQUID*	-0.229
	(-2.95)***		(-3.13)***
OPTOTA	0.0553	*OPTOTA*	0.081
	(2.57)**		(2.77)***
IDYRISK	-7.772	*IDYRISK*	-7.924
	(-5.27)***		(-5.85)***
DSHELF	0.957	*DSHELF*	1.086
	(9.11)***		(10.28)***
lnACCRUAL	0.074	*lnACCRUAL*	0.080
	(1.09)		(1.24)
lnANALYST	0.733	*lnANALYST*	0.637
	(4.27)***		(3.85)***
CMINDEX	0.0026	*CMINDEX*	0.0032
	(2.74)***		(2.98)***
Constant	-7.123	*Constant*	-7.110
	(-6.77)***		(-5.37)***
Fixed Effects	FY	*Fixed Effects*	FY
Pseudo R²	0.392	*Pseudo R²*	0.405
Obs	3,280	*Obs*	3,280

Table 5: Propensity score matching results for Accelerated offerings versus Non-accelerated offerings

This table presents the results for the effect of audit quality on the choice of accelerated offerings vs. non-accelerated offerings using the propensity score matching sample. Panel A compares the mean differences in the covariates of treatment firms (accelerated offerings) with those of control firms (non-accelerated offerings) for the sample before matching (Columns (1) and (2)), and for the sample after matching (Columns (3) and (4)). Panel B reports the probit regression results. The dependent variable is a dummy variable taking a value of one for accelerated offerings, and zero for non-accelerated offerings. This study further employs a number of other firm-level control variables (*CONTROLS$_{i,t-1}$*) that could potentially influence firm choice of SEO types. All control variables are measured over or at the end of the previous year, and winsorized at the 1% level, including firm size (*FSIZE*), liquidity (*LIQUID*), risk (*IDYRISK*), relative issue size (*OPTOTA*), shelf offering (*DSHELF, DSHELF_1*), logarithm of firm age (*lnAGE*), logarithm of book-to-market ratio (*lnBM*), leverage (*LEVRG*), the proportion of shares held by institutional investors (*INSOWN*), logarithm of total accrual at the balance sheet date immediately prior to the announcement (*lnACCRUAL*), and logarithm of the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period (*lnANALYST*). CMINDEX is the underwriter's reputation using the Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. The construction of the related variables is detailed in Appendix A. The symbols *** and ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Panel A: Mean differences						
	Before Matching			**After Matching**		
Variables	**Accelerated offerings**	**Non-Accelerated offerings**	***t*-test**	**Accelerated offerings**	**Non-Accelerated offerings**	***t*-test**
	(1)	**(2)**	**(1) vs. (2)**	**(3)**	**(4)**	**(3) vs. (4)**
ActBIG4	0.93	0.80	4.04***	0.89	0.84	2.28**
FSIZE	7.87	6.59	2.27**	7.10	7.05	1.34
LEVRG	27.59	26.55	2.67***	27.16	27.08	0.91
INSOWN	41.73	36.57	3.62***	40.05	39.28	0.63
lnBM	0.69	0.59	3.64***	0.67	0.66	1.62
lnAGE	14.46	11.75	4.23***	14.13	14.07	1.59
LIQUID	0.66	0.55	2.45**	0.64	0.62	1.07
OPTOTA	22.97	20.34	2.18**	21.30	21.17	0.97
IDYRISK	0.02	0.01	1.71*	0.02	0.01	1.58
DSHELF	0.66	0.44	3.76***	0.59	0.57	1.27
lnACCRUAL	0.06	0.03	5.74***	0.05	0.05	0.46
lnANALYST	6.54	5.31	3.02**	6.02	5.99	0.73
CMINDEX	0.03	0.01	4.31**	0.02	0.01	1.56

	Panel B: The effect of *ActBIG4* on Accelerated offerings	
Variables	
ActBIG4	0.460
	(2.01)**
FSIZE	0.091
	(1.69)*
LEVRG	0.294
	(1.72)*
INSOWN	0.052
	(0.36)
lnBM	0.065
	(0.68)
lnAGE	0.039
	(0.32)
LIQUID	-0.070
	(-0.78)
OPTOTA	0.040
	(0.39)
IDYRISK	-8.287
	(-1.35)
DSHELF	0.650
	(2.79)***
lnACCRUAL	0.029
	(0.40)
lnANALYST	0.460
	(1.48)
CMINDEX	0.017
	(2.09)**
Constant	-2.181
	(-4.46)***
Fixed effects	YI
Pseudo R²	0.157
Obs	1,836

