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Do Big 4 Auditors Provide Higher Audit Service Quality Than Second-Tier Auditors in Small and Mid-Sized Initial Public Offerings?

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To the Graduate Council:

I am submitting herewith a dissertation written by Stefan K. Slavov entitled "Do Big 4 Auditors Provide Higher Audit Service Quality Than Second-Tier Auditors in Small and Mid-Sized Initial Public Offerings?." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Business Administration.

Linda A. Myers, Major Professor

We have read this dissertation and recommend its acceptance:

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Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

**Do Big 4 Auditors Provide Higher Audit Service Quality Than Second-Tier
Auditors in Small and Mid-Sized Initial Public Offerings?**

A Dissertation Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Stefan K. Slavov
May 2022

DEDICATIONS

I dedicate this dissertation to my parents, Krassimir Slavov and Svetla Slavova, and to my sister, Dessi Slavova. I would not have completed this degree without your support and unconditional love.

I also dedicate this dissertation to my grandmothers, Zaika Slavova and Stefka Staneva, and to my late grandfathers, Dimitar Slavov and Stefan Stanev. Your work ethic and commitment to family continue to inspire me in my pursuits. Your love was unwavering, even when we were thousands of miles apart.

This work is also dedicated to my girlfriend, Kate Murphy. Thank you for always believing in me and for being by my side through this journey. The best is yet to come.

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ABSTRACT

Big 4 auditors perform most audits of companies that issue initial public offerings (IPOs). Regulators have expressed interest in increasing IPO audit market competition and a growing body of evidence suggests that Second-Tier auditors could provide IPO audit service quality comparable to that of Big 4 auditors. However, there exists limited empirical evidence on whether IPO audit service quality varies with auditor type. I investigate whether IPO audit service quality differs between Big 4 and Second-Tier auditors for a sample of small and mid-sized IPOs from 2005 through 2019. I find that Big 4 clients are associated with lower pre-IPO discretionary accruals, suggesting that Big 4 auditors are better able to constrain the opportunistic financial reporting decisions of management. I also examine whether the extent of accounting comments in Securities and Exchange Commission (SEC) comment letters on the registration statement varies by auditor type. I find that Big 4 clients receive fewer initial accounting comments and that they more effectively address these comments, suggesting that Big 4 auditors are better able to advise clients on achieving compliance with SEC reporting standards. Collectively, my findings suggest that Big 4 auditors provide higher IPO audit service quality than Second-Tier auditors. However, I find that Big 4 clients are not less likely to be sued in IPO-related litigation and that they pay a considerable audit fee premium relative to Second-Tier clients. These findings should be of interest to those who influence IPO auditor selection and must consider the viability of Second-Tier auditors as an alternative to the Big 4. In addition, my findings should be informative to regulators concerned that the lack of audit market competition may not provide sufficient incentives for Big 4 auditors to deliver high quality audits.

TABLE OF CONTENTS

| | |
|--|----|
| SECTION I. INTRODUCTION | 1 |
| SECTION II. BACKGROUND AND HYPOTHESIS DEVELOPMENT | 9 |
| Prior Research on Auditors and IPOs | 9 |
| IPO Audit Service Quality | 11 |
| IPO Audit Service Quality and the Use of a Big 4 Auditor | 13 |
| SECTION III. RESEARCH DESIGN | 16 |
| Tests of Pre-IPO Discretionary Accruals..... | 16 |
| Tests of SEC Accounting Comment Letters | 19 |
| SECTION IV. SAMPLE AND DESCRIPTIVE STATISTICS | 21 |
| SECTION V. EMPIRICAL RESULTS | 24 |
| The Association Between Pre-IPO Discretionary Accruals and Big 4 Auditors..... | 24 |
| The Association between SEC Accounting Comments and Big 4 Auditors | 25 |
| Additional Analyses and Robustness Tests | 26 |
| Topics in Initial SEC Accounting Comments..... | 26 |
| Robustness to Entropy Balancing | 27 |
| Litigation Risk and Litigation Outcomes..... | 29 |
| Audit Fees | 33 |
| SECTION VI. CONCLUSION..... | 36 |
| REFERENCES | 38 |
| APPENDICES | 44 |
| VITA..... | 63 |

LIST OF TABLES

| | |
|---|----|
| TABLE 1 Sample Selection and Composition. | 50 |
| TABLE 2 Descriptive Statistics..... | 52 |
| TABLE 3 Pre-IPO Discretionary Accruals and the Use of a Big 4 Auditor. | 54 |
| TABLE 4 SEC Accounting Comments and the Use of a Big 4 Auditor | 55 |
| TABLE 5 Accounting Topics in Initial SEC Comment Letters. | 56 |
| TABLE 6 Entropy Balancing..... | 58 |
| TABLE 7 Litigation Risk and Litigation Outcomes..... | 59 |
| TABLE 8 IPO Audit Fees and the Use of a Big 4 Auditor..... | 62 |

SECTION I. INTRODUCTION

Regulators are interested in promoting competition for initial public offering (IPO) audits because it could increase audit quality and reduce audit costs. For example, in a 2008 report, the Advisory Committee on the Auditing Profession (ACAP) concluded that non-Big 4 auditors were being unfairly restricted from engaging IPO clients by third parties (e.g., underwriters, lenders, credit rating agencies), recommending that the SEC require companies to disclose in their registration statements any agreements that limit auditor choice (e.g., underwriting agreements) (ACAP 2008). In addition, in 2020, the Securities and Exchange Commission (SEC) adopted amendments to independence requirements for IPO auditors, contending that such changes should “expand the pool of eligible auditors for domestic first-time filers... reduce audit fees... and positively influence audit quality” (SEC 2020). These efforts indicate that non-Big 4 auditors could be a viable alternative to Big 4 auditors in IPOs. However, empirical evidence on whether IPO audit service quality varies with auditor type is limited. In this study, I examine whether Big 4 auditors provide higher quality IPO audit services than Second-Tier auditors.¹

I focus my investigation on small and mid-sized IPOs, or companies with less than \$1 billion in pre-IPO year revenues (GAO 2003; SEC 2018). Second-Tier auditors compete with Big 4 auditors for small and mid-sized IPOs, but not for large IPOs.² Second-Tier auditors claim that their services are desirable because they possess the necessary resources, skills, and

¹ Second-Tier auditors include non-Big 4 auditors that are annually inspected by the Public Company Accounting Oversight Board (PCAOB) because they perform more than 100 audits of public companies each year (GAO 2008; DeFond et al. 2017; Moon et al. 2019). The Second-Tier auditors with IPOs in my study include BDO, Grant Thornton, Marcum (since 2014), and RSM (McGladrey before 2015). I use PCAOB inspection reports to determine whether a non-Big 4 auditor is annually inspected in the year when their client went public. Information on PCAOB inspection reports is available at: <https://pcaobus.org/oversight/inspections/firm-inspection-reports>.

² During my sample, the Big 4 audit over 80% of small and mid-sized IPOs but nearly 100% of large IPOs. A 2003 report by the Government Accountability Office characterizes the public company audit market as having a dual market structure where Big 4 auditors compete with non-Big 4 auditors for small and mid-sized company audits, but only the Big 4 compete for large public company audits (GAO 2003).

experience for high audit quality, because they are subject to annual Public Company Accounting Oversight Board (PCAOB) inspections, and because their staffing structure allows for more partner and manager interaction with the client at a lower cost than Big 4 competitors (BDO 2007; GT 2016; Daoust et al. 2021). Because IPO client size is correlated with factors that influence auditor-client alignment and IPO audit quality (e.g., offering size, complexity, geographic reach, etc.), excluding large IPOs allows me to construct a sample of relatively similar clients that are auditable by both auditor types (i.e., Big 4 and Second-Tier auditors).³

Small and mid-sized IPOs reflect an economically meaningful segment of the IPO market.⁴ Companies making their first public equity offer face significant information asymmetries and investors rely on financial information in the registration statement to develop expectations of company value (Brau and Fawcett 2006). Auditors enhance the credibility of this information through independent assurance over the financial statements and by issuing a comfort letter which aids the underwriter in their due diligence over information in the registration statement derived from the company's accounting records (STB 2016; GT 2018; PwC 2021). Therefore, given the importance of financial information in investor decisions and the equity capital raised by small and mid-sized IPO companies, it is important to understand whether IPO audit quality is associated with auditor type.

³ I do not examine whether IPO audit service quality varies between Big 4 and smaller non-Big 4 auditors (i.e., triennially inspected auditors) because prior research suggests that smaller non-Big 4 auditors provide lower IPO audit quality relative to both Big 4 and Second-Tier auditors (Weber and Willenborg 2003; Albring et al. 2007). In addition, prior research documents that the client characteristics of smaller non-Big 4 and Big 4 auditors have little overlap (Khurana et al. 2021). Similarly, I find little overlap between the characteristics of Big 4 or Second-Tier IPO clients and smaller non-Big 4 IPO clients (untabulated).

⁴ Total IPO proceeds for the small and mid-sized companies in my sample (N = 788) are \$107.5 billion with average offering size of \$136.4 million. Using similar sample restrictions, total IPO proceeds for large companies (N = 88; not included in my sample) are \$65.8 billion, with average offering size of \$748.8 million. IPO proceeds are calculated as the total number of shares issued in the IPO multiplied by the IPO offer price. IPO proceeds indicate an amount of potential investor loss and, relatedly, reflect the upper limit on damages from IPO-related lawsuits (Venkataraman et al. 2008).

There are at least two other important reasons to investigate this question. First, while the audit committee is charged with overseeing the selection and appointment of the auditor for public companies, management is typically responsible for auditor selection in private companies preparing to IPO (Esplin et al. 2018). An IPO represents the first time that a company's auditor is revealed to the public, elevating the importance of auditor selection, but many managers have not been previously involved in selecting an IPO auditor. Moreover, evidence suggests that underwriters and other parties involved in the IPO can influence the selection process (ACAP 2008). They may perceive the Big 4 brand as being associated with higher IPO audit service quality (Reilly 2006; GAO 2003; GAO 2008; Gray and Ratzinger 2010; Daoust et al. 2021), but empirical evidence on actual differences in such quality is limited. Second, auditors have strong incentives to win IPO company audits because they offer high margins, the promise of a continued relationship with the IPO company as it grows, and visibility to the IPO client that could improve the associated auditor's image (Stuart 2008). If IPO audit service quality does not differ across auditor type, the perception that Big 4 auditors provide higher quality IPO audit services could be reinforcing a status quo that is limiting the extent of competition in the market for audits of small and mid-sized IPOs.

