International Review of Financial Analysis 83 (2022) 102227

Contents lists available at ScienceDirect

International Review of Financial Analysis

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

Audit quality and seasoned equity offerings methods

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ARTICLE INFO

JEL classification:
G13
G32
M42

Keywords:
Seasoned equity offerings
Audit quality
Audit pricing
Propensity score matching

ABSTRACT

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.

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 & Majluf, 1984).[1] In the literature on seasoned equity offerings (SEOs) where firms raise additional capital from the equity market, the certification hypothesis (Beatty & Ritter, 1986; Booth & Smith, 1986; Carter & 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. Furthermore, we propose that this certification mechanism is relevant to SEO issuing firms in terms of increasing the likelihood of successfully completing shorter issue processes through attracting both underwriter and investor participation, with audit quality having an important role in reducing underwriter engagement risk and acting as a substitute for more extensive due diligence assessment of issuing firms. In this study, therefore, we examine the role of firm auditor quality in determining the choice of SEO issue methods as a certification and monitoring mechanism and also aiding in underwriter attraction. We also examine the relation between SEO methods and post-SEO firm 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 either bought deals or

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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 & Masulis, 1992; Bortolotti et al., 2008; Chang et al., 2009; Autore et al., 2011).

https://doi.org/10.1016/j.irfa.2022.102227
Received 23 December 2021; Received in revised form 27 May 2022; Accepted 31 May 2022
Available online 5 June 2022

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	9017
- IPO offering	2419
- Duplication offering	2175
- 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	3280

Panel B: Summary of sample selection and distribution			
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	2628	3280

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	2628	3280

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.

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).[19] *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 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.

Following the current literature (Chang et al., 2009; Lennox, Francis, & Wang, 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

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

Table 2
Seasoned equity offerings and sample firm characteristics.

Characteristics		ACC	Non-ACC	MW Test
FSIZE ($m)	Mean	8477.56	13,610.16	
	Median	2114.03	816.84	9.63***
MV ($m)	Mean	3621.52	2461.86	
	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**

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; and *CMINDEX* is the underwriter's reputation using the Carter and Manaster (1990) ranking obtained from Jay Ritter's web page. The symbols ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

(Sandra & 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 (Francis & Wang, 2008; Krishnan, 2003; Teoh & Wong, 1993) 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

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

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 R^2	0.249	*Pseudo* R^2	0.265
Obs	3280	*Obs*	3280

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*), and *CMINDEX* is the underwriter's reputation using the Carter and 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.

constrain aggressive earnings management (Becker et al., 1998; Francis, Maydew, & 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 & 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 binary response Y (*SEOCHOICE)* by the key independent variable (*ActBIG4*) and a set of control variables (*CONTROLS*) is specified in the model as follows:

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

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, Minutti-Meza, and Zhang (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, Hutton, and Kovacs (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.

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.[20] *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 suggests

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

Table 4
Firm-fixed effects.

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 R^2	0.392	*Pseudo* R^2	0.405
Obs	3280	*Obs*	3280

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*), and *CMINDEX* is the underwriter's reputation using the Carter and 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.

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.

4.2.2. Propensity score matching approach

Lee, Poon, and Sinnakkannu (2018) 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.[21] The 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.

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

In this section, we employ a number of additional tests relating to

[21] For details, see Rosenbaum and Rubin (1983), Heckman, Ichimura, and Todd (1997), Li and Zhao (2006), Bertrand and Zitouna (2008). According to Bertrand and Zitouna (2008), the propensity scores are the probability of receiving 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 & Wahba, 2002), and combines each company's pre-treatment characteristics into a single indicator variable.

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

Panel A: Mean differences						
Variables	Before Matching			After Matching		
	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 R^2	0.157
Obs	1836

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*), and *CMINDEX* is the underwriter's reputation using the Carter and 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.

Table 6
Alternative Measures of Audit Quality.

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)**		(1.78)*
Constant	−5.472	*Constant*	−1.579
	(−5.46)***		(−2.29)**
Fixed Effects	YI	*Fixed Effects*	YI
Pseudo R^2	0.225	*Pseudo* R^2	0.0763
Obs	3280	*Obs*	699

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*), and *CMINDEX* is the underwriter's reputation using the Carter and 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.

alternative variable specification to verify our results.[22] 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.[23] DuCharme, Malatesta, and Sefcik (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 (Balsam, Krishnan, & Yang, 2003; Becker et al., 1998; Dunn & Mayhew, 2004; Francis et al., 1999; Krishnan, 2003). 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, Sloan, & Sweeney, 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*), 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

[22] 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 (Asthana et al., 2009; Craswell, Francis, & Taylor, 1995). 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.

[23] 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.