Table 6: Alternative Measures of Audit Quality

This table presents the logistic regression results of the relation between audit quality and SEO issuance decisions. In Panel A, accruals quality (*ACCRUALS*) is used as a proxy for audit quality. *ACCRUALS* is the moving sum of the absolute value of discretionary accruals over the three-year period from t-1 to t-3, where discretionary accruals are calculated based on the modified Jones model (Dechow et al., 1995). In Panel B, mid-tier or national auditor (*NAAUD*) is used as a proxy for audit quality. *NAAUD* is a dummy variable which equals one for firms audited by BDO Seidman, Grant Thornton, McGladrey & Pullen, and Richard A. Eisner audit firms and zero for other audit firms in year *t-1*. The dependent variable, $SEOCHOICE_{i,t}$ takes a value of zero for non-accelerated offerings and one for accelerated offerings. This study further employs a number of other firm-level control variables ($CONTROLS_{i,t-1}$) that could potentially influence firm choice of SEO types. All control variables are measured over or at the end of the previous year, and winsorized at 1%, including firm size (*FSIZE*), liquidity (*LIQUID*), risk (*IDYRISK*), relative issue size (*OPTOTA*), shelf offering (*DSHELF,*), logarithm of firm age (*lnAGE*), logarithm of book-to-market ratio (*lnBM*), and leverage (*LEVRG*), the proportion of shares held by institutional investors (*INSOWN*), and logarithm of the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period (*lnANALYST*). CMINDEX is the underwriter's reputation using the Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. The construction of the related variables is detailed in Appendix A. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Variables	Alternative Measures of Audit Quality		
	(1)		**(2)**
ACCRUALS	-0.053	*NAAUD*	0.036
	(-3.16)***		(1.88)*
FSIZE	0.102	*FSIZE*	0.037
	(2.22)**		(1.20)
LEVRG	0.752	*LEVRG*	0.302
	(3.10)***		(1.77)*
INSOWN	0.311	*INSOWN*	0.145
	(2.44)**		(0.89)
lnBM	0.436	*lnBM*	0.112
	(1.88)*		(0.32)
lnAGE	0.070	*lnAGE*	0.010
	(1.11)		(0.13)
LIQUID	-0.180	*LIQUID*	-0.048
	(-2.43)***		(-0.59)
OPTOTA	0.007	*OPTOTA*	0.015
	(0.17)		(0.32)
IDYRISK	-7.045	*IDYRISK*	-2.995
	(-2.66)**		(-1.41)
DSHELF	1.494	*DSHELF*	0.542
	(5.09)***		(2.24)**
lnANALYST	0.073	*lnANALYST*	0.002
	(2.32)***		(0.72)
CMINDEX	0.0074	*CMINDEX*	0.0052
	(2.39)***		(1.79)*
Constant	-5.472	*Constant*	-1.579
	(-5.46)***		(-2.29)**
Fixed Effects	YI	*Fixed Effects*	YI
Pseudo R²	0.225	*Pseudo R²*	0.0763
Obs	3,280	*Obs*	199

Table 7: The effect of auditor tenures and auditor industry specialization on the SEO issuance choice decision

This table presents the logistic regression results of the effects of auditor tenure and auditor industry specialization on the relation between audit quality and SEO issuance decisions. The dependent variable, $SEOCHOICE_{i,t}$ takes a value of one for accelerated offerings and zero for non-accelerated offerings. *ActBIG4* is a dummy variable taking the value of one if an actual Big 4 audit firm is employed, and zero otherwise. Panel A reports the results for auditor tenure, while the results for audit firm industry specialization are reported in Panel B. *STENURE* is defined as young auditors whose tenure is three years or less, and longer-tenure auditors, *LTENURE*, as those with at least four years of tenure. *SPECIALIST* is a dummy variable taking the value of one for the market leader in audit work in the SIC two-digit industry by client sales, and zero otherwise, and consistent with Srinidhi et al. (2014). *Non-SPECIALIST* is a dummy, taking the value of one for other than the market leader in audit work in the SIC two-digit industry by client sales, and zero otherwise. This study further employs a number of other firm-level control variables ($CONTROLS_{i,t-1}$) that could potentially influence firm choice of SEO types. All control variables are measured over or at the end of the previous year, and winsorized at 1%, including firm size (*FSIZE*), liquidity (*LIQUID*), risk (*IDYRISK*), relative issue size (*OPTOTA*), shelf offering (*DSHELF*), logarithm of firm age (*lnAGE*), logarithm of book-to-market ratio (*lnBM*), and leverage (*LEVRG*), the proportion of shares held by institutional investors (*INSOWN*), logarithm of total accrual at the balance sheet date immediately prior to the announcement (*lnACCRUAL*), and logarithm of the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period (*lnANALYST*). CMINDEX is the underwriter's reputation using the Carter-Manaster (1990) ranking obtained from Jay Ritter's web page. The construction of the related variables is detailed in Appendix A. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Panel A: Short-tenure auditors vs. Long-tenure auditors	
Variables	**ACC**
ActBIG4*STENURE	0.260
	(5.73)***
ActBIG4*LTENURE	0.152
	(2.76)***
Constant	7.747
	(10.47)***
Firm-level controls	Yes
Fixed effects	YI
Pseudo R²	0.290
F-Statistics	11.22***
Obs	3,280
Panel B: Auditor industry specialization	
ActBIG4*Non-SPECIALIST	0.301
	(4.30)***
ActBIG4*SPECIALIST	0.168
	(2.32)**
Constant	8.649
	(8.49)***
Firm-level controls	Yes
Fixed effects	YI
Pseudo R²	0.277
F-Statistics	10.16***
Obs	3,280