Theory suggests that, due to their size, Big 4 auditors could be associated with higher IPO audit service quality because of the auditors' higher competence, larger resources, and greater reputational and litigation incentives (DeAngelo 1981; Dopuch and Simunic 1982; Palmrose 1988). However, recent evidence suggests that audit quality between Big 4 and Second-Tier auditors is comparable among already-public companies following the regulatory and audit market changes of the early 2000s – such as the passage of the Sarbanes-Oxley Act of 2002 (SOX) (SOX 2002), the PCAOB's program of annual audit firm quality inspections, the

demise of Arthur Andersen, and the rapid subsequent growth of Second-Tier auditors (Boone et al. 2010; DeFond et al. 2017). Daoust et al. (2021) interview audit partners to learn about organizational climates of non-Big 4 accounting firms and a non-Big 4 partner with Big 4 experience casts doubt on the notion of quality differences in the post-SOX era stating “(the difference in quality) is just perception... Some people want to believe that they get what they pay for. Because they pay more to the Big 4, they would like to believe they get a higher quality product.”

Several characteristics of the IPO audit setting further suggest that it is unclear whether IPO audit service quality varies across auditor type. First, IPO auditors should have strong litigation incentives because they are subject to significant litigation exposure under the Securities Act of 1933 (Venkataraman et al. 2008).⁵ Second, many parties are involved in the IPO process and in the preparation and review of the registration statement (e.g., underwriters, accounting advisors, legal counsel, consultants). These parties should provide a “floor” to the quality of an IPO company’s financial reporting and disclosure through their monitoring and advising activities, reducing the opportunity for external auditors to require adjustments related to transactions, account balances, and disclosures (DeFond and Zhang 2014). Third, the IPO audit requires a deep understanding of PCAOB standards and SEC registration statement requirements. The Big 4 have historically audited more IPOs, but Second-Tier firms have robust IPO advisory practices and are annually inspected by the PCAOB, suggesting they may have the requisite knowledge for high IPO audit service quality.

⁵ IPO auditors are subject to Section 11 of the Securities Act of 1933, which provides investors the right to sue issuers, their directors and officers, underwriters, and accountants for declines in security value below the offer price due to omissions of material facts in the prospectus (Hanley and Hoberg 2012). Section 11 does not require the plaintiff to establish that the defendant had an intent to injure or knowledge of the misrepresentation, but this is required for claims against already-public companies under the Securities and Exchange Act of 1934 (DLA Piper 2017).

I examine whether two dimensions of IPO audit service quality vary with auditor type. First, I examine discretionary accruals in the pre-IPO year because they reflect the quality of the financial reporting decisions made by management and allowed by the auditor (Venkataraman et al. 2008; Ball and Shivakumar 2008). Second, I investigate the number of initial, as well as subsequent, accounting comments in SEC comment letters on the registration statement. Auditors advise clients on achieving compliance with SEC standards; therefore, the presence of more accounting comments suggests a higher number of accounting treatment and disclosure concerns by the SEC, reflecting lower IPO audit service quality.

I construct a sample of small and mid-sized IPOs on major U.S. exchanges from 2005 through 2019. I find that important characteristics of the offering that should influence the demand for audit quality, including offering size and the percent of the company sold in the offering (Leland and Pyle 1977; Willenborg 1999), are similar across auditor type. IPO clients also have similar assets, revenues, and revenue growth across auditor type. However, IPO companies with Big 4 auditors are younger, less leveraged, have higher litigation risk, are more complex, have more foreign operations, and are more likely to use a prestigious underwriter and receive venture capital investment. Still, there is considerable overlap in these characteristics across auditor type. In my regressions, I control for these and other factors that could influence IPO audit service quality and the use of a Big 4 auditor.

I find that Big 4 IPO clients are associated with lower absolute and signed discretionary accruals, suggesting that Big 4 auditors are more conservative in their audit procedures. I also find that Big 4 IPO clients receive fewer initial SEC accounting comments, suggesting that Big 4 auditors better advise clients on their draft registration statements. Initial accounting comments are positively associated with accounting comments in subsequent rounds, but this association is

weaker for Big 4 IPO clients, suggesting that Big 4 auditors help clients address issues initially identified by the SEC more effectively. My inferences remain unchanged when I use entropy-balancing to achieve covariate balance between Big 4 and Second-Tier IPOs.⁶

I also examine the types of accounting issues identified in initial SEC comment letters. Using the accounting issue framework described in Cassell et al. (2013b), I find that Big 4 clients have fewer issues related to Non-Core Earnings (i.e., one-time items and non-operating activities), but not related to other issue categories including Core Earnings (i.e., operating activities), Classification, and Fair Value. This finding supports the notion that Big 4 auditors have deep knowledge on a broad range of accounting issues that allows them to differentiate the quality of their IPO audit services from that of Second-Tier auditors.

Prior research suggests that Big 4 auditors may be preferred in IPOs because they could reduce the risk of litigation against the IPO company or underwriter and because their “deep pockets” allow for greater recovery in the event of litigation (i.e., an insurance role) (Menon and Williams 1991; Willenborg 1999). Higher quality auditors should be better able to reduce material omissions or untruths in the registration statement, a necessary condition for IPO-related litigation. However, I find no significant association between the filing of IPO-related litigation and auditor type, even after controlling for ex-ante litigation risk. In addition, most cases are settled and the average settlement amount is modest, at roughly 5 percent of IPO proceeds, suggesting that Second-Tier auditors should be able to provide sufficient coverage in the case of

⁶ Entropy balancing ensures covariate balance on observables across auditor type by assigning weights to observations such that those more likely to have received treatment (i.e., to have engaged a Big 4 auditor) are assigned greater weights (Hainmueller 2012). I cannot rule out the possibility that unobservable client characteristics associated with auditor-client alignment and audit quality are contributing to my results, an issue common to research on auditor type and auditor quality. I discuss how I have addressed this possibility in Section 5.

litigation. Therefore, it does not appear that Big 4 auditors should be preferred because they can more effectively play an insurance role for small and mid-sized IPOs.

Collectively, my results suggest that Big 4 auditors provide higher IPO audit service quality than Second-Tier auditors. Prior research suggests that, in addition to their insurance role, Big 4 auditors could be preferred in IPOs because they play a more effective information signaling role (Menon and Williams 1991). Specifically, they are perceived to better enhance the credibility of financial information, allowing companies to better signal their value and reducing the costs faced by underwriters and investors when gathering information about the company. My audit quality findings are consistent with the information signaling role to the extent that such *perceived* differences could be grounded in the higher *actual* quality of Big 4 IPO audit services. However, I leave this investigation to future research.

The decision to use a Big 4, rather than a Second-Tier auditor, is also influenced by cost considerations (Hogan 1997). I examine differences in audit fees between Big 4 and Second-Tier IPO auditors. I find that in the pre-IPO (IPO year), after controlling for other factors that determine audit fees, Big 4 clients pay 45.2 (65.9) percent higher fees than Second-Tier clients, equivalent to approximately \$0.34 million (\$0.80 million) higher audit fees for a representative IPO in my sample.

Regulators interested in promoting IPO audit market competition can do so by bringing attention to the potential costs and benefits of using Second-Tier auditors as an alternative to the Big 4. The relatively higher audit quality of Big 4 auditors suggests that they have sufficient incentives for higher audit quality than their competitors, despite their dominant position in the market. However, I reiterate calls for disclosure in the registration statement of agreements with third parties that restrict IPO auditor choice (O'Malley 2008; GT 2008; ACAP 2008). Such

parties are unlikely to be sensitive to the implications of IPO auditor choice (e.g., higher fees) given the transitory nature of their involvement with the IPO company.

My study contributes to the limited literature on IPO audit quality (e.g., Weber and Willenborg 2003) by documenting that Big 4 auditors provide higher IPO audit service quality than Second-Tier auditors. I also contribute to the literature on earnings management around IPOs by documenting that Big 4 auditors are more conservative in their audit of the pre-IPO financial statements (e.g., Teoh et al. 1998; Ball and Shivakumar 2008; Venkataraman et al. 2008). I contribute to research on the determinants of SEC registration statement comment letters in IPOs (e.g., Li and Liu 2017; Lowry et al. 2020). I also contribute to the extensive body of research that examines the relation between auditor type and audit quality among already-public companies (Lennox and Pittman 2010; Boone et al. 2010; Lawrence et al. 2011; Bills et al. 2016; DeFond et al. 2017; Jiang et al. 2019).

The remainder of the paper is organized as follows. Section II provides background and develops my empirical predictions. In Sections III and IV, I describe my research design and sample. Section V presents the empirical results, along with the results from additional analyses. Section VI offers concluding remarks.

SECTION II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

Prior Research on Auditors and IPOs

Going public allows a company to raise equity capital, boost its profile, and create a market for its shares, which permits founders and other shareholders to convert some of their wealth into cash (Ritter and Welch 2002). Going public is a time-consuming and costly process. Companies are encouraged to allow two to three years to prepare for being a public company (RSM 2021). Preparation involves changes to financial reporting processes, internal control, corporate structure, and governance intended to ensure accurate and timely reporting and compliance with public company rules set by the SEC and U.S. stock exchanges (STB 2016). Preparation also involves choosing the company's IPO working group, which typically consists of management, external auditors, accounting advisors, underwriters, lawyers, and owners of the company.

Companies making their first public equity offer are subject to significant information asymmetries between issuers and investors (Chaplinsky et al. 2017). Managers, who often also share in company ownership, have incentives to manipulate this information to increase IPO proceeds and the value of their equity holdings (Friedlan 1994; DuCharme et al. 2001). The SEC requires that the Form S-1 registration statement be the primary source of information during the IPO process to protect investors and maintain efficient capital markets (Bushee et al. 2020).

IPO auditors play a critical role in this process. They provide assurance on the financial statements in the registration statement, advise clients on achieving initial compliance with SEC reporting requirements, and facilitate the SEC registration statement review process by aiding clients with their responses to SEC comment letters issued as part of the SEC's required review of every registration statement (STB 2016). IPO auditors also aid the underwriter in their

financial due diligence by issuing a comfort letter over information in the registration statement derived from the company's accounting records. A comfort letter assures that information in the registration statement is correctly prepared and that no material changes have occurred since its preparation.⁷

Prior research suggests that IPO audit service quality is desirable for at least two reasons. First, it should improve the credibility of the company's financial information through greater assurance that it faithfully reflects the underlying economics of the company. This allows companies to better signal their value and reduces the costs faced by underwriters and investors gathering information about the company (i.e., an information signaling role) (Menon and Williams 1991). Second, it should reduce the risk of litigation resulting from low-quality financial reporting and omissions or untruths in the registration statement and deep pocketed auditors should allow for greater recovery in the event of litigation (i.e., an insurance role) (Beatty 1989; Willenborg 1999).