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

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 R^2	0.290
Coefficient difference F-test	11.22***
Obs	3280
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 R^2	0.277
Coefficient difference F-test	10.16***
Obs	3280

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*), and *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.

of higher audit quality (represented by lower discretionary accruals) are more likely to use accelerated offerings than other SEO issue methods.

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 et al., 1999; Francis & Krishnan, 2002), a number of other studies have documented mixed evidence when they use mid-tier auditors to proxy for audit quality.[24] 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, Giroux, Myers, and Omer (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 rerun 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, 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.[25] 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 & 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 be a substitute audit quality signal and may increase the likelihood of firms undertaking accelerated offerings independent of

[24] For example, Boone, Khurana, and Raman (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.

[25] 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, Myers, and Omer (2003), Ghosh and Moon (2005), and Gul, Jaggi, and Krishnan (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 (Chen et al., 2016; Gul et al., 2009; Myers et al., 2003).

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 (Carcello & Nagy, 2004; Chen, Gul, Truong, & Veeraraghavan, 2016; Gul, Fung, & Jaggi, 2009; Johnson, Khurana, & Reynold, 2002). 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.

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.[26] Prior research also shows that firms employing industry specialist auditors are associated with higher earnings quality (Balsam et al., 2003; Krishnan, 2003). Srinidhi, He, and Firth (2014) find that strongly-governed family firms are more likely to choose specialist auditors 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 specialization 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 specialization, 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

[26] 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, Naiker, and Pacheco (2007), Lim and Tan (2008), Gul et al. (2009) document similar results.

Table 8
The role of corporate information and governance environment.

Panel A: Corporate information environment

A1: *Analyst Coverage*		A2: *Institutional Ownership*	
Variables	ACC	Variables	ACC
*ActBIG4*lowANALYST*	0.213 (4.66)***	*ActBIG4*lowINSOWN*	0.199 (3.76)***
*ActBIG4*highANALYST*	0.104 (1.77)*	*ActBIG4*highINSOWN*	0.094 (1.70)*
Constant	1.916 (7.43)***	*Constant*	1.787 (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
Coefficient difference F-test	10.11**	*Coefficient difference F-test*	9.73**
Obs	2346	*Obs*	2346

Panel B: Corporate governance environment

B1: *Board independence*		B2: *Dedicated ownership*	
Variables	ACC	Variables	ACC
*ActBIG4*lowBIND*	0.180 (4.99)***	*ActBIG4*lowIODED*	0.226 (3.77)***
*ActBIG4*highBIND*	0.066 (0.61)	*ActBIG4*highIODED*	0.105 (1.88)*
Constant	1.773 (5.76)***	*Constant*	1.883 (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
Coefficient difference F-test	20.23***	*Coefficient difference F-test*	22.18 ***
Obs	1660	*Obs*	1660

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.

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.[27] Demiralp, D'Mello, Schlingemann, and Subramaniam (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.[28]

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.[29,30] 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 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.

We further examine the firm corporate governance environment as a

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

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
R^2	0.7830	R^2	0.6402
Obs	3086	*Obs*	3086

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* is the logarithm of audit fee as at the balance sheet date prior to the seasoned equity offering announcement; and *DAUDCHANGE* is 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.

[27] 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 asymmetry. For instance, Kothari, Li, and Short (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, Mansi, and Mazboudi (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, Loureiro, and Taboada (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.

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

[29] 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., Hope, 2003; Lang & Lundholm, 1996; Yu, 2008).

[30] 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, Moshirian, Pham, & Zein, 2006; Ng, Wu, Yu, & Zhang, 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.

channel or moderating influence on the relation between audit quality and SEO issue method decisions.[31] 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. 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.[32]

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 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 (Barua, Lennox, & Raghunandan, 2020; Collier & Gregory, 1996; Jha & Chen, 2015; Seetharaman, Gul, & Lynn, 2002). 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; *INSOWN* is the proportion of shares held by institutional investors; *LAGAFEE* is the logarithm of audit fee as at the balance sheet date prior to the seasoned equity offering announcement; and *DAUDCHANGE* is a dummy variable which equals one if there is a change in the auditor, and zero otherwise.[33]

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).

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 & Ritter, 2000; Peyer & Vermaelen,

[31] Extant research on SEOs links issuance method choice with agency problems (Leuz et al., 2003; Teoh et al., 1998) 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.

[32] 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.

[33] We would like to thank the anonymous reviewer for the suggestion to control for the potential change in auditor.

Table 10
Long-run abnormal returns.