Table 8: The role of corporate information and governance environment

This table reports the impacts of corporate information and governance environments on the relation between audit quality and SEO issuance decisions. We employ 2 proxies for corporate information environment, including analyst coverage (Panel A1) and the institutional ownership (Panel A2). The *ANALYST* variable refers to the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period, while the *INSOWN* variable is the proportion of shares held by institutional investors. For each fiscal year in the sample period, we sort firms into two groups (high and low information environment) based on the median value of each measure. We interact our audit quality variable with the high and low information asymmetry dummies and regress these two interaction variables on the accelerated offering method decision variable. For corporate governance environment, we employ board independence (Panel B1) and dedicated institutional ownership (Panel B2) as proxies for firm-level governance structure. For each fiscal year in the sample period, we sort firms into two groups (high and low corporate governance) based on the median value of each governance measure. The *BIND* variable refers to the percentage of independent directors on the board in year *t-1*, while the *IODED* is the percentage of dedicated institutional ownership in year *t-1*. We calculate the yearly percentages of shares outstanding held by dedicated institutional investors, taking the average over the four quarters of the firm's financial year *t-1* using data from the Thomson Reuters Institutional Holdings (13F) database. Our classification of dedicated institutions is based on Bushee (1998). All control variables are measured over or at the end of the previous year, and winsorized at the 1% level. The construction of the related variables is detailed in Appendix A. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Panel A: Corporate information environment

A1: *Analyst Coverage*		A2: *Institutional Ownership*	
Variables	**ACC**	**Variables**	**ACC**
ActBIG4*lowANALYST	0.213	ActBIG4*lowINSOWN	0.199
	(4.66)**		(3.76)***
ActBIG4*highANALYST	0.104	ActBIG4*highINSOWN	0.094
	(1.77)*		(1.70)*
Constant	1.916	Constant	1.787
	(7.43)***		(4.77)***
Firm-level controls	Yes	Firm-level controls	Yes
Fixed effects	YI	Fixed effects	YI
Pseudo R^2	0.199	Pseudo R^2	0.196
F-Statistics	10.11**	F-Statistics	9.73**
Obs	2,346	Obs	2,346

Panel B: Corporate governance environment

B1: *Board independence*		B2: *Dedicated ownership*	
Variables	**ACC**	**Variables**	**ACC**
ActBIG4*lowBIND	0.180	ActBIG4*lowIODED	0.226
	(4.99)***		(3.77)***
ActBIG4*highBIND	0.066	ActBIG4*highIODED	0.105
	(0.61)		(1.88)*
Constant	1.773	Constant	1.883
	(5.76)***		(4.98)***
Firm-level controls	Yes	Firm-level controls	Yes
Fixed effects	YI	Fixed effects	YI
Pseudo R^2	0.197	Pseudo R^2	0.193
F-Statistics	20.23***	F-Statistics	22.18 ***
Obs	1,660	Obs	1,660

Table 9: Issuance choice of SEOs and post-announcement audit fees

The dependent variable is *PostAUDFEE*, the natural logarithm of audit fees in the year following the announcement of SEO offerings (Model 1), and *AUDFEE/TA*, post-announcement audit fees divided by total assets (Model 2). Independent variables include firm size (*FSIZE*) based on total assets for Model 1, and the logarithm of market value of the issuing firm one month prior to the announcement (*lnMV*) for Model 2; *SEOCHOICE* is a dummy variable taking the value of one if the offering is an accelerated offering and zero otherwise; *DSHELF* is a dummy variable for shelf offerings, taking the value of one if the offering is a shelf offering and zero otherwise; *BIG4* is a dummy which equals one if a firm employs a Big 4 auditor and zero otherwise; *BUSY* is a dummy which takes the value of one for a firm's financial year ending between December 1st and March 31st; *SUBLOCAL* is the number of local subsidiaries; *SUBFOREIGN* is the number of foreign subsidiaries; *lnANALYST* is the logarithm of the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period; *LOSS* is a dummy variable which takes the value of one for a firm making a loss during the previous year and zero otherwise; *ROTA* is earnings before interest and tax relates to total assets; *SEGMENT* is the number of business segments obtained from the Compustat segment data; *LEVRG* is the ratio of total debt to total assets; *OPINION* is a dummy variable which takes the value of one if the audit firm gives a qualified opinion at the balance sheet date immediately prior to the announcement and zero otherwise; *lnACCRUAL* is the total accrual at the balance sheet date immediately prior to the announcement; *INSOWN* is the proportion of shares held by institutional investors; *LAGAFEE :* Logarithm of audit fee as at the balance sheet date prior to the seasoned equity offering announcement; *DAUDCHANGE*: A dummy variable, which equals one if there is a change in the auditor, and zero otherwise. The construction of the related variables is detailed in Appendix A. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Model 1: *lnAUDFEE*		Model 2: *AUDFEE/TA*	
SEOCHOICE	-0.140	SEOCHOICE	-0.014
	(-3.42)***		(-3.68)***
FSIZE	0.421	lnMV	0.001
	(38.30)***		(12.85)***
DSHELF	0.158	DSHELF	0.001
	(2.98)***		(0.11)
BIG4	0.474	BIG4	0.001
	(10.32)***		(4.71)***
BUSY	0.042	BUSY	0.012
	(1.59)		(2.30)**
SUBLOCAL	0.001	SUBLOCAL	0.001
	(1.10)		(2.31)**
SUBFOREIGN	0.002	SUBFOREIGN	0.002
	(3.33)***		(3.09)***
lnANALYST	0.217	lnANALYST	0.001
	(11.47)***		(2.53)**
LOSS	0.265	LOSS	0.002
	(7.57)***		(1.37)
ROTA	-0.205	ROTA	-0.008
	(-2.83)***		(-2.07)**
SEGMENT	0.172	SEGMENT	0.001
	(10.48)***		4.325
LEVRG	-0.203	LEVRG	-0.001
	(-3.65)***		(-5.47)***
OPINION	0.257	OPINION	0.001
	(8.41)***		(5.53)***
lnACCRUAL	0.238	lnACCRUAL	0.006
	(2.75)***		(9.45)***
INSOWN	0.098	INSOWN	-0.006
	(3.05)***		(1.47)
LAGAFEE	0.0256	LAGAFEE	0.0249
	(9.51)***		(9.48)***
DAUDCHANGE	0.0859	DAUDCHANGE	0.0696
	(0.82)		(0.68)
Constant	-3.827	Constant	0.011
	(-27.50)***		(14.70)***
Fixed effects	YI	Fixed effects	YI
R²	0.783	R²	0.6402
Obs	3,086	Obs	3,086