Menon and Williams (1991) find that most companies changing auditors before an IPO switch to a Big 4 auditor, indicating that they are perceived to provide higher quality IPO audit services, although only about 4 percent of all IPO companies make such a change.⁸ Simunic and Stein (1987) find that companies engaging a Big 4 auditor obtain a higher market premium over book value subsequent to the issue. Beatty (1989) finds that clients using a Big 4 auditor are associated with lower IPO underpricing, a measure of the wealth transferred from existing owners to new investors, suggesting less uncertainty about the value of the IPO.

⁷ The auditor typically provides one comfort letter at the time the underwriting agreement is signed and another at the IPO closing date (an updated or "bring down letter") (STB 2016).

⁸ For ease of exposition, I use the term "Big 4" here and throughout the paper when discussing research examining the largest auditing firms. The largest auditing firms were previously the Big 8, the Big 6, or the Big 5.

Although prior research suggests that Big 4 auditors are *perceived* to provide higher IPO audit service quality, the research on *actual* differences in IPO audit service quality between Big 4 and Second-Tier auditors is limited. To my knowledge, Weber and Willenborg (2003) is the only such study. Using a sample of microcap IPOs on U.S. exchanges (those that raise less than \$10 million) from 1993 through 1994, the authors find no difference between Big 4 and Second-Tier auditors in the extent to which going-concern opinions provide information about future delistings and stock returns. However, it is unclear whether these inferences generalize to small and mid-sized IPOs.⁹

IPO Audit Service Quality

The primary role of the IPO auditor is to issue an opinion on the financial statements included in the registration statement. The auditor applies PCAOB auditing procedures to ensure that the financial information reported is consistent with GAAP and fairly reflects the underlying economics of the company. Prior research examines earnings quality around IPOs and suggests that the monitoring of auditors should influence the pre-IPO financial reporting decisions of management (Ball and Shivakumar 2008; Venkataraman et al. 2008).¹⁰

In addition, IPO auditors advise clients on achieving compliance with SEC reporting standards. The auditor provides feedback to the company on the draft registration statement before it is initially submitted to the SEC, including technical accounting advice, guidance on drafting the financial statements and other disclosures in the prospectus, and review of the registration statement to ensure the accuracy, completeness, and consistency of included

⁹ The average company in my sample has IPO proceeds of \$136 million.

¹⁰ Early research documents that managers of IPO companies inflate pre-IPO earnings to maximize the IPO process (Teoh et al. 1998). However, Ball and Shivakumar (2008) find that this is not the case, suggesting that managers of IPO companies are limited in their ability to manage earnings in the pre-IPO period because of the high litigation and regulatory risk from inflating earnings, and higher-than-usual scrutiny by market monitors such as analysts, underwriters, auditors, boards, the press, and other parties to the transaction.

financial information and disclosures (STB 2016).¹¹ Upon completing its initial review, the SEC provides the company with comments on items that should be clarified or revised. Management and company counsel usually draft the company's response to each comment, along with an amended registration statement. The auditors review the responses and provide feedback, particularly for matters related to the financial statements and associated financial information (GT 2018). The company then files a written response and amended registration statement to the SEC and the review process repeats until the SEC is satisfied. Once the registration statement is deemed effective, the company is allowed to issue its equities on public stock exchanges.

Companies have incentives to minimize the extent of SEC comments during this process because they are a distraction from normal operations and because the information in the registration statement can "go stale," requiring the inclusion of additional quarterly or annual financial statements in the registration statement. Li and Liu (2017) find that IPO companies with more SEC comment letters experience greater downward price revisions in the IPO offer price from the initial registration statement filing date to the IPO issue date (i.e., the registration period). Lowry et al. (2020) find that comments related to revenue recognition in the first SEC comment letter are associated with greater downward price revisions and that more SEC comment letters are associated with a greater reduction in the number of shares the company intends to issue during the registration period. Higher quality IPO audit services should help companies minimize the extent of initial comments raised by the SEC and reduce the extent to which initial comments persist in the form of subsequent accounting comments.

¹¹ External auditors must be independent and cannot be directly involved in the preparation of the financial statements and other parts of the registration statement. Prior to the SOX prohibition of certain non-audit services (ReedSmith 2003), external auditors were allowed to provide a wider range of services for IPO clients.

IPO Audit Service Quality and the Use of a Big 4 Auditor

The question of whether Big 4 auditors provide higher audit quality has been extensively researched among already-public companies. Theory suggests that Big 4 auditors should provide higher audit quality because they have greater reputational concerns and more independence than non-Big 4 auditors (DeAngelo 1981). Big 4 auditors also have greater litigation concerns, with more to lose owing to their deep pockets and the capital invested in building their brand (Palmrose 1988). In addition, Big 4 auditors are expected to be more competent because their larger size allows them to attract and retain higher quality human capital (Dopuch and Simunic 1982). Prior research among already-public companies generally finds that Big 4 auditors provide higher audit quality than non-Big 4 auditors (Becker et al. 1998; Lennox and Pittman 2011; DeFond et al. 2017).

However, a growing body of research argues that Second-Tier auditors, which are commonly defined as non-Big 4 auditors that are annually (rather than triennially) inspected by the PCAOB, could provide audit quality comparable to that of Big 4 auditors (Boone et al. 2010; Cassell et al. 2013a; DeFond et al. 2017). The impetus for this comparison is the rapid post-Andersen growth of Second-Tier auditors and reforms mandated by SOX, such as the implementation of the PCAOB's inspection process. These changes are argued to have reduced the scale advantages and differential incentives for audit quality of Big 4 audit firms over Second-Tier audit firms. In addition, SOX-related changes are argued to have increased client incentives for accurate financial reporting (Nelson 2006). Consistent with such arguments, empirical evidence on already-public companies suggests that Second-Tier auditors provide audit quality comparable to that of Big 4 auditors. For example, Boone et al. (2010) and DeFond et al. (2017) find that abnormal accruals do not differ across auditor type (i.e., Big 4 vs. Second-Tier).

Cassell et al. (2013a) find that the perceived financial reporting credibility of audit clients does not vary across auditor type. Because the primary role of the IPO auditor is to provide an opinion on the financial statements included in the registration statement, the arguments for comparable audit quality between Big 4 and Second-Tier auditors are applicable in the context of IPO audits.

On the one hand, IPO companies with Big 4 auditors could be associated with higher IPO audit service quality because they could have more knowledge on a broad range of accounting issues given the depth of their experience in already-public and IPO company audits. Big 4 auditors have large international networks, large advisory practices, large SEC National Tax Office groups, and have on staff many former policy writers or board members (Daoust et al. 2021). This knowledge could allow them to better identify necessary audit adjustments or to better anticipate and respond to SEC accounting comments. Big 4 auditors also charge significant IPO audit fee premiums that could allow them to allocate more resources to IPO audits than Second-Tier auditors.

On the other hand, Second-Tier auditors have grown significantly, potentially reducing the scale advantage of Big 4 auditors in the IPO setting. The passage of SOX creates similar regulatory firm-level pressures across auditor type (i.e., annual PCAOB inspections), suggesting uniformity in firm-level audit quality control systems that could indicate no difference in IPO audit service quality across auditor type.¹² A significant number of non-Big 4 auditors are alumni of the Big 4 or their predecessor firms (Gray and Ratzinger 2010). In addition, evidence suggests that non-Big 4 auditors use a less leveraged audit staffing model where more senior employees are assigned to engagements and where audit partners provide more personalized attention to

¹² In addition, managers are expected to deliver Section 302 and 404(a) certifications in the first 10-Q and 10-K shortly after the IPO, respectively, and auditors must provide a 404(b) attestation in the second 10-K after the IPO (unless the company is an emerging-growth company and elects to opt out of this requirement), so the quality of financial reporting systems is likely improved by the anticipatory effect of these provisions (Nelson 2006).

their clients than Big 4 auditors, specifically for small and mid-sized companies (Daoust et al. 2021). Second-Tier accounting firms also have robust IPO advisory practices and frequently serve as accounting advisors (rather than as external auditors) for IPO transactions so Second-Tier auditors could have the requisite knowledge for high IPO audit service quality.

The IPO setting offers litigation and reputational concerns that suggest that Big 4 and Second-Tier auditors are both incentivized to provide high quality services. IPO auditors should have strong litigation incentives because they are subject to Section of the Securities Act of 1933. They should have strong reputational incentives because IPO audits offer high margins, the promise of a continued relationship with the IPO company as it grows, and visibility to the IPO client that could improve the associated auditor's image (Stuart 2008).

Finally, in addition to external auditors, companies preparing to go public engage with multiple other parties (e.g., underwriters, accounting advisors, legal counsel, consultants, etc.). These parties should provide a "floor" to the quality of an IPO company's financial reporting and disclosure through their monitoring and advising activities.¹³ Higher quality financial reporting could reduce the opportunity for external auditors to suggest adjustments related to transactions, account balances, and disclosures (DeFond and Zhang 2014). Therefore, there could be limited variation in IPO audit service quality across auditor type.

Given these opposing arguments, I do not predict a direction between IPO audit service quality and IPO auditor type and state the hypothesis in the null form:

H1: IPO audit service quality is not higher for Big 4 auditors.

¹³ For example, accounting advisors can directly assist clients in preparing all parts of the registration statement, including the financial statements and footnotes (EY 2018). Underwriters and lawyers conduct a "due diligence" investigation that includes meetings with management, review of documents, background checks, and calls with important customers and suppliers (STB 2016). Companies also often create a project management office lead by a qualified advisory firm that organizes and monitors the IPO process and coordinates knowledge transfer between involved parties (Protiviti 2021).

SECTION III. RESEARCH DESIGN

Tests of Pre-IPO Discretionary Accruals

My first measures of IPO audit service quality include absolute and signed pre-IPO discretionary accruals. Higher values of absolute discretionary accruals indicate that auditors allowed management to engage in more income-increasing or income-decreasing earnings management, indicating lower audit quality because the financial statements less faithfully reflect the company's underlying economics (Johnson et al. 2002; DeFond and Zhang 2014). I also examine signed discretionary accruals because there is greater risk to auditors for inflated earnings so higher values reflect lower audit quality because the auditor was less conservative (Becker et al. 1998; Heninger 2001; Lennox et al. 2016; Lee et al. 2019).