Panel A: Calendar Time Methodology

			Three-Factor Model –Fama and French (1993)			Four-Factor Model - Fama and French (1993), Carhart (1997)			Five-Factor Model - Fama and French (1993), Carhart (1997), Pastor and Stambaugh (2003)			Seven-Factor Model Fama and French (2015), Carhart (1997), Pastor and 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 and French (1993)			Four-Factor Model - Fama and French (1993), Carhart (1997)			Five-Factor Model - Fama and French (1993), Carhart (1997), Pastor and Stambaugh (2003)			Seven-Factor Model - Fama and French (2015), Carhart (1997), Pastor and 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)

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.

2008; Hertzel & Zhi, 2010) and the monthly cumulative average abnormal returns (*CAR*) using Ibbotson's (1975) returns across time and security (*IRATS*) method.[34] The purpose of this analysis is to assess the certification effects of firms completing 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 & French, 1993); the four-factor model (Fama & 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.

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 (Blackwell, Noland, & Winters, 1998; Hogan, 1997; Pittman & 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.[35]

Data availability

Data will be made available on request.

Acknowledgments

The authors wish to thank Brian Lucey (the Editor), and two anonymous Referees for very helpful comments and suggestions. We thank the members of the UD_DUE Teaching and Research Team in Corporate Finance and Asset pricing (TRT-CFAP), the participants at the 2019 Australasian Finance and Banking Conference, the 2020 Financial Markets and Corporate Governance Conference, and seminars at La Trobe Business School and Westminster Business School, for very fruitful comments and suggestions. We also thank the project titled "Building a shared electronic library for higher education institutions in Vietnam" in promoting collaboration and sharing in research. This research is funded by Funds for Science and Technology Development of the University of Danang under project number B2021-DN04-02. Xuan Vinh Vo acknowledges funding from the University of Economics Ho Chi Minh city (UEH University). All remaining errors are our own.

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

[35] Choi, Choi, and Sohn (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, Kim, Liu, & Simunic, 2008).

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
Underwritter's reputation	*CMINDEX*	Underwritter's reputation using Carter and Manaster (1990) ranking. The dummy variable equals 1 if the Carter-Manaster Index is 9 or higher, and 0 otherwise.	Jay Ritter's web Page
Audit fee before SEO	*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

B.1. Pearson Correlation matrix (n = 3280)

		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*	−0.10[0]***	−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.*

B.2. 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 R^2	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, Jeter, and Shivakumar (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*),[36] 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 younger firms and are more likely to

[36] 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.

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.

B.3. 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 & Patrick, 1996). To mitigate this possible endogeneity problem,[37] 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 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, Ezzamel, & Gwilliam, 1993; Jha & Chen, 2015; Krishnan & Krishnan, 1997; Langendijk, 1997; Sandra & Patrick, 1996). Prior studies conclude that complexity in terms of scope of operations has a significant impact on the level of the audit fees.[38] 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

[37] 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.

[38] 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.

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 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.

B.4. 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
R^2	0.175	R^2	0.179
Obs	3087	*Obs*	3087

References

Abbott, L. J., Parker, S., & Gary, F. P. (2006). Earnings management, litigation risk, and asymmetric audit fee responses. *Auditing: A Journal of Practice & Theory, 25*(1), 85–98.

Alhadab, M., & Clacher, I. (2018). The impact of audit quality on real and accrual earnings management around IPOs. *The British Accounting Review, 50*, 442–461.

Armstrong, C. S., Foster, G., & Taylor, D. (2016). Abnormal accruals in newly public companies: Opportunistic misreporting or economic activity? *Management Science, 62*, 1316–1338.

Asthana, S., Balsam, S., & Kim, S. (2009). The effect of Enron, Andersen and Sarbanes-Oxley on the US market for audit services. *Accounting Research Journal, 22*, 4–26.

Autore, D. M., Hutton, I., & Kovacs, T. (2011). Accelerated equity offers and firm quality. *European Financial Management, 17*, 835–859.

Autore, D. M., Kumar, R., & Shome, D. K. (2008). The revival of shelf-registered corporate equity offerings. *Journal of Corporate Finance, 14*, 32–50.

Ball, R., Jayaraman, S., & Shivakumar, L. (2012). Audited financial reporting and voluntary disclosure as complements: A test of the confirmation hypothesis. *Journal of Accounting and Economics, 53*, 136–166.

Ball, R., & Shivakumar, L. (2008). Earnings quality at initial public offerings. *Journal of Accounting and Economics, 45*, 324–349.

Balsam, S., Krishnan, J., & Yang, J. S. (2003). Auditor industry specialization and earnings quality. *Auditing: A Journal of Practice & Theory, 22*, 71–97.

Balvers, R. J., McDonald, B., & Miller, R. E. (1988). Underpricing of new issues and the choice of auditor as a signal of investment banker reputation. *The Accounting Review, 63*, 605–622.