Table 10: Long-run abnormal returns

Panel A reports the monthly average abnormal returns (a_t) for the equally weighted calendar time portfolio method, using the three-factor, four-factor, five-factor and seven-factor models. In this method, event firms that announced SEO offerings in the last 36 calendar months form the basis of the calendar month portfolio. A single time-series regression is run with the excess return of the calendar portfolio as the dependent variable and the return on the three/four/five/ seven factors as the independent variables (the excess market return, a high-minus-low book to market, a small-minus-big capitalization factor, a momentum factor, and a liquidity factor). We use *OLS* and *WLS* regression to report the monthly average abnormal returns. Panel B reports *CARs* using the *IRATS* method combined with the three/four/five/ seven factors. The numbers reported are the sums of the intercepts a_t from cross-sectional regressions over the relevant event-time periods. We estimate *t*-statistics as the sum of the intercepts divided by the square root of the sum of the squares of the monthly standard errors, over the relevant event-time period. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

			Panel A: Calendar Time Methodology											
			Three-Factor Model –Fama & French (1993)			Four-Factor Model - Fama & French (1993), Carhart (1997)			Five-Factor Model - Fama & French (1993), Carhart (1997), Pástor & Stambaugh (2003)			Seven-Factor Model Fama & French (2015), Carhart (1997), Pástor & Stambaugh (2003)		
			All Firms	ACC Firms	FIRCOM Firms	All Firms	ACC Firms	FIRCOM Firms	All Firms	ACC Firms	FIRCOM Firms	All Firms	ACC Firms	FIRCOM Firms
36 months	EW-OLS	Alpha	-0.05	0.46	-0.14	-0.01	0.51	-0.11	-0.01	0.53	-0.09	0.08	0.49	0.01
		t-test	(-0.39)	(2.06)**	(-0.76)	(-0.19)	(2.39)**	(-0.61)	(-0.07)	(2.07)**	(-0.51)	(0.47)	(2.14)**	(0.07)
	EW-WLS	Alpha	-0.05	0.36	-0.12	-0.03	0.44	-0.09	-0.01	0.42	-0.09	0.05	0.45	0.04
		t-test	(-0.44)	(1.69)*	(-0.94)	(-0.27)	(2.21)**	(-0.56)	(-0.13)	(1.86)*	(-0.57)	(0.56)	(2.01)**	(0.27)

			Panel B: IRATS											
			Three-Factor Model –Fama & French (1993)			Four-Factor Model - Fama & French (1993), Carhart (1997)			Five-Factor Model - Fama & French (1993), Carhart (1997), Pástor & Stambaugh (2003)			Seven-Factor Model - Fama & French (2015), Carhart (1997), Pástor & Stambaugh (2003)		
			All Firms	ACC Firms	FIRCOM Firms	All Firms	ACC Firms	FIRCOM Firms	All Firms	ACC Firms	FIRCOM Firms	All Firms	ACC Firms	FIRCOM Firms
[+1, +12]		Sum of alpha	-0.66	4.36	-1.46	-0.16	5.64	-1.08	-0.29	5.36	-1.14	-0.04	5.04	-0.86
		t-test	(-0.69)	(1.91)*	(-1.41)	(-0.18)	(2.34)**	(-1.02)	(-0.27)	(2.19)**	(-1.01)	(-0.06)	(2.01)**	(-0.78)
[+1, +24]		Sum of alpha	-0.25	6.46	-1.38	0.92	8.45	-0.41	0.78	8.81	-0.58	3.08	9.78	1.98
		t-test	(-0.21)	(1.98)**	(-0.91)	(0.67)	(2.51)**	(-0.28)	(0.58)	(2.33)**	(-0.34)	(2.09)**	(2.71)***	(1.23)
[+1, +36]		Sum of alpha	-3.31	9.07	-5.18	-1.46	11.32	-3.59	-1.49	10.79	-3.21	3.01	12.91	1.45
		t-test	(-1.91)*	(2.21)**	(-2.81)***	(-0.89)	(2.68)***	(-2.01)**	(-0.89)	(2.24)**	(-1.68)*	(1.58)	(2.64)***	(0.71)