Pre-IPO discretionary accruals are estimated for the most recent fiscal year (year $t-1$) (i.e., pre-IPO year) before the company goes public (year t) (i.e., IPO year). I estimate discretionary accruals in two ways. First, I use the residual from the cross-sectional performance-adjusted modified Jones model (Dechow et al. 1995; Kothari et al. 2005) estimated for IPO companies in my sample by two-digit SIC code after omitting companies in regulated industries and financial companies (two-digit SIC codes 40-49 and 60-69).¹⁴ Second, I use the performance-adjusted modified Jones model fit by 2-digit SIC to all available non-IPO companies in Compustat during my sample period with non-missing assets, less than \$1 billion in annual revenues, and that use a Big 4 or Second-Tier auditor (Teoh et al. 1998; Ball and

¹⁴ To calculate discretionary accruals, I use the following model:

$TA_{i,t-1} = \beta_0 + \beta_1 (1/ASSET_{i,t-2}) + \beta_2 (\Delta REV_{i,t-1} - \Delta AR_{i,t-1}) + \beta_3 PPE_{i,t-1} + \beta_4 ROA_{i,t-1} + e_{i,t-1}$, where $t-1$ is the pre-IPO year for IPO company i ; TA is total accruals, measured as earnings before extraordinary items (IB) minus net cash flow from operations excluding extraordinary items (OANCF); ΔREV is the change in revenues; ΔAR is the change in receivables; PPE is gross property, plant, and equipment; ROA is net income; and all variables are scaled by lagged total assets. I use all available IPO observations in two-digit SIC industries with at least ten observations and with at least \$1 million in assets and revenues in the current and prior year. To minimize the impact of extreme observations, I follow Ball and Shivakumar (2008) and trim variables entering the model at the ± 1 percent level.

Shivakumar 2008). I then apply the saved coefficients to IPO company data and the IPO company residual reflects discretionary accruals. This alternative method could allow for a better estimate of discretionary accruals because a larger number of observations are used to estimate coefficients in the expected accruals model. It relies on the assumption that the non-discretionary accruals of IPOs are determined in the same way as non-IPOs, which should be the case given the subset of non-IPO companies used for the estimation share important characteristics with IPOs in my sample (i.e., industry, revenues, auditor type).

To test whether auditor type is associated with absolute (*ABS_DACC_1*; *ABS_DACC_2*) and signed (*DACC_1*; *DACC_2*) discretionary accruals I use the following model:

$$\begin{aligned}
 \text{Disc. Accruals}_{i,t-1} = & \beta_0 + \beta_1 \text{BIG_4}_{i,t-1} + \beta_2 \text{AGE}_{i,t-1} + \beta_3 \text{AUD_CHANGE}_{i,t-1} + \beta_4 \text{EGC}_{i,t-1} \\
 & + \beta_5 \text{FOREIGN}_{i,t-1} + \beta_6 \text{GROWTH}_{i,t-1} + \beta_7 \text{LEVERAGE}_{i,t-1} + \beta_8 \text{LITIGIOUS}_{i,t-1} \\
 & + \beta_9 \text{LOSS}_{i,t-1} + \beta_{10} \text{PCT_RETAINED}_{i,t-1} + \beta_{11} \text{PRESTIGIOUS_UW}_{i,t-1} \\
 & + \beta_{12} \text{PROCEEDS}_{i,t-1} + \beta_{13} \text{ROA}_{i,t-1} + \beta_{14} \text{SEGMENTS}_{i,t-1} + \beta_{15} \text{SIZE}_{i,t-1} \\
 & + \beta_{16} \text{TECH}_{i,t-1} + \beta_{17} \text{VC}_{i,t-1} + \beta_k \text{Industry FE} + \beta_k \text{Year FE} + e_{i,t-1} \quad (1)
 \end{aligned}$$

where *Industry* and *Year* represent industry and year fixed effects, respectively; *i* represents IPO company; and *t-1* represents the pre-IPO year. A negative and significant coefficient on *BIG_4* would suggest that Big 4 auditors provide higher IPO audit service quality. Equation (1) is estimated using ordinary least squares (OLS) and robust standard errors. All variables are defined in Appendix A.

My model is motivated by prior research on pre-IPO earnings quality measured through discretionary accruals (e.g., Venkataram et al. 2008; Ball and Shivakumar 2008; Wongsunwai 2013). I control for financial performance using return on assets (*ROA*), the presence of a loss (*LOSS*), and revenue growth (*GROWTH*) because financial performance is important to investor assessments of company value (Brau and Fawcett 2006). I also control for the company's financial condition (*LEVERAGE*), size (*SIZE*), and the length of the company's operating history from its founding to the date of the IPO (*AGE*). I include controls for the complexity of the

company, including the number of total business and geographic segments (*SEGMENTS*) and the presence of foreign operations (*FOREIGN*). I also control for whether the company is a technology company (*TECH*) because they are more difficult to audit, with more intangible assets and often reporting losses resulting from their high levels of research and development expenditure (Demers and Joos 2007).

I include controls for litigation risk because audit quality is a function of the potential litigation exposure faced by the client and its auditor (Palmrose 1988). Specifically, I include a control for whether the company is in a litigious industry (*LITIGIOUS*) (Francis et al. 1994; Kim and Skinner 2012), as well as for the size of the offering (*PROCEEDS*) because the upper limit on damages suffered due to litigation under the Securities Act of 1933 is a function of the size of the offering (Willenborg 1999). I also control for underwriter prestige (*PRESTIGIOUS_UW*) because higher quality underwriters could restrict a company's incentives for earnings management to protect their reputation and avoid litigation risks (Jo et al. 2007). I control for the presence of venture capital investment (*VC*) because venture capitalists play a monitoring role and are associated with pre-IPO earnings management (Morsfield and Tan 2006). I control for the percentage of the company retained by pre-IPO shareholders (*PCT_RETAINED*) because Leland and Pyle (1977) argue that a high level of retained ownership is a positive signal about the private information of managers. Managers could be more willing to manage earnings when they have negative information about company value. I control for the presence of an auditor change in the pre-IPO period (*AUD_CHANGE*) because auditors experience a learning curve that could influence the quality of the services that they provide (Cassell et al. 2017). I also control for whether the company is an emerging-growth company (*EGC*) because, following the Jumpstart Our Business Startups (*JOBS*) Act of 2012, EGC companies were allowed to provide

reduced financial reporting disclosures. Reduced disclosure requirements could impact the complexity of the pre-IPO audit or the reporting incentives of managers, which could influence discretionary accruals.

Tests of SEC Accounting Comment Letters

My second measure of IPO audit service quality is the extent to which IPO companies are initially compliant with SEC reporting guidelines. $ACC_CMTS_I^{st}$ is the number of accounting comments in the SEC comment letter issued to the company following its initial review of the registration statement. More accounting comments suggest that the SEC raised more accounting treatment and disclosure concerns about the company. Because the IPO auditor provides feedback to the company on the initial registration statement before it is submitted to the SEC and because accounting comments often relate to audited financial information and disclosures, more initial accounting comments suggest lower IPO audit service quality.

To test whether auditor type is associated with initial SEC accounting comments, I use the following model:

$$\begin{aligned}
 ACC_CMTS_I^{st}_i = & \eta_0 + \eta_1 BIG_4_{i,t-1} + \eta_2 AGE_{i,t-1} + \eta_3 AUD_CHANGE_{i,t-1} + \eta_4 EGC_{i,t-1} \\
 & + \eta_5 FOREIGN_{i,t-1} + \eta_6 GROWTH_{i,t-1} + \eta_7 LEVERAGE_{i,t-1} + \eta_8 LITIGIOUS_{i,t-1} \\
 & + \eta_9 LOSS_{i,t-1} + \eta_{10} PCT_RETAINED_{i,t-1} + \eta_{11} PRESTIGIOUS_UW_{i,t-1} \\
 & + \eta_{12} PROCEEDS_{i,t-1} + \eta_{13} ROA_{i,t-1} + \eta_{14} SEGMENTS_{i,t-1} + \eta_{15} SIZE_{i,t-1} \\
 & + \eta_{16} TECH_{i,t-1} + \eta_{17} VC_{i,t-1} + \eta_k Industry FE + \eta_k Year FE + e_{i,t-1} \quad (2)
 \end{aligned}$$

where the variables *Industry* and *Year* represent industry and year fixed effects, respectively; *i* represents IPO company; and *t-1* represents the pre-IPO year. A negative and significant coefficient on *BIG_4* would suggest that Big 4 auditors provide higher IPO audit service quality. Equation (2) is estimated using OLS and robust standard errors. All variables are defined in Appendix A.

I control for issuer size (*SIZE*), financial performance (*ROA*; *GROWTH*; *LOSS*) and financial condition (*LEVERAGE*) because these factors could influence manager incentives for

financial reporting and disclosure quality in the registration statement. I also control for complexity (*SEGMENTS*; *FOREIGN*) because it may allow a company to conceal manipulation of accounting information (Cassell et al. 2013b). I control for age (*AGE*) because prior research documents older companies receive more SEC comment letters (Heese et al. 2017). I also include indicator variables for the presence of venture capital investment (*VC*) and a prestigious underwriter (*PRESTIGIOUS_UW*) because these parties could influence disclosure quality in the registration statement (Köchling et al. 2021).

I control for litigation risk by including an indicator if the company is in a litigious industry (*LITIGOUS*) and by including a control for the offering proceeds (*PROCEEDS*). Venkataraman et al. (2008) argue that litigation exposure in IPO companies is a function of the upper limit on damages under the Securities Act of 1933 and that auditor quality is influenced by this litigation exposure. I also control for the portion of the company retained by pre-IPO shareholders (*PCT_RETAINED*) because Leland and Pyle (1977) argue it is a signal about the private information of managers and financial reporting and disclosure could vary with manager knowledge about the prospects of the company.

I include an indicator variable for the presence of an auditor change in the pre-IPO period (*AUD_CHANGE*) because new auditors experience a learning curve (Cassell et al. 2017). I control for whether the IPO is an emerging-growth company (*EGC*) because EGC status permits more limited disclosures, reducing the opportunity for SEC staff to identify accounting concerns. I control for whether the company is a technology company (*TECH*) because they rely more heavily upon intangible assets and often report significant accounting losses resulting from their high levels of expenditures on research and development (Demers and Joos 2007). This could make the audit more difficult or provide additional opportunities for SEC staff comments.

SECTION IV. SAMPLE AND DESCRIPTIVE STATISTICS

As outlined in Table 1 Panel A, I construct my sample using the Securities Data Corporation (SDC) database to identify all firm-commitment IPOs on major U.S. stock exchanges (i.e., NASDAQ, NYSE, and AMEX) between January 1, 2005, and December 31, 2019. My sample begins after important SOX-related provisions went into effect, including PCAOB inspections, requirements around the audit committee’s engagement of auditors, prohibition of certain non-audit services, and stock exchange corporate governance requirements (Nelson 2006). I limit my sample to IPO companies that issue common or Class A shares. I exclude companies in regulated (two-digit SIC 40–49) and financial industries (two-digit SIC 60–69). Removing companies in the financial industry excludes IPOs that are leveraged buyouts, closed-end funds, open-end funds, trusts, special purpose acquisition companies, and special purpose vehicles (Barth et al. 2017). These sample restrictions ensure that IPO companies in my sample are conducting similar offerings and obtaining similar IPO audit services.