Barua, A., Lennox, C., & Raghunandan, A. (2020). Are audit fees discounted in initial year audit engagements? *Journal of Accounting and Economics, 69*(2–3), Article 101282.

Beatty, R. P., & Ritter, J. R. (1986). Investment banking, reputation and the underpricing of initial public offerings. *Journal of Financial Economics, 15*, 213–232.

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

Bell, T. B., Landsman, W. R., & Shackelford, D. A. (2001). Auditors' perceived business risk and audit fees: Analysis and evidence. *Journal of Accounting Research, 39*(1), 35–43.

Bertrand, O., & Zitouna, H. (2008). Domestic versus cross-border acquisitions: Which impact on the target firms' performance? *Applied Economics, 40*, 2221–2238.

Blackwell, D., Noland, T., & Winters, D. (1998). The value of auditor assurance: Evidence from loan pricing. *Journal of Accounting Research, 36*, 57–70.

Blankley, A. I., Hurtt, D. N., & MacGregor, J. E. (2012). Abnormal audit fees and restatements. *Auditing: A Journal of Practice & Theory, 31*, 79–96.

Boone, J. P., Khurana, I. K., & Raman, K. K. (2010). Do the big 4 and the second-tier firms provide audits of similar quality? *Journal of Accounting and Public Policy, 29*(4), 330–352.

Booth, J., & Smith, R. (1986). Capital raising, underwriting and the certification hypothesis. *Journal of Financial Economics, 15*, 261–281.

Bortolotti, B., Megginson, W., & Smart, S. B. (2008). The rise of accelerated seasoned equity underwritings. *Journal of Applied Corporate Finance, 20*, 35–57.

Burch, T. R., Christie, W. G., & Nanda, V. (2004). Do firms time equity offerings? Evidence from the 1930s and 1940s. *Financial Management, 33*, 5–23.

Bushee, B. J. (1998). The influence of institutional investors on myopic R&D investment behavior. *The Accounting Review*, 305–333.

Caramanis, V., & Lennox, C. (2008). Audit effort and earnings management. *Journal of Accounting and Economics, 45*, 116–138.

Carcello, J., & Nagy, A. (2004). Client size, auditor specialization and fraudulent financial reporting. *Managerial Auditing Journal, 19*(5), 651–668.

Carhart, M. M. (1997). On persistence in mutual fund performance. *Journal of Finance, 52*, 57–82.

Carter, R., & Manaster, S. (1990). Initial public offerings and underwriter reputation. *Journal of Finance, 45*, 1045–1067.

Cassell, C. A., Giroux, G. A., Myers, L. A., & Omer, T. C. (2013). The emergence of second-tier auditors in the US: Evidence from investor perceptions of financial reporting credibility. *Journal of Business Finance & Accounting, 40*(3–4), 350–372.

Cecchini, M., Jackson, S., & Liu, X. (2012). Do initial public offering firms manage accruals? Evidence from individual accounts. *Review of Accounting Studies, 17*, 22–40.

Chahine, S., Mansi, S., & Mazboudi, M. (2015). Media news and earnings management prior to equity offerings. *Journal of Corporate Finance, 35*, 177–195.

Chan, P., Ezzamel, M., & Gwilliam, D. (1993). Determinants of audit fees for quoted UK companies. *Journal of Business Finance & Accounting, 20*, 765–786.

Chaney, P. K., Jeter, D. C., & Shivakumar, L. (2004). Self-selection of auditors and audit pricing in private firms. *The Accounting Review, 79*, 51–72.

Chang, X., Dasgupta, S., & Hilary, G. (2009). The effect of auditor quality on financing decisions. *The Accounting Review, 84*, 1085–1117.

Chemmanur, T., & Fulghieri, P. (1994). Investment bank reputation, information production, and financial intermediation. *Journal of Finance, 49*(1), 57–79.

Chemmanur, T. J., & Paeglis, I. (2005). Management quality, certification, and initial public offerings. *Journal of Financial Economics, 76*, 331–368.

Chen, Y., Gul, F. A., Truong, C., & Veeraraghavan, M. (2016). Auditor client specific knowledge and internal control weakness: Some evidence on the role of auditor tenure and geographic distance. *Journal of Contemporary Accounting and Economics, 12*(2), 121–140.

Chi, W., Lisic, L. L., & Pevzner, M. (2011). Is enhanced audit quality associated with greater real earnings management? *Accounting Horizons, 25*, 315–335.

Choi, A., Choi, J. H., & Sohn, B. C. (2018). The joint effect of audit quality and legal regimes on the use of real earnings management: International evidence. *Contemporary Accounting Research, 35*(4), 2225–2257.