Appendix A: Variable definitions

Variables	Acronym	Description	Data sources
1. Dependent variables			
SEO issuance choice	*SEOCHOICE*	A dummy variable which takes the value of zero for non-accelerated equity offerings and one for accelerated offerings.	SDC/Factiva
Post-SEO audit fees	*PostAUDFEE*	The natural logarithm of audits fees in the year following announcement of SEO offerings	Audit Analytics
Monthly average abnormal returns	*MAAR*	Returns are estimated using the three-factor, four-factor, five-factor, and seven-factor models.	CRSP
Cumulative abnormal returns	*CAR*	Cumulative abnormal returns estimated using three-factor, four-factor, five-factor and seven-factor models	CRSP
2. Firm-level variables			
Big 4 auditors	*BIG4*	A dummy variable which equals one if a firm employs a Big 4 auditor, and zero otherwise.	Audit Analytics
Audit fees	*lnAUDFEE*	The natural logarithm of audit fees in $mil at the announcement of SEO offerings.	Audit Analytics
Firm size	*FSIZE*	Logarithm of total assets.	Compustat
Market value	*lnMV*	Logarithm of market value of the company one month prior to the announcement.	Compustat
Book-to-market ratio	*lnBM*	Logarithm of book-to-market ratio.	Compustat
EBITDA to total assets	*ROTA*	The ratio of earnings before interest, tax and depreciation to total assets.	Compustat
Asset growth	*ASSGRT*	Change in the log of total assets.	Compustat
Asset turnover	*ASSTO*	Sales divided by total assets.	Compustat
Liquidity	*LIQUID*	Logarithm of average proportionate bid-ask spread for the one-year period prior to the announcement of SEO offerings.	CRSP
Idiosyncratic risk	*IDYRISK*	The standard error for the 1-year period before the announcement date (return from day -260 today -2).	SDC
Stock return volatility	*SDVOL*	Standard deviation of average monthly returns.	CRSP
Standard deviation of earnings	*SDEAR*	Standard deviation of the EBITDA/Assets ratio over the previous 10-year period.	Compustat
Loss firms	*LOSS*	A dummy variable which takes the value of one for a firm making a loss during the previous year, and zero otherwise	Compustat
Relative issue size	*OPTOTA*	Offer proceeds relative to total assets.	SDC
Shelf offerings	*DSHELF*	A dummy variable which takes the value of one if the offerings are shelf offerings and zero otherwise.	SDC
Firm age	*lnAGE*	Logarithm of age where age of the firm is measured in years since the firm entered the Compustat database.	Compustat
Leverage	*LEVRG*	The ratio of total debt to total assets.	Compustat
Stock prices	*lnSP*	Logarithm of median monthly closing prices over a 12-month period.	CRSP
Herfindahl Index	*HERFINDAHL*	Sum of the squared market shares within each three-digit SIC industry.	Compustat

Industry litigation risk	*LITIGATION*	A dummy variable, which equals one if the firm operates in a high litigation risk industry, and zero otherwise.	Compustat
R&D to Sales	*R&D*	R&D to sales.	Compustat
R&D dummy	*R&D Dummy*	A dummy variable, which takes the value of one if R&D expenses are missing and zero otherwise.	Compustat
Business segments	*SEGMENT*	The number of business segments obtained from Compustat segment data.	Compustat
Qualified opinion	*OPINION*	A dummy variable which takes the value of one if the audit firm gives a qualified opinion and otherwise zero at the balance sheet date immediately prior to the announcement.	Audit Analytics
Financial year	*BUSY*	A dummy which takes the value of one for a firm's financial year ending between December 1st and March 31st.	Compustat
Local subsidiaries	*SUBLOCAL*	The number of local subsidiaries.	Osiris
Foreign subsidiaries	*SUBFOREIGN*	The number of foreign subsidiaries.	Osiris
Number of analysts	*lnANALYST*	The logarithm of the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period.	I/B/E/S
Total accrual	*lnACCRUAL*	The total accrual at the balance sheet date immediately prior to the announcement.	I/B/E/S
Institutional ownership	*INSOWN*	The proportion of shares held by institutional investors.	13 F
CM Index	*CMINDEX*	Underwritter's reputation using Carter-Manaster (1990) ranking. The dummy variable equals 1 if the Carter-Manaster Index is 9 or higher, 0 otherwise	Jay Ritter's web Page
Lag Audit Fee	*LAGAFEE*	Logarithm of audit fee as at the balance sheet date prior to the seasoned equity offering announcement	Audit Analytics
Auditor Switch	*DAUDCHANGE*	A dummy variable, which equals one if there is a change in the auditor, and zero otherwise.	Audit Analytics