From SDC, I collect the IPO date, offering size, underwriter identity, venture capital investment, and the number of shares offered as part of and outstanding after the IPO. I use Audit Analytics to identify the IPO auditor, the emerging-growth status of the company, and information on SEC comment letters.¹⁵ I obtain financial statement information in the pre-IPO year and two years before the IPO year from Compustat and remove observations for which control data are unavailable. I also remove observations with only one IPO in an industry during my sample period (based on two-digit SIC code) because such observations can confound interpretation of my variable of interest in models with industry fixed effects (DeHaan 2021).

¹⁵ For 2.92% of the observations in my final sample, there exists no comment letter information in Audit Analytics. I assume these companies receive no accounting comments. My inferences remain unchanged if I exclude these observations from my sample.

Table 1, Panel B shows that the proportion of Big 4 IPO audits has been generally consistent over time. In nine of the fifteen years in my sample, Big 4 auditors provide between 80 and 90 percent of IPO audit services. In five of the fifteen years, they provide over 90 percent. It is only in 2008 that Big 4 auditors provide less than 80 percent of IPO audits (75 percent), but there were only eight total IPOs in my sample during this year due to the financial crisis.

Table 1, Panel C presents the number of total small and mid-sized IPO audits in my sample by auditor type (i.e., Big 4 vs. Second-Tier) and by IPO company revenue in the pre-IPO year. I partition revenues based on whether the IPO company had less than \$100 million, \$100 to \$500 million, or \$500 million to \$1 billion of pre-IPO year revenue. The table shows that Big 4 auditors provide between 87.0 and 88.2 percent of audits in all three revenue categories. Although the market share of Second-Tier auditors is limited, the tables suggests that they compete in all segments of the small and mid-sized IPO audit market.¹⁶

Table 1, Panel D shows the distribution of IPO audits by audit firm. Significant variation exists in the market share of each of the Big 4, with Ernst and Young auditing the largest share of small and mid-sized IPO audits (39.2 percent) and KPMG auditing the smallest share (12.4 percent). Grant Thornton and BDO have the first and second largest share of IPO audits among Second-Tier auditors (5.3 percent and 3.9 percent, respectively).

Table 2, Panel A presents descriptive statistics for control variables in my models by auditor type. IPO companies audited by the Big 4 are similar to those audited by Second-Tier auditors along several important characteristics, such as assets (*SIZE*), revenues (*REVENUE*),

¹⁶ Note that this figure does not consider the market share of non-annually inspected (i.e., small) auditors because I do not include them in my final sample. When I include small auditor IPOs, I find that the Big 4 market share is 78.4% for companies with less than \$100 million in revenues, 84.6% for companies between \$100 and \$500 million in revenues, and 87.5% for companies with \$500 million and \$1 billion in revenues. Small auditors appear to only compete for audits with less than \$100 million in revenues. For these IPOs, I find that the average small auditor IPO client has less than half the revenues and assets of the average Second-Tier and Big 4 client, confirming that small auditors compete for a different group of IPO clients than other auditors.

revenue growth (*GROWTH*), offering size (*PROCEEDS*), and the proportion of shares retained by pre-IPO shareholders (*PCT_RETAINED*). The similarities across these characteristics support the appropriateness of using a control group of Second-Tier IPO clients as a valid counterfactual for the treatment group of Big 4 IPO clients.

However, IPO companies with Big 4 auditors are younger (*AGE*), less profitable (*LOSS*), more complex (*SEGMENTS*), have more foreign operations (*FOREIGN*), and are more likely to be in a litigious industry (*LITIGIOUS*). They are also more likely to be a technology company (*TECH*), to have a reputable underwriter (*PRESTIGIOUS_UW*) and to receive venture capital investment (*VC*). Still, there is considerable overlap along these dimensions.

Table 2, Panel B presents descriptive statistics and univariate comparisons for the outcome variables in my models by auditor type. Mean absolute discretionary accruals (*ABS_DACC_1*; *ABS_DACC_2*) are not statistically different across groups. However, mean signed discretionary accruals (*DACC_1*; *DACC_2*) are negative for Big 4 IPO clients but positive for Second-Tier IPO clients. This difference is statistically significant, suggesting that Second-Tier IPO clients engage in more income-increasing earnings management. Big 4 IPO clients receive fewer initial accounting comments (*ACC_CMTS_1st*, 4.85 vs. 5.74) and fewer subsequent accounting comments (*ACC_CMTS_SUBS*, 3.95 vs. 5.21) and both differences are statistically significant.

SECTION V. EMPIRICAL RESULTS

The Association Between Pre-IPO Discretionary Accruals and Big 4 Auditors

Table 3 presents the relation between pre-IPO year discretionary accruals and the use of a Big 4 auditor. In Column (1), the coefficient on *BIG_4* is negative and significant ($p < 0.05$); this indicates that Big 4 clients are associated with lower absolute discretionary accruals than Second-Tier clients (*ABS_DACC_1*). Column (2) shows the coefficient on *BIG_4* is also negative and significant ($p < 0.10$) when the parameters for expected accruals are estimated using a group of similar non-IPO companies rather than IPO companies in my sample (*ABS_DACC_2*). Columns (1) and (2) indicate that absolute discretionary accruals are lower for Big 4 clients, or that their financial statements more faithfully reflect the economic activities of the company, suggesting higher IPO audit service quality.

In Column (3), the coefficient on *BIG_4* is negative and significant ($p < 0.01$); this suggests that Big 4 clients are associated with lower signed discretionary accruals than Second-Tier clients (*DACC_1*) ($p < 0.01$). Column (4) shows that the coefficient on Big 4 is also negative and significant ($p < 0.01$) when the parameters for expected accruals are estimated using a group of similar non-IPO companies (*DACC_2*). Columns (3) and (4) indicate that Big 4 auditors are more conservative (i.e., more likely to require adjustments that reduce earnings), suggesting higher IPO audit service quality.¹⁷

¹⁷ In untabulated analyses, I examine whether performance-matched pre-IPO signed discretionary accruals differ for Big 4 and Second-Tier IPO clients. I follow the portfolio-matching approach in Venkataraman et al. (2008). Specifically, I use the Jones model (Jones 1991) and estimate discretionary accruals by 2-digit industry for companies in my sample. I then sort companies within each 2-digit industry into quintiles by performance (i.e., lagged ROA, which is not included in the Jones model) and identify the median discretionary accrual in each quintile. To calculate performance-matched discretionary accruals, I subtract the relevant median discretionary accrual in each quintile from the IPO company's discretionary accrual. Mean signed discretionary accruals are negative for Big 4 IPOs (0.037) and positive for Second-Tier IPOs (0.062) and the difference is statistically different from zero, suggesting Big 4 auditors are more conservative.

The Association between SEC Accounting Comments and Big 4 Auditors

Table 4 presents the association between the extent of initial SEC accounting comments related to the registration statement and the use of a Big 4 auditor. In Column (1), the coefficient on *BIG_4* is negative and significant; this indicates that Big 4 clients receive fewer initial accounting comments ($p < 0.01$). Because auditors provide clients advice on the draft registration statement before it is submitted to the SEC, this finding suggest that Big 4 auditors are better able to advise clients on achieving initial compliance with SEC reporting standards.

In Column (2), I examine the number of subsequent accounting comments received by IPO companies. I use Model (2) and control for initial accounting comments, but also include an interaction between *ACC_CMTS_1st* and *BIG_4* to test whether the persistence of initial accounting comments varies between Big 4 and Second-Tier auditors. If a company's response to an initial comment letter does not satisfy the SEC, it will issue subsequent accounting comment(s) to the company on the matter. IPO auditors can influence the extent of subsequent accounting comments by advising IPO clients on their response.

Column (2) shows that the interaction between *ACC_CMTS_1st* and *BIG_4* is negative and significant ($p < 0.10$), suggesting that the association between initial accounting comments and subsequent accounting comments is weaker for Big 4 IPO clients or that Big 4 auditors help their clients more effectively address initial accounting issues raised by the SEC.¹⁸

¹⁸ I also examine registration statement delay, or the number of days between when a company files its first and last S-1 registration statement with the SEC. I find that that Big 4 (Second-Tier) IPO clients average 153 (157) days. This supports the notion that the Big 4 and Second-Tier companies in my sample are similar. However, it is not a strong measure of audit quality because a number of non-accounting related factors can influence the registration statement delay (e.g., managerial desire to negotiate with the SEC during the process; new developments that materially affect the company, etc.).

Additional Analyses and Robustness Tests

Topics in Initial SEC Accounting Comments

Next, because an initial SEC comment letter typically includes multiple accounting comments on different topics, I examine the accounting comment topics most frequently received by auditor type.

Table 5, Panel A presents the fifteen most common accounting topics raised by the SEC in initial SEC accounting comments on the registration statement for Big 4 and Second-Tier IPO clients. Columns (1) and (2) show that the top five accounting topics are identical for both Big 4 and Second-Tier clients and include 1) Deferred, stock-based, and/or executive compensation 2) Fair value measurement, estimates, and use 3) Debt, quasi-debt, warrants, and equity securities 4) Revenue recognition and 5) Earnings per share and income statement classification. Columns (3) and (4) show that there is a sharp decline in the number and percentage of IPO clients, respectively, receiving comments in the fifth through fifteenth most frequently observed topics. In addition, 13 of the 15 topics are the same across auditor type. This suggests that Big 4 and Second-Tier auditors are likely to face similar concerns during their IPO audits and that it is reasonable to compare audit quality across the two auditor types for small and mid-sized IPOs. In Figure 1, I present the frequency of accounting comment topics in initial SEC comment letters by auditor type.

In Table 5, Panel B I present the average number of accounting topics by category for Big 4 and Second-Tier auditors. I use a modified version of the Palmrose and Scholz (2004) framework, as described in Cassell et al. (2013b), to categorize accounting topics into four categories: Core Earnings (e.g., revenues, operating expenses), Non-Core Earnings (e.g., impairments, restructurings), Classification Issues (e.g., balance sheet and cash flow

classification issues), and Fair Value issues. Core Earnings topics reflect issues related to primary operating activities while Non-Core Earnings topics affect special one-time or non-operating activities.