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

Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics, 50*, 2–19.

Collier, P., & Gregory, A. (1996). Audit committee effectiveness and the audit fee. *The European Accounting Review, 5*, 177–198.

Comprix, J., & Huang, H. (2015). Does auditor size matter? Evidence from small audit firms. *Advances in Accounting, 31*(1), 11–20.

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

Cronqvist, H., & Nilsson, M. (2005). The choice between rights offerings and private equity placements. *Journal of Financial Economics, 78*, 375–407.

Daniel, K., Hirshleifer, D., & Subrahmanyam, A. (1998). Investor psychology and security market under and overreactions. *Journal of Finance, 53*, 1839–1885.

DeAngelo, L. E. (1981). Auditor size and audit quality. *Journal of Accounting and Economics, 3*, 183–199.

Dechow, P., Sloan, R., & Sweeney, A. (1995). Detecting earnings management. *The Accounting Review, 170*, 193–225.

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

Dehejia, R., & Wahba, S. (2002). Propensity score-matching methods for nonexperimental causal studies. *Review of Economics and Statistics, 84*(1), 151–161.

Demiralp, I., D'Mello, R., Schlingemann, F. P., & Subramaniam, V. (2011). Are there monitoring benefits to institutional ownership? Evidence from seasoned equity offerings. *Journal of Corporate Finance, 17*(5), 1340–1359.

DuCharme, L., Malatesta, P., & Sefcik, E. (2004). Earnings management, stock issues, and shareholder lawsuits. *Journal of Financial Economics, 71*, 27–49.

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

Dutordoir, M., Strong, N., & Ziegan, M. C. (2014). Does corporate governance influence convertible bond issuance? *Journal of Corporate Finance, 24*, 80–100.

Eckbo, B., & Masulis, R. (1992). Adverse selection and the rights offer paradox. *Journal of Financial Economics, 32*, 293–332.

Eckbo, B. E., Masulis, R. W., & Norli, O. (2000). Seasoned public offerings: Resolution of the 'new issues puzzle'. *Journal of Financial Economics, 56*, 251–291.

Eckbo, B. E., Masulis, R. W., & Norli, O. (2007). Security offerings. *Handbook of Corporate Finance: Empirical Corporate Finance, 1*, 233–373.

Eshleman, J. D., & Guo, P. (2014). Do big 4 auditors provide higher audit quality after controlling for the endogenous choice of auditor? *Auditing: A Journal of Practice & Theory, 33*(4), 197–219.

Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics, 33*, 3–56.

Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. *Journal of Financial Economics, 116*, 1–22.

Fauver, L., Loureiro, G., & Taboada, A. G. (2017). The impact of regulation on information quality and performance around seasoned equity offerings: International evidence. *Journal of Corporate Finance, 44*(C), 73–98.

Fernando, C. S., Gatchev, V. A., & Spindt, P. A. (2005). Wanna dance? How firms and underwriters choose each other. *Journal of Finance, 60*(5), 2437–2469.

Fields, L. P., & Mais, E. L. (1994). Managerial voting rights and seasoned public equity issues. *Journal of Financial and Quantitative Analysis, 29*, 445–458.

Fortin, S., & Pittman, J. (2007). The role of auditor choice in debt pricing in private firms. *Contemporary Accounting Research, 24*, 859–896.

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

Francis, J. R., & Krishnan, K. (1999). Accounting accruals and auditor reporting conservatism. *Contemporary Accounting Research, 16*(1), 135–166.

Francis, J. R., & Krishnan, K. (2002). Evidence on auditor risk management strategies before and after the private securities litigation reform act of 1995. *Asia-Pacific Journal of Accounting & Economics, 9*(2), 135–157.

Francis, J. R., Maydew, L. E., & Sparks, H. C. (1999). The role of big 6 auditors in the credible reporting of accruals. *Auditing: A Journal of Practice & Theory, 18*, 2. 17-34.

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

Gao, X., & Ritter, J. (2010). The marketing of seasoned equity offerings. *Journal of Financial Economics, 97*, 33–52.

Geiger, M. A., & Raghunandan, K. (2002). Auditor tenure and audit reporting failures. *Auditing: A Journal of Practice & Theory, 21*(1), 67–78.

Ghosh, A., & Moon, D. (2005). Auditor tenure and perceptions of audit quality. *The Accounting Review, 80*, 585–612.

Gompers, P., Ishii, J., & Metrick, A. (2003). Corporate governance and equity prices. *Quarterly Journal of Economics, 118*, 107–155.

Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics, 60*(2–3), 187–243.
Gul, A. F., Fung, S., & Jaggi, B. (2009). Earnings quality: Some evidence on the role of auditor tenure and auditors' industry expertise. *Journal of Accounting and Economics, 47*, 265–287.
Gul, A. F., Jaggi, B., & Krishnan, G. (2007). Auditor independence: Evidence on the joint effects of auditor tenure and non-audit fees. *Auditing: A Journal of Practice & Theory, 26*(2), 117–142.
Habib, M. A., & Ljungqvist, A. P. (2001). Underpricing and entrepreneurial wealth losses in IPOS: Theory and evidence. *Review of Financial Studies, 14*, 433–458.
Hansen, R. S., & Crutchley, C. (1990). Corporate earnings and financings: An empirical analysis. *Journal of Business, 63*, 347–371.
Heckman, J. J., Ichimura, H., & Todd, P. E. (1997). Matching as an econometric evaluation estimator: Evidence from evaluating a job training Programme. *Review of Economic Studies, 64*, 605–654.
Heron, R. A., & Lie, E. (2004). A comparison of the motivations for and the information content of different types of equity offerings. *Journal of Business, 77*, 605–632.
Hertzel, M., Lemmon, M., Linck, J. S., & Rees, R. R. (2002). Long run performance following private placements of equity. *Journal of Finance, 57*(6), 2595–2617.
Hertzel, M., & Zhi, L. (2010). Behavioral and rational explanations of stock price performance around SEOs: Evidence from a decomposition of market to book ratios. *Journal of Financial and Quantitative Analysis, 45*(935), 958.
Hogan, C. E. (1997). Costs and benefits of audit quality in the IPO market: A self-selection analysis. *The Accounting Review, 1*, 67–86.
Hope, O.-K. (2003). Disclosure practices, enforcement of accounting standards, and analysts' forecast accuracy: An international study. *Journal of Accounting Research, 41*, 235–272.
Hope, O. K., & Langli, J. C. (2010). Auditor independence in a private firm and low litigation risk setting. *The Accounting Review, 85*, 573–605.
Huson, M. R., & MacKinnon, G. (2003). Corporate spinoffs and information asymmetry between investors. *Journal of Corporate Finance, 9*(4), 481–503.
Ibbotson, R. G. (1975). Price performance of common stock new issues. *Journal of Financial Economics, 2*, 235–272.
Jegadeesh, N. (2000). Long-run performance of seasoned equity offerings: Benchmark errors and biases in expectations. *Financial Management, 29*, 5–30.
Jensen, M., & Meckling, W. (1976). Theory of the firm managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*, 305–360.
Jha, A., & Chen, Y. (2015). Audit fees and social capital. *The Accounting Review, 90*, 611–639.
Johnson, V. E., Khurana, I. K., & Reynold, J. K. (2002). Audit-firm tenure and the quality of financial reports. *Contemporary Accounting Research, 19*(4), 637–660.
Jung, K., Kim, Y., & Stulz, R. (1996). Timing, investment opportunities, managerial discretion, and the security issue decision. *Journal of Financial Economics, 42*, 159–185.
Khurana, I. K., & Raman, K. K. (2004). Litigation risk and the financial reporting credibility of big 4 versus non-big 4 audits: Evidence from Anglo-American countries. *The Accounting Review, 79*, 473–495.
Knechel, W. R., Krishnan, G., Pevzner, M., Shefchik, L., & Velury, U. (2013). Audit quality: Insights from the academic literature. *Auditing: A Journal of Practice & Theory, 32*, 385–421.
Knechel, W. R., Naiker, V., & Pacheco, G. (2007). Does audit industry specialization matter? Evidence from market reaction to auditor switches. *Auditing: A Journal of Practice & Theory, 26*(1), 19–45.
Koerniadi, H., Krishnamurti, C., Lau, S. T., Tourani-Rad, A., & Yang, T. (2015). The role of internal and external certification mechanisms in seasoned equity offerings. *Journal of Multinational Financial Management, 30*, 110–127.
Kothari, S. P., Li, X., & Short, J. E. (2009). The effect of disclosures by management, analysts, and business press on cost of capital, return volatility, and analyst forecasts: A study using content analysis. *The Accounting Review, 84*, 1639–1670.
Krishnan, G. V. (2003). Audit quality and the pricing of discretionary accruals. *Auditing: A Journal of Practice & Theory, 22*(1), 109–126.
Krishnan, J. (2005). Audit committee quality and internal control: An empirical analysis. *The Accounting Review, 80*, 649–675.
Krishnan, J., & Krishnan, J. (1997). Litigation risk and auditor resignations. *The Accounting Review, 72*, 539–560.
Lang, M., & Lundholm, R. (1996). Corporate disclosure policy and analyst behaviour. *The Accounting Review, 71*, 467–492.
Langendijk, H. (1997). The market for audit services in the Netherlands. *The European Accounting Review, 6*, 253–264.
Lawrence, A., Minutti-Meza, M., & Zhang, P. (2011). Can Big 4 versus Non-Big 4 differences in audit-quality proxies be attributed to client characteristics? *The Accounting Review, 86*(1), 259–286.
Lee, C. C., Poon, W. C., & Sinnakkannu, J. (2018). Selection bias and the underwriter certification of the largest shareholders in seasoned equity offerings. *International Review of Finance, 18*(2), 217–251.
Lennox, C. S., Francis, J. R., & Wang, Z. (2012). Selection models in accounting research. *The Accounting Review, 87*, 589–616.
Leuz, C., Nanda, D., & Wysocki, P. D. (2003). Earnings management and investor protection: An international comparison. *Journal of Financial Economics, 69*(3), 505–527.
Li, D., Moshirian, F., Pham, P., & Zein, Z. (2006). When financial institutions are large shareholders: The role of macro corporate governance environments. *Journal of Finance, 61*(6), 2975–3007.
Li, X., & Zhao, X. (2006). Propensity score matching and abnormal performance after seasoned equity offerings. *Journal of Empirical Finance, 13*(3), 351–370.