Appendix B: Additional tests

Appendix B1: Pearson Correlation matrix (n=3,280)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	*BIG4*	1.00																	
2	*lnAUDFEE*	0.10***	1.00																
3	*SEOCHOICE*	0.10*	0.10*	1.00															
4	*FSIZE*	0.20***	0.10***	0.10***	1.00														
5	*R&D*	0.10**	0.10	0.00	0.00	1.00													
6	*LEVERG*	0.20***	0.10*	0.10	0.20***	0.00***	1.00												
7	*ASSTO*	0.10***	0.00	-0.10***	0.20***	-0.10	0.40***	1.00											
8	*TANGIBILITY*	0.20***	0.00	0.10***	0.00	0.00	-0.20***	0.00	1.00										
9	*SDVOL*	0.20***	0.00	-0.10***	0.10***	0.00	0.30***	0.10***	-0.70***	1.00									
10	*SDEAR*	0.00	0.00	-0.10*	0.10***	0.00	0.20***	0.20***	-0.10***	0.20***	1.00								
11	*lnSP*	0.30***	0.10***	0.00	0.20***	0.00	0.30***	0.00	-0.10***	0.30***	0.20	1.00							
12	*lnAGE*	0.10**	0.15**	0.00	0.10***	0.00	0.10***	0.10	0.00	0.10	0.10	0.10***	1.00						
13	*lnBM*	-0.20***	-0.10**	0.00	0.00	0.00	0.10	0.00	-0.20	0.10***	0.00	0.10***	-0.10***	1.00					
14	*IDRISK*	-0.10⁰***	-0.10***	-0.10	0.20***	0.00	0.10*	0.10	0.00	0.10***	0.10	0.00	0.10**	0.00	1.00				
15	*LITIGATION*	0.10	0.20***	0.00	0.10***	0.00	0.10*	0.00	0.00	0.20***	0.30	0.30*	0.20**	-0.20**	0.10	1.00			
16	*lnACCRUAL*	0.20***	0.10***	0.10***	0.30***	0.10*	0.20***	0.20	-0.10***	0.10***	0.00	0.10***	0.00	0.00	0.20***	0.10***	1.00		
17	*INSOWN*	0.10	0.10	0.10	0.20***	0.00	0.10*	0.10	0.00	0.10***	0.10	0.00	0.10**	0.00	0.00	0.10*	0.10	1.00	
18	*lnANALYST*	0.20	-0.10	0.10***	0.00	0.20***	0.00	0.10*	0.10	0.00	0.10***	0.10	0.00	0.10**	0.00	0.10***	0.00	0.10	1.00

The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Appendix B2: Determinants of the likelihood of choosing high-quality audit firms

This table presents the results for modelling the likelihood of a firm selecting a Big 4 auditor, which is used as a proxy for high audit quality. The sample includes all Compustat firms with more than $1 million in total assets in any financial year for the period 2002 to 2017. The dependent variable is *BIG4*, which equals one if a firm chooses a Big 4 auditor and zero otherwise. Independent variables include: *HERFINDAHL*, sum of the squared market shares within each three-digit SIC industry; *LEVRG*, the ratio of total debt to total assets; *ASSGRT*, change in the log of total assets; *FSIZE*, logarithm of total assets; *LITIGATION,* industry litigation risk dummy, which takes a value of unity if the firm is in a high litigation industry and zero otherwise; *TANGIBILITY*, Net PPE to total assets; *ASSTO,* sales divided by total assets; *R&D*, R&D to sales; *R&D Dummy*, a dummy variable which takes a value of 1 if R&D expenses are missing and zero otherwise; *SDVOL*, standard deviation of monthly return calculated for each firm each year; *lnBM*, logarithm of book-to-market ratio; *lnAGE*, logarithm of age where age of the firm is measured in years since the firm entered the Compustat database; *lnSP*, logarithm of median monthly closing prices over a 12-month period. The *z* statistics in parentheses are calculated from Huber/White heteroscedastic consistent errors. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Variables	BIG4
HERFINDAHL	12.561
	(2.69)***
LEVRG	0.038
	(2.13)**
ASSGRT	-0.008
	(-9.21)***
FSIZE	0.349
	(73.35)***
LITIGATION	-0.653
	(-49.42)***
TANGIBILITY	0.000
	(0.76)
ASSTO	0.186
	(20.84)***
R&D	0.001
	(2.70)***
R&D Dummy	-0.47
	(-56.54)***
SDVOL	2.87
	(9.29)***
lnBM	-0.478
	(-36.68)***
lnAGE	-0.026
	(-4.11)***
lnSP	0.053
	(5.39)***
Constant	-1.896
	(-40.69)***
Fixed effects	YI
Pseudo R²	0.249
Obs	76,963

To examine the impact of Big 4 audit firms on the issuance method choice in SEO offerings, we use two proxies for these auditors: *ExpBIG4*, and *BIG4* with *IMR* (the inverse Mills ratio). *ExpBIG4* is the modelled "expected" value of *BIG4*, following Chang et al. (2009). This study also follows the approach suggested by Lennox et al. (2012) and employs

BIG4 with *IMR* in our alternative model. *BIG4* is a dummy variable which takes the value of one if the firm engages one of the Big 4 audit firms as its auditor for the year immediately prior to the issue announcement date, and zero otherwise. In this approach, this study addresses selection bias arising from the choice of auditor by employing a probit regression to estimate the determinants of the auditor selection model, in association with the well-known two-stage Heckman correction process. Specifically, in the first stage, we model the likelihood of selecting a Big 4 auditor and obtain the *IMR*, while in the second stage we include *BIG4* with *IMR* as an alternative explanatory variable for *ExpBIG4* in our model.