Panel B shows that for both Big 4 and Second-Tier auditors, comments relating to Non-Core Earnings ($NON_CORE_CMTS_I^{st}$) are the most common, followed by comments relating to Core Earnings ($NON_CORE_CMTS_I^{st}$), Fair Value ($FV_CMTS_I^{st}$), and Classification ($CLASS_CMTS_I^{st}$). A univariate comparison of means across auditor type shows that Big 4 auditors receive fewer comments on topics relating to Non-Core Earnings, but that there is no difference for across other topic categories. In untabulated multivariate regressions, I use Model (2) and replace $ACC_CMTS_I^{st}$ with each of four accounting comment category variables, similarly finding that Big 4 auditors only receive fewer comments relating to Non-Core Earnings ($p < 0.01$). Because Non-Core Earnings comments relate to one-time or non-operating activities, these findings are consistent with the notion that Big 4 auditors have deep knowledge on a broad range of accounting issues that allows them to provide high quality IPO audit services.

Robustness to Entropy Balancing

In Table 6, Column (1) I present a summary of the sign, magnitude, and statistical significance of the coefficient on the variable of interest (i.e., BIG_4) for the main regressions in my study. Overall, my results suggest that Big 4 auditors are associated with higher IPO audit service quality, but a causal interpretation of this finding could be inappropriate.

Imbens and Rubin (2015) note that causal interpretation requires the unconfoundedness assumption, or that the assignment of units to treatment does not depend on the potential outcome. This assumption may not hold when investigating differences in audit quality between Big 4 and Second-Tier auditors because Big 4 clients could have higher inherent financial

reporting quality. Higher inherent financial reporting quality could impact the likelihood of engaging a Big 4 auditor because Big 4 auditors may choose low-risk clients or because inherent financial reporting quality influences the client's demand for audit quality. It could also influence the potential outcome because the audit quality measures that I use are based on client financial reporting quality. However, it is unclear to what extent IPO auditor-client alignment is based on inherent financial reporting quality and audit demand because private companies have not previously had to comply with public company financial reporting standards and they have not previously had to purchase an audit performed under PCAOB standards. In addition, I have controlled for a number of observable company characteristics that should capture aspects of the company's financial reporting quality and demand for audit (e.g., size, growth, complexity, leverage, etc.).

Although I cannot rule out the possibility that unobservable characteristics weaken the unconfoundedness assumption, I seek to support the assumption regarding observable characteristics associated with auditor choice and audit quality in several ways. I have limited my sample to IPO companies with pre-IPO year revenues of less than \$1 billion and my control group to only Second-Tier auditors. If the assignment to treatment is confounded with the potential outcome, the characteristics of the units in the treatment sample and those in the control sample will systematically differ. Big 4 and Second-Tier clients in my sample are balanced on important company characteristics, including assets, revenues, and growth. They are also balanced on important offering characteristics, such as offering size and the percentage of shares retained by pre-IPO shareholders.

While there are many similarities between Big 4 and Second-Tier IPO clients in my sample, there are also several differences. For instance, Big 4 clients are younger and less leveraged,

have more foreign operations, and are more likely to use a prestigious underwriter and receive venture capital investment. Given such differences, I employ entropy balancing, a technique that assigns weights to observations such that those more likely to have received treatment (i.e., to have engaged a Big 4 auditor) are assigned greater weights (Hainmueller 2012).¹⁹ Prior research on Big 4 audit quality has similarly attempted to strengthen the unfoundedness assumption with regard to observables by improving covariate balance across treatment and control samples through data pre-processing techniques (Lawrence et al. 2011; DeFond et al. 2017).

In Table 6, Column (2) I present the results of my main tests when using an entropy-balanced sample. My inferences remain unchanged.²⁰

Litigation Risk and Litigation Outcomes

Auditors consider litigation risk in their client acceptance decisions because they are concerned about the legal and reputational costs resulting from litigation (Johnstone and Bedard 2004; Schroeder and Hogan 2013). Relatedly, litigation risk is a driver of audit quality because auditors take steps to mitigate risk stemming from low-quality financial reporting and disclosures (Palmrose 1988). As discussed previously, litigation risk is higher for IPO companies than already-public companies because they are subject to the Securities Act of 1933, which does not require that a defendant makes a material omission or untruth in the registration statement with knowledge or intent. A particular concern in my study is that litigation risk varies systematically with the assignment to a Big 4 IPO audit and with observed audit quality, but that I have not adequately controlled for it. I perform several analyses to assess whether this is likely.

¹⁹ Recent research in accounting using entropy balancing includes Haislip et al. (2017), Ege, Glenn, and Robinson (2020), and Laurion (2020), among others.

²⁰ DeFond et al. (2017) argue there are at least two reasons why the Big 4 effect may not be attributable to selection bias. First, Big 4 auditors' competency should result in higher audit quality even for low-risk clients. Second, it is difficult to explain the Big 4 audit fee premium if their clients have inherently higher financial reporting quality.

I first examine how litigation risk varies between Big 4 and Second-Tier IPO clients. My goal is to capture *ex ante* litigation risk because this is the risk relevant to auditors when deciding whether to take on a pre-IPO client. I examine a set of client characteristics, motivated by Kim and Skinner (2012), that could increase the risk of future securities class action lawsuit filings, either through increasing the likelihood of price decline or the magnitude of potential damages.²¹ Kim and Skinner (2012) consider litigious industry membership, size, growth, and client return characteristics such as stock volatility, stock turnover, stock returns, and stock skewness in the period prior to the litigation period. The rationale for these variables is that “firms tend to get sued after a period of unusually strong growth and/or stock price run up that subsequently reverses and that the likelihood of litigation is higher for larger firms and firms with more volatile stock returns” (Kim and Skinner 2012, p. 303). Because the stock of IPO companies is not publicly traded, stock return data is not available, so I follow Lowry and Shu (2002) to calculate IPO company return characteristics using a matched sample of peer non-IPO companies in the same 3-digit SIC industry and within 80-120 percent of the IPO company’s market capitalization. I also include the proceeds of the offering because it establishes the upper limit on damages under the Securities Act of 1933 (Willenborg 1999; Venkataraman et al. 2008) and the presence of venture capital investment (*VC*) and a prestigious underwriter (*PRESTIGE_UW*) because these parties could influence auditor-client alignment through expressed preferences of auditor type and a desire to avoid association with an IPO company that experiences litigation.

In Table 7, Panel A I find some evidence that Big 4 IPO clients have higher *ex ante* litigation risk. Big 4 clients are more likely to be in a litigious industry (*LITIGIOUS*) and have

²¹ Consistent with Kim and Skinner (2012), I examine *ex ante* litigation risk with regard to lawsuit filings because auditors main goal is to avoid the legal, reputational, and time costs of a lawsuit filing.

greater expected share turnover (*PEER_TURNOVER*). However, there are no differences across auditor type along any of the six other ex ante litigation risk factors. I have controlled for *LITIGIOUS* in my main analyses and my inferences are robust to including *PEER_TURNOVER* in my models (untabulated).

It remains possible that these characteristics fail to capture a relevant aspect of ex ante litigation risk that varies with the use of a Big 4 auditor. If this were the case, because ex ante litigation risk should be associated with ex post litigation outcomes, a model of ex post litigation outcomes on the use of a Big 4 auditor that controls for ex-ante litigation risk should reveal a significant association on Big 4, reflecting the effect of a correlated omitted variable.²²

In Table 7, Panel B I present the association between the filing of IPO-related lawsuits and the use of a Big 4 auditor, controlling for ex ante litigation risk. I use the Audit Analytics Legal database to obtain data on filed securities class action cases under the Securities Act of 1933. The models are motivated by Kim and Skinner (2012). The area under the receiver operating characteristic (ROC) curve is above 0.70 for all models, indicating acceptable discriminatory power (Hosmer and Lemeshow 2002). Company size (*SIZE*) and stock return volatility (*PEER_VOLATILITY*) appear to be the strongest predictors of filed IPO-related lawsuits.²³ Across all specifications, the coefficient on *BIG_4* is insignificant, suggesting there is no relation between the use of a Big 4 auditor and the filing of IPO-related lawsuits, alleviating concerns of a correlated omitted variable related to ex ante litigation risk.

Table 7, Panel B also suggests that Big 4 IPO clients are *not* more likely to be named in

²² For example, a risk-seeking management culture could impact the likelihood that an IPO-related lawsuit is filed. Big 4 auditors could be less likely to accept clients with a more risk-seeking management culture.

²³ I find that the expected stock return measures are highly correlated (untabulated), explaining why *PEER_VOLATILITY* is not significant in Column (4) of Table 7, Panel B. I also find that company size (*SIZE*) and offering proceeds (*PROCEEDS*) are highly correlated and opt to include only *SIZE* in the litigation outcome regressions. The coefficient on *BIG_4* remains insignificant whether *SIZE*, *PROCEEDS*, or both variables are included in the filed IPO-related lawsuit model.

IPO-related litigation than Second-Tier IPO clients. Prior research suggests that Big 4 auditors may be preferred in IPOs because they could reduce the risk of litigation against the IPO company or underwriter and because their “deep pockets” allow for greater recovery in the event of litigation (i.e., an insurance role) (Menon and Williams 1991; Willenborg 1999). Higher quality auditors should be better able to reduce material omissions or untruths in the registration statement, a necessary condition for IPO-related litigation. However, I find no significant association between IPO-related litigation and the use of a Big 4 auditor after controlling for ex-ante litigation risk.²⁴

In Table 7, Panel C I show the frequency of filed IPO lawsuits by auditor type. Note that these IPO lawsuits always name the IPO company as a defendant but may or may not name the auditor as a defendant based on whether the plaintiff believes the material omission or misstatement was related to the audited financial statements rather than other parts of the registration statement. Regardless of whether the auditor is named in the lawsuit, auditors have incentives to avoid their IPO clients being sued (e.g., reputational costs). I find that IPO clients are sued in 7.65 percent of Big 4 IPO audits and in 8.40 percent of Second-Tier IPO audits, but this difference is not statistically significant. While Big 4 auditors are more frequently named as defendants in IPO lawsuits (0.87 percent and 0.00 percent), the small number of named auditors in these lawsuits does not seem to suggest that IPO companies, their underwriters, or others involved in the transaction should prefer Big 4 auditors because they expect a reduction in the probability of IPO-related lawsuit filings.²⁵

²⁴ The absence of a relation between filed IPO lawsuits and the use of a Big 4 auditor could be explained if Big 4 auditors more effectively respond to ex ante litigation risk. To test whether this is the case, I use the model in Column 3 of Table 7, Panel B and include an interaction between *BIG_4* and either *SIZE* or *PEER_VOLATILITY*, finding the coefficient on each is insignificant.