Lim, C., & Tan, H. (2008). Non-audit service fees and audit quality: The impact of auditor specialization. *Journal of Accounting Research, 46*(1), 199–246.
Loughran, T., & Ritter, J. (1995). The new issues puzzle. *Journal of Finance, 50*, 23–51.
Loughran, T., & Ritter, J. (1997). The operating performance of firms conducing seasoned equity offerings. *Journal of Finance, 52*, 1823–1850.
Loughran, T., & Ritter, J. (2000). Uniformly least powerful tests of market efficiency. *Journal of Financial Economics, 55*, 361–389.
Low, K. Y. (2004). The effects of industry specialization on audit risk assessments and audit-planning decisions. *The Accounting Review, 79*, 201–219.
Lyandres, E., Fu, F., & Li, E. X. N. (2016). Do underwriters compete in IPO pricing? *Management Science, 64*, 925–954.
Mande, V., Park, Y. K., & Son, M. (2012). Equity or debt financing: Does good corporate governance matter? *Corporate Governance: An International Review, 20*(2), 95–211.
Mansi, S. A., Maxwell, W. F., & Miller, D. P. (2004). Does auditor quality and tenure matter to investors? Evidence from the bond market. *Journal of Accounting Research, 42*, 755–793.
McLaughlin, R., Safieddine, A., & Vasudevan, G. (1996). The operating performance of seasoned equity issuers: Free cash flow and post-issue performance. *Financial Management, 25*, 41–53.
Melia, A., Chan, H., Docherty, P., & Easton, S. (2018). Explanations of cycles in seasoned equity offerings: An examination of the choice between rights issues and private placements. *Pacific-Basin Finance Journal, 50*, 16–25.
Miller, M. H., & Rock, K. (1985). Dividend policy under asymmetric information. *Journal of Finance, 40*, 1031–1051.
Myers, J. N., Myers, L. A., & Omer, T. C. (2003). Exploring the term of the auditor-client relationship and quality of earnings: A case for mandatory auditor rotation? *The Accounting Review, 78*(3), 779–799.
Myers, S. C. (1984). The capital structure puzzle. *Journal of Finance, 39*, 574–592.
Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics, 13*, 187–221.
Ng, L., Wu, F., Yu, J., & Zhang, B. (2016). Foreign investor heterogeneity and stock liquidity around the world. *Review of Finance, 20*(5), 1867–1910.
Ngatuni, P., Capstaff, J., & Marshall, A. (2007). Long-term performance following rights issues and open offers in the UK. *Journal of Business Finance & Accounting, 34*, 33–64.
Niemi, L. (2005). Audit effort and fees under concentrated client ownership: Evidence from four international audit firms. *The International Journal of Accounting, 40*(4), 303–323.
Pandes, J. A. (2010). Bought deals: The value of underwriter certification in seasoned equity offerings. *Journal of Banking and Finance, 34*(7), 1576–1589.
Pastor, L., & Stambaugh, R. F. (2003). Liquidity risk and expected stock returns. *Journal of Political Economy, 111*, 642–685.
Peress, J. (2014). The media and the diffusion of information in financial markets: Evidence from newspaper strikes. *Journal of Finance, 69*, 2007–2043.
Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *Review of Financial Studies, 22*, 435–480.
Peyer, U., & Vermaelen, T. (2008). The nature and persistence of buyback anomalies. *Review of Financial Studies, 22*, 1693–1745.
Pittman, J. A., & Fortin, S. (2004). Auditor choice and the cost of debt capital for newly public firms. *Journal of Accounting and Economics, 37*, 113–136.
Rangan, S. (1998). Earnings management and the performance of seasoned equity offerings. *Journal of Financial Economics, 50*, 101–122.
Rauterkus, S. Y., & Song, K. R. (2005). Auditor's reputation and equity offerings: The case of Arthur Andersen. *Financial Management, 34*(4), 121–135.
Reynolds, J. K., & Francis, J. R. (2001). Does size matter? The influence of large clients on office-level audit or reporting decisions. *Journal of Accounting and Economics, 20*, 375–400.
Ritter, J. (2003). Investment banking and securities issuance. In G. Constantinides, M. Harris, & R. Stulz (Eds.), *Handbook of the economics of finance (chapter 5)* (pp. 255–306). North Holland: Elsevier.
Rutledge, R. W., Karim, K. E., & Luo, X. (2014). The effects of SOX on firms audited by Big-4 versus Non-Big-4 audit firms. *Journal of Accounting and Finance, 14*, 86–102.
Sandra, W. M. H., & Patrick, P. H. N. (1996). The determinants of audit fees in Hong Kong: An empirical study. *Asian Review of Accounting, 4*, 32–50.
Schroth, E. J. (2006). Innovation, differentiation, and the choice of an underwriter: Evidence from equity-linked securities. *Review of Financial Studies, 19*(3), 1041–1080.
Seetharaman, A., Gul, F. A., & Lynn, S. G. (2002). Litigation risk and audit fees: Evidence from UK firms cross-listed on US markets. *Journal of Accounting and Economics, 33*, 91–115.
Shivakumar, L. (2000). Do firms mislead investors by overstating earnings before seasoned equity offerings? *Journal of Accounting and Economics, 29*, 339–371.
Simunic, D. A. (1980). The pricing of audit services: Theory and evidence. *Journal of Accounting Research, 18*, 161–190.
Skinner, D., & Srinivasan, S. (2012). Audit quality and auditor reputation: Evidence from Japan. *The Accounting Review, 87*(5), 1737–1765.
Solomon, I., Shields, M., & Whittington, O. (1999). What do industry-specialist auditors know? *Journal of Accounting Research, 37*(1), 191–208.
Spiess, D. K., & Affleck-Graves, J. (1995). Underperformance in long-run stock returns following seasoned equity offerings. *Journal of Financial Economics, 38*(3), 243–267.
Srinidhi, B., He, S., & Firth, M. (2014). The effect of governance on specialist auditor choice and audit fees in U.S. family firms. *The Accounting Review, 89*(6), 2297–2329.
Stanley, J. D. (2011). Is the audit fee disclosure a leading indicator of clients' business risk? *Auditing: A Journal of Practice & Theory, 30, 3*, 157–179.