We employ a probit regression approach covering all firms with at least $1 million in assets from the Compustat database during the period 2002-2017. This study uses various firm characteristics employed by previous studies to control for the possible endogeneity of the auditor quality selection decision. Consistent with Willenborg (1999) and Chaney et al. (2004), we employ firm size (*FSIZE*), the median monthly closing price over a 12-month period (*lnSP*), asset turnover (*ASSTO*), asset growth (*ASSGRT*), Herfindahl index (*HERFINDAHL*)[33], R&D disclosure (*R&D*, *R&D Dummy*), leverage ratio (*LEVRG*), and stock return volatility (*SDVOL*) as determinants of the use of a Big 4 auditor. Krishnan and Krishnan (1997) argue that big audit firms are normally reluctant to accept high risk clients because of the potential damage to their reputation and threat of litigation. In line with this argument, this study includes, among our variables, a dummy variable indicating industry litigation risk (*LITIGATION*). We expect that high growth and valuable firms hire large auditors more frequently than choosing small audit firms. We also include the book-to-market ratio (*lnBM*) and Net PPE to total assets (*TANGIBILITY*) ratio as proxies for high growth and asset intensive firms. Firm age (*lnAGE*) is another relevant factor affecting the choice of auditor that we include in the model. Mature firms have greater market share than

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[33] Chaney et al. (2004) report that agency costs tend to be higher in highly leveraged clients and such firms prefer to hire big auditors with an excellent reputation to reduce agency costs. The Herfindahl index considers the relative importance of firms in a given industry. We, therefore, expect that more market concentrated firms are likely to choose big auditors rather than small auditing firms.

younger firms and are more likely to hire top audit firms. We report the regression estimation results in Appendix B2 above. The table shows that the estimated coefficient on the *HERFINDAHL* variable has a positive sign and is statistically insignificant, which indicates that market concentration does not play any role for US firms in choosing Big-4 auditors. Further, the estimated coefficients on the *FSIZE, R&D, LEVRG*, *ASSTO*, *SDVOL*, and *lnSP* variables are positive and statistically significant, suggesting that firms that are larger, firms with higher R&D and leverage, firms efficiently deploying resources, and firms with higher stock prices and greater return volatility, are more likely to hire Big 4 auditors. We also find that older firms (*lnAGE*), firms with lower growth potential (*lnBM*), and firms operating in industries with low litigation risk (*LITIGATION*) tend to employ non-Big 4 auditors. This latter finding is inconsistent with the Krishnan and Krishnan (1997) finding regarding auditor preferences based on firm-level litigation risk.

Appendix B3: Determinants of audit fees

This table presents the results for modelling the determinants of corporate audit fees. The sample includes all Compustat companies with more than $1 million in total assets in any financial year for the period 2002 to 2017. The dependent variable is *lnAUDFEE*, the natural logarithm of audit fees (in $mil) at the balance sheet date immediately prior to the announcement. Independent variables include: *LITIGATION,* litigation risk industry dummy, which takes the value of one if the firm operates in a high litigation industry and zero otherwise; *LOSS,* a dummy variable which takes the value of one for a firm making a loss during the previous year and zero otherwise; *FSIZE*, the natural logarithm of total assets; *lnBM,* the natural logarithm of book-to-market ratio; *LEVRG*, the ratio of total debt to total assets; *TANGIBILITY*, Net PPE to total assets; *ASSTO,* sales divided by total assets; *lnAGE*, the natural logarithm of age where age of the firm is measured in years since the firm entered the Compustat database; *BUSY*, a dummy which takes the value of one for a firm's financial year ending between December 1 and March 31, and zero otherwise; *BIG4*, a dummy which equals one if a firm chooses a Big 4 auditor and zero otherwise; *SUBFOREIGN*, the number of foreign subsidiaries; *SUBLOCAL*, the number of local subsidiaries. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Variables	*lnAUDFEE*
LITIGATION	0.220
	(31.13)***
LOSS	0.365
	(53.62)***
FSIZE	0.590
	(178.90)***
lnBM	-0.174
	(-28.16)***
LEVRG	0.013
	(3.96)***
TANGIBILITY	0.000
	(4.63)***
lnAGE	0.029
	(6.93)***
BUSY	0.099
	(11.63)***
BIG4	0.623
	(53.62)***
SUBFOREIGN	0.001
	(9.12)***
SUBLOCAL	0.000
	(2.54)**
Constant	-4.521
	(-263.96)***
Fixed effects	YI
R^2	0.715
Obs	70,027

Auditor fee is also expected to be an endogenous variable in the subsequent analysis (see Sandra and Patrick, 1996). To mitigate this possible endogeneity problem,[34] we estimate a first-stage audit fees prediction model using the specification in Table B3. Further, rather than using the predicted value as in the Big 4 auditor estimation process above, we employ

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[34] Note that in the robustness analysis section we report the regression model results using the original audit fees variable as the key explanatory variable and find similar results to the variable from the predicted model process.

the unexpected (residual) value from the estimated regression as this is envisaged to best represent a large auditor fee premium and/or excess audit effort component that will be correlated with audit quality. Specifically, we examine the determinants of auditor fees using all US firms with more than $1 million worth of assets from the Compustat database during the 2002-2017 period. The dependent variable is *lnAUDFEE* which is computed as the natural logarithm of audit fees (in $million). To mitigate further the effect of endogeneity, we choose the audit fees figure at the balance sheet date immediately prior to the SEO announcement and run a regression based on firm characteristics that are lagged for two years. This study employs a wide range of firm characteristics employed by previous studies modelling auditor fees (Chan et al., 1993; Sandra and Patrick, 1996; Krishnan and Krishnan, 1997; Langendijk, 1997; Jha and Chen, 2015). Prior studies conclude that complexity in terms of scope of operations has a significant impact on the level of the audit fees.[35] We, hence, include among our variables the number of local subsidiaries (*SUBLOCAL*) and foreign subsidiaries (*SUBFOREIGN*). If the business operations of the client are more complex, i.e. more diversified or having foreign operations, then audit work will also be increasingly complex. More subsidiaries require more auditing and, therefore, audit firms will charge higher fees. Sandra and Patrick (1996) argue that auditors of group companies that have a number of subsidiaries reap high rewards for examining individual financial statements and assessing the accuracy of consolidated financial statements. They further state that subsidiaries in different countries often have to comply with a variety of statutory and professional requirements for disclosure and this entails additional audit testing. This implies that such companies have to bear additional charges for audit work. This study also uses the *BUSY* variable as a control variable in the regression. The busy time for audits is the period in which most companies' accounts are audited. The financial year of most companies in the US ends on December 31st. As a majority of companies start their audits after this date, this