²⁵ The rate at which auditors are named in IPO-related litigation appears reasonable because, according to Cornerstone Research (2019), auditors were named as defendants in less than 1 percent of federal securities class actions filed between 2015 and 2019. Venkataraman et al. (2008) find that auditors are sued in connection with 4%

In Table 7, Panel D I show descriptive statistics on litigation outcomes and, for settled cases, settlement amounts by auditor type. Lawsuits against Big 4 (Second-Tier) clients are settled in 51.06% (50.00%) of cases. Lawsuits against Big 4 (Second-Tier) clients are dismissed in 25.5% (37.5%) of cases. Big 4 clients settle for larger amounts (\$7.04 million vs. \$4.69 million) and these amounts constitute a greater proportion of the related clients's assets, revenues, and proceeds than settlements for Second-Tier clients. Second-Tier clients have larger assets and revenues, but smaller IPO proceeds. Overall, while settlement amounts are larger for Big 4 IPO clients, the low rate at which auditors are named in these lawsuit filings and the relatively modest settlement amounts paid by their IPO clients suggest that those involved with auditor selection should not prefer Big 4 auditors because their "deep pockets" allow for greater recovery in the event of adverse legal events. Again, these inferences are limited to small and mid-sized IPO companies.

Audit Fees

Prior research suggests that the decision to use a Big 4 auditor for the IPO is influenced by cost considerations (Hogan 1997). Although documenting the Big 4 IPO audit fee premium has not been the intent of prior work on IPO auditors and audit fees, models typically control for the use of a Big 4 auditor and find that it is positively associated with IPO audit fees (e.g., Venkataraman et al. 2008; Khurana et al. 2019). However, these studies use non-Big 4 auditors as their control group. The purpose of my analysis is to examine the difference in IPO audit fees between Big 4 and Second-Tier auditors.

of IPOs from 1960 to 1993. The lower percentage of filed IPO lawsuits against auditors in my sample could be attributable to the Private Securities Litigation Reform Act of 1995, which made it more difficult for investors to bring securities-related lawsuits against auditors (Lee and Mande 2003).

In Table 8 Panel A, I present descriptive statistics for IPO audit fees.²⁶ Services related to the IPO can be disclosed in either the pre-IPO year, the IPO year, or both years. The mean of pre-IPO year audit fees for Big 4 (Second-Tier) auditors is \$0.78 million (\$0.47 million). The mean of IPO year audit fees for Big 4 (Second-Tier) auditors is \$1.29 million (\$0.66 million). The mean of total audit fees across both years for IPO companies with Big 4 (Second-Tier) auditors is \$2.07 million (\$1.14 million).

In Table 8 Panel B, I present associations between the use of a Big 4 auditor and audit fees for IPO companies. Theory suggests that audit fees are a function of the marginal cost of auditing and expected losses from litigation (Simunic 1980). Consistent with prior research, I include controls for factors documented to influence audit fees, including company size, complexity, growth, profitability, age, litigation risk, and the presence of additional monitors and advisors (i.e., underwriter prestige and venture capital investment) (Beatty 1993; Willenborg 1999; Hay et al. 2006, Venkataraman et al. 2008, Hay 2013). Because audit fees related to the IPO can be disclosed in either the pre-IPO or the IPO year, I model this relation in three ways.

In Column (1), I examine the relation between the use of a Big 4 auditor and pre-IPO year audit fees. All controls are measured as of the pre-IPO year. The coefficient on *BIG_4* is positive and significant ($p < 0.01$). My results suggest that, after controlling for other factors that influence audit fees, Big 4 clients pay 45.2% higher fees in the pre-IPO, equivalent to \$0.34 million higher audit fees for a representative IPO in my sample.²⁷

²⁶ IPO audit fees are disclosed in the proxy statement filed by the company after it goes public. The audit fee category in the proxy can include fees paid for the audit of the registrant's annual financial statements, review of the quarterly financial statements, and services normally provided by the accountant in connection with statutory and regulatory filings or engagements. Audit fees can also include fees which generally only the independent accountant can reasonably provide, such as comfort letters, statutory audits, attest services, consents, and assistance with and review of documents filed with the SEC. See SEC Release No. 33-8183; 34-47265; 35-27642; IC-25915; IA-2103, 68 FR 6006 (February 5, 2003). <http://www.sec.gov/rules/final/33-8183.htm>.

²⁷ The Big 4 pre-IPO year audit fee premium is calculated as $(e^{0.373} - 1) * 100 = 45.2\%$. To calculate the economic significance, I multiply the sample mean of pre-IPO year audit fees (\$0.74 million) by 45.2%.

In Column (2), I examine the relation between the use of a Big 4 auditor and IPO year audit fees. All controls are measured as of the IPO year. I find that Big 4 IPO clients pay significantly higher IPO year audit fees ($p < 0.01$). My results suggest that Big 4 clients pay 65.9% higher fees in the IPO year, equivalent to \$0.80 million higher audit fees for a representative IPO in my sample.^{28,29}

In Column (3), I examine the relation between audit fees and the use of a Big 4 IPO auditor where the audit fees include the sum of pre-IPO and IPO year audit fees. I find that Big 4 IPO clients pay higher audit fees ($p < 0.01$). My results suggest that Big 4 IPO clients pay 63.07% higher fees over the pre-IPO and IPO year, equivalent to \$1.24 million higher audit fees for a representative IPO in my sample.³⁰ Overall, my results suggest that Big 4 IPO clients between 45.2% and 65.9% higher audit fees for services related to the IPO.

²⁸ The Big 4 IPO year audit fee premium is calculated as $(e^{0.506} - 1) * 100 = 65.90\%$. To calculate the economic significance, I multiply the sample mean of IPO year audit fees (\$1.22 million) by 65.90%.

²⁹ Note that *AUD_CHANGE* is missing when my regression includes IPO year audit fees because if a company switches auditors between going public and the filing of its first proxy statement, only the newly appointed auditor (who didn't work on the IPO) is required to disclose audit fees.

³⁰ The Big 4 IPO audit fee premium is calculated as $(e^{0.489} - 1) * 100 = 63.1\%$. To calculate the economic significance, I multiply the sample mean of the sum of pre-IPO year and IPO year audit fees (\$1.96 million) by 63.1%.

SECTION VI. CONCLUSION

In this study, I examine whether IPO audit service quality differs between Big 4 and Second-Tier auditors for a sample of small and mid-sized IPOs. Big 4 auditors perform most initial public offering (IPO) audits, but there is limited empirical evidence on whether they provide higher IPO audit service quality. Collectively, my results suggest that Big 4 auditors provide higher IPO audit service quality than Second-Tier auditors, as evidenced by lower discretionary accruals and fewer initial subsequent accounting comments.

Prior research suggests that Big 4 auditors could be preferred in IPOs because they play a more effective “information signaling” role by enhancing the credibility of financial information, allowing companies to better signal their value and reducing the costs faced by underwriters and investors when gathering information about the company. My findings suggest that such *perceived* differences could be grounded in the higher *actual* quality of Big 4 IPO audit services, but I leave an investigation of whether this is the case for future research. Still, I conclude that companies that demand the highest level of audit quality in their IPOs may wish not to seek Second-Tier auditors as a Big 4 alternative.

Prior research also suggests that Big 4 auditors may be preferred in IPOs because they could reduce the risk of litigation against the IPO company or underwriter and because their “deep pockets” allow for greater recovery in the event of litigation (i.e., an “insurance role”). I find no significant association between IPO-related litigation and auditor type. In addition, most cases are settled and average settlement amounts are modest, suggesting that Second-Tier auditors should be able to provide sufficient coverage in the case of litigation.

My results suggest that the benefits of using a Big 4 auditor come at a considerable cost in the form of higher IPO audit fees. The decision to hire a Big 4 auditor ultimately requires an

assessment of the costs and benefits associated with the choice and my study provides evidence that should be useful for those who influence auditor selection.

In addition, regulators have expressed interest in expanding IPO audit market competition. Although I find that Second-Tier auditors provide lower audit quality relative to Big 4 auditors, it is possible that the quality of audit services that they provide is sufficiently high for many companies preparing to IPO, particularly those concerned about the costs associated with going public. As a starting point, regulators interested in promoting IPO audit market competition in the small and mid-sized segment of the IPO audit market can do so by bringing attention to the costs and benefits of using Big 4 auditors. While the audit committees of already-public companies are required to oversee the appointment of the external auditor, IPO auditors are typically selected by management while a company is still private. Evidence suggests that underwriters and other stakeholders can pressure companies into using Big 4 auditors. Therefore, it is possible that the current IPO audit market concentration for small and midcap IPOs does not reflect the true company demand for Second-Tier audit services. Consequently, I reiterate calls for required disclosure of agreements with third parties that restrict IPO auditor choice (ACAP 2008).

I observe that the literature on IPO auditors is limited and that most inferences are drawn from studies using pre-SOX samples. The significant regulatory changes from the passage of SOX and the significant audit market changes from the demise of Arthur Andersen, the exit of smaller auditors from the market (DeFond and Lennox 2011), and the growth of Second-Tier auditors suggest that such inferences may not be generalizable to the post-SOX period. I encourage further research in the IPO audit setting.

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APPENDICES

APPENDIX A
Variable Definitions

| Variable Name | Variable Definition | Source |
|----------------------------------|--|----------------------|
| <i>ABS_DACC_1</i> | The absolute value of pre-IPO discretionary accruals estimated from the performance-adjusted modified Jones model for IPO companies in my sample; | Compustat |
| <i>ABS_DACC_2</i> | The absolute value of pre-IPO discretionary accruals estimated from the performance-adjusted modified Jones model where coefficients are obtained by fitting the model to all available non-IPO companies in Compustat during my sample period with non-missing assets, less than \$1 billion in annual revenues, and that use a Big 4 or Second-Tier auditor; | Compustat |
| <i>ACC_CMTS_1st</i> | The number of Accounting Rule and Disclosure Issue comments in the first SEC comment letter related to the Form S-1 registration statement; | Audit Analytics |
| <i>ACC_CMTS_SUBS</i> | The number of Accounting Rule and Disclosure Issue comments in comment letters subsequent to the first SEC comment letter related to the form S-1 registration statement; | Audit Analytics |
| <i>AGE</i> | The natural log of firm age, calculated as the difference between the year of the IPO and the founding year of the IPO company; | Jay Ritter's Website |
| <i>AUD_CHANGE</i> | 1 if the company switches auditors in the year before the IPO year, and 0 otherwise; | Audit Analytics |
| <i>AUD_FEES</i> | The natural log of audit fees. Audit fees reflect amounts disclosed in the DEF 14A proxy filed after the company goes public; | Audit Analytics |
| <i>BIG_4</i> | 1 if the company is audited by Deloitte, KPMG, Ernst and Young, or PwC, and 0 otherwise; | Audit Analytics |
| <i>CLASS_CMTS_1st</i> | The total number of classification accounting issues raised by the SEC in their initial comment letter related to the registration statement. Issues are identified using Audit Analytics Comment Letters variable <i>ISS_ACCRL_DISC_KEYS</i> . Issues are then categorized as classification issues following Cassell et al. (2013b); | Audit Analytics |
| <i>CORE_CMTS_1st</i> | The total number of non-core accounting issues raised by the SEC in their initial accounting comment letter related to the registration statement. Issues are identified using Audit Analytics Comment Letters variable <i>ISS_ACCRL_DISC_KEYS</i> . Issues | Audit Analytics |

| | | |
|------------------------------------|--|-----------------|
| | are then categorized as non-core issues following Cassell et al. (2013b); | |
| <i>DACC_1</i> | The signed value of pre-IPO discretionary accruals estimated from the performance-adjusted modified Jones model for IPO companies in my sample; | Compustat |
| <i>DACC_2</i> | The signed value of pre-IPO discretionary accruals estimated from the performance-adjusted modified Jones model where coefficients are obtained by fitting the model to all available non-IPO companies in Compustat during my sample period with non-missing assets, less than \$1 billion in annual revenues, and that use a Big 4 or Second-Tier auditor; | Compustat |
| <i>EGC</i> | 1 if the company files an IPO as an Emerging Growth Company under the JOBS Act of 2012, and zero otherwise; | Audit Analytics |
| <i>FOREIGN</i> | 1 if the company has pre-tax foreign income or loss, and 0 otherwise; | Compustat |
| <i>FV_CMTS_1st</i> | The total number of fair value accounting issues raised by the SEC in their initial comment letter related to the registration statement. Issues are identified using Audit Analytics Comment Letters variable <i>ISS_ACCRL_DISC_KEYS</i> . Issues are then categorized as fair value issues following Cassell et al. (2013b); | Audit Analytics |
| <i>GROWTH</i> | The change in revenues as a proportion of prior year assets; | Compustat |
| <i>LEVERAGE</i> | The ratio of total long-term debt to total assets; | Compustat |
| <i>LITIGIOUS</i> | 1 if a company is in a high litigation industry, as those defined by Francis et al. (1994) and used by Kim and Skinner (2012). High-litigation industries include: biotechnology (SIC codes 2833-2836), computers (3570-3577 and 7370-7374), electronics (3600-3674), and retailing (5200-5961); | Compustat |
| <i>LOSS</i> | 1 if the company has negative net income, and 0 otherwise; | Compustat |
| <i>NONCORE_CMTS_1st</i> | The total number of non-core accounting issues raised by the SEC in their initial comment letter related to the registration statement. Issues are identified using Audit Analytics Comment Letters variable <i>ISS_ACCRL_DISC_KEYS</i> . Issues are then categorized as non-core issues following Cassell et al. (2013b); | Audit Analytics |

| | | |
|------------------------|---|------------------------------|
| <i>PCT_RETAINED</i> | The percent of post-IPO shares outstanding retained by pre-IPO shareholders; | SDC |
| <i>PEER_RETURNS</i> | The average buy-and-hold returns for a matched sample of non-IPO companies during the year before the IPO date; | CRSP |
| <i>PEER_SKEWNESS</i> | The average skewness of returns for a matched sample of non-IPO companies during the year before the IPO date; | CRSP |
| <i>PEER_TURNOVER</i> | The average monthly stock turnover for a matched sample of non-IPO companies during the year before the IPO date; | CRSP |
| <i>PEER_VOLATILITY</i> | The average standard deviation of monthly returns for a matched sample of non-IPO companies during the year before the IPO date; | CRSP |
| <i>PRESTIGIOUS_UW</i> | 1 if the IPO is underwritten by a prestigious underwriter, defined as being in the Top 10 Underwriter Rank per Jay Ritter's underwriter ranking, and 0 otherwise; | SDC and Jay Ritter's Website |
| <i>PROCEEDS</i> | The natural log of the total number of shares issued in the IPO multiplied by the IPO offer price in millions; | SDC |
| <i>ROA</i> | Net income scaled by average assets; | Compustat |
| <i>SECOND_TIER</i> | 1 if the IPO auditor is annually inspected by the PCAOB in the year of the IPO. Second-Tier auditors include BDO, Grant Thornton, Marcum (since 2014), RSM (McGladrey before 2015); | Audit Analytics |
| <i>SEGMENTS</i> | The natural log of the number of business and geographic segments; | Compustat |
| <i>SIZE</i> | The natural log of total assets; | Compustat |
| <i>SUED_IPO</i> | 1 if the IPO company was the defendant in a class action lawsuit brought under the Securities Act of 1933, and 0 otherwise; | Audit Analytics |
| <i>TECH</i> | 1 if the IPO company is a technology company based on the Loughran and Ritter (2004) classification; | Compustat |
| <i>VC</i> | 1 if the company received venture backing, and 0 otherwise. | SDC |

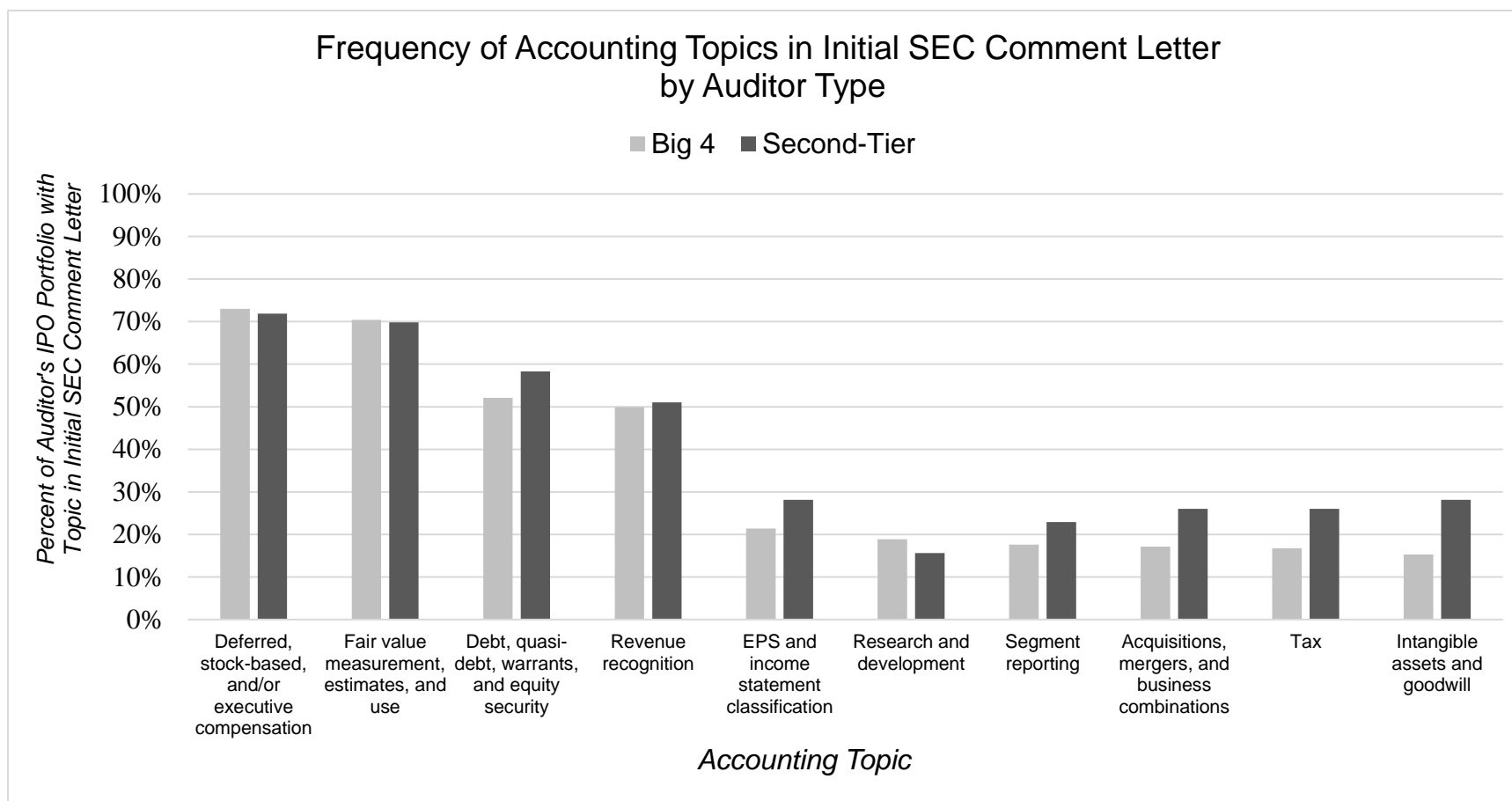


FIGURE 1
Frequency of Accounting Comment Topics in Initial SEC Comment Letter by Auditor Type

This figure presents the frequency of accounting comment topics in initial SEC comment letters issued to IPO companies by auditor type. The percentage of each auditor type’s IPO portfolio with a topic in the initial SEC comment letter is calculated as the total number of IPO clients receiving an initial comment letter on the respective topic divided by the total number of IPO clients in the auditor’s IPO portfolio. An initial accounting comment letter can include multiple accounting comment topics.

TABLE 1
Sample Selection and Composition
Panel A: Sample Selection

| | |
|---|------------|
| U.S. firm-commitment IPOs on major exchanges (NASDAQ, NYSE, AMEX) from January 1, 2005 through December 31, 2019 from the Securities Data Corporation (SDC) New Issues Database | 2,435 |
| <i>Less:</i> | |
| IPO companies that sell securities other than common or Class A shares | (423) |
| IPO companies missing pre-IPO year control variables in Compustat | (553) |
| IPO companies without registration statement financial statement audit opinion data in Audit Analytics | (92) |
| IPO companies without registration statement filing information in WRDS SEC Filings | (163) |
| IPO companies in financial (SIC 60-69) and regulated industries (SIC 40-49), including leveraged buyouts, closed-end funds, open-end funds, trusts, special purpose acquisition companies, and special purpose vehicles | (227) |
| IPO companies with non-Big 4 auditors that are not annually inspected by the PCAOB in the IPO year | (79) |
| IPO companies with revenues greater than \$1 billion in the year before the IPO | (100) |
| IPO companies in SIC2 industries with only one IPO | (10) |
| Total observations for SEC registration statement review tests | 788 |
| Starting sample for discretionary accruals tests | 788 |
| <i>Less IPO Companies:</i> | |
| With assets or revenues less than \$1 million in the pre-IPO year | (167) |
| With assets or revenues less than \$1 million two years before the IPO year | (34) |
| In two-digit SIC industries with fewer than ten IPOs during the sample period | (86) |
| Trim inputs to the performance-adjusted modified Jones model at the 1 st and 99 th percentiles | (39) |
| Total observations for discretionary accruals tests | 462 |

TABLE 1 Continued**Panel B: Frequency of IPOs by