Stice, J. D. (1991). Using financial and market information to identify pre-engagement factors associated with lawsuits against auditors. *The Accounting Review, 66*, 516–533.
Taylor, M. E., & Baker, R. L. (1981). An analysis of the external audit fee. *Accounting and Business Research, 12*, 55–60.
Teoh, S. H., Welch, I., & Wong, T. J. (1998). Earnings management and the underperformance of seasoned equity offerings. *Journal of Financial Economics, 50*, 63–99.
Teoh, S. H., & Wong, T. J. (1993). Perceived auditor quality and the earnings response coefficient. *The Accounting Review, 68*, 346–366.
Tetlock, P. C. (2010). Does public financial news resolve asymmetric information? *Review of Financial Studies, 23*, 3520–3557.
Titman, S., & Trueman, B. (1986). Information quality and the valuation of new issues. *Journal of Accounting and Economics, 8*, 159–172.
Tucker, J. W. (2010). Selection bias and econometric remedies in accounting and finance research. *Journal of Accounting Literature, 29*, 31–57.
Whisenant, S., Sankaraguruswamy, S., & Raghunandan, K. (2003). Evidence on the joint determination of audit and non-audit fees. *Journal of Accounting Research, 41*, 721–744.
Willenborg, M. (1999). Empirical analysis of the economic demand for auditing in the initial public offerings market. *Journal of Accounting Research, 37*, 225–238.
Yu, F. (2008). Analyst coverage and earnings management. *Journal of Financial Economics, 88*(2), 245–271.
Zang, A. (2012). Evidence on the trade-off between real activities manipulation and accrual-based earnings management. *The Accounting Review, 87*(2), 675–703.
Zhou, J., & Elder, R. (2004). Audit quality and earnings management by seasoned equity offering firms. *Asia-Pacific Journal of Accounting & Economics, 11*, 95–120.