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[35] Prior studies which support the complexity variable as a determinant of audit fee are Taylor and Baker (1981), Collier and Gregory (1996), Sandra and Partrick (1996), Langendijk (1997), among others.

would be the January through March timeframe in the US. It is generally believed that auditors expect better recoveries on standard charge out rates for busy session audits. Sandra and Patrick (1996), for instance, find a positive and significant association between audit fees and the month of the audit.

We also employ a set of other firm-level control variables in the model. Firm size (*FSIZE*) is expected to be a significant explanatory variable in determining audit fees since auditors generally employ a litigation-based approach to their auditing work (Chan et al., 1993). We also use *LOSS* and *LITIGATION* as proxies to measure firm risk. Krishnan and Krishnan (1997) argue that the large audit firms are reluctant to accept high-risk firms due to the potential damage to their reputation and threat of litigation. At the same time, more-risky firms generally pay higher audit fees to obtain external audit services. Simunic (1980) argues that auditors charge a higher fee to compensate for the greater risk. Further, we employ the *TANGIBILITY* and *lnBM* variables to proxy for asset intensive and high growth firms. We expect that high investment and growth firms hire big auditors more often than employing small audit firms, and for larger firms to generally pay higher audit fees. This is because big auditors enjoy a good reputation, retain high quality staff and resources, and have the technical expertise to complete challenging auditing tasks. Firm age (*lnAGE*) could be another relevant factor affecting audit fees for a number of reasons. The potential for well-developed control systems in mature firms may lead to higher audit fees associated with checking the accuracy of the control systems, although audit firms may also place greater reliance on strong internal controls to mitigate the extent of required audit work. We report our regression results in Appendix B3 above.

We find that firms that are larger, older, have more subsidiaries, exhibit higher risk and greater leverage, and firms with greater growth potential pay higher audit fees. We use the unexpected (residual) value of audit fees based on these regression results as an independent

variable in the second stage analysis to proxy for audit quality in terms of a big auditor premium or excess audit effort.

Appendix B4: Audit fees as a proxy for audit quality

This table presents the logistic regression results of the relation between audit quality and SEO issuance decisions. The dependent variable is a dummy variable taking a value of one for accelerated offerings, and zero for firm commitment offerings. In Model (1) we employ Actual audit fees to proxy for audit quality; while Models (2) uses the Residual audit fees variable estimation to proxy for audit quality. The model further employs a number of other firm-level control variables ($CONTROLS_{i,t-1}$) that could potentially influence firm choices of SEO types. All control variables are measured over or at the end of the previous year, and winsorized at the 1% level, including firm size (*FSIZE*), liquidity (*LIQUID*), risk (*IDYRISK*), relative issue size (*OPTOTA*), shelf offering (*DSHELF, DSHELF_1*), logarithm of firm age (*lnAGE*), logarithm of book-to-market ratio (*lnBM*), leverage (*LEVRG*), the proportion of shares held by institutional investors (*INSOWN*), logarithm of total accrual at the balance sheet date immediately prior to the announcement (*lnACCRUAL*), and logarithm of the maximum number of analysts making annual earnings forecasts in any month over the last 12-month period (*lnANALYST*). The construction of the related variables is detailed in the Appendix A. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

	Actual Audit Fees (1)		**Residual Audit Fees (2)**
ActAUDFEE	**0.496**	*ResidualAUDFEE*	**0.561**
	(3.06)*		**(3.49)***
FSIZE	0.125	*FSIZE*	0.142
	(1.71)*		(1.93)*
LEVRG	0.646	*LEVRG*	0.731
	(2.15)**		(2.41)**
INSOWN	-0.025	*INSOWN*	-0.028
	(-0.47)		(-0.52)
lnBM	0.065	*lnBM*	0.073
	(1.89)**		(2.13)**
lnAGE	0.027	*lnAGE*	0.031
	(0.21)*		(0.23)
LIQUID	0.003	*LIQUID*	0.003
	(0.02)		(0.02)
OPTOTA	-0.002	*OPTOTA*	-0.002
	(-0.06)		(-0.06)
IDYRISK	-8.674	*IDYRISK*	-9.819
	(-1.87)*		(-2.11)**
DSHELF	0.935	*DSHELF*	1.041
	(4.37)***		(4.94)***
DSHELF_1	0.201	*DSHELF_1*	0.228
	(0.73)		(0.82)
lnACCRUAL	0.029	*lnACCRUAL*	0.033
	(0.39)		(0.44)
lnANALYST	-0.596	*lnANALYST*	-0.675
	(-0.67)		(-0.75)
Constant	-3.095	*Constant*	-3.504
	(-4.36)***		(-4.93)***
Fixed effects	YI	*Fixed effects*	YI
R²	0.175	*R²*	0.179
Obs	3,087	*Obs*	3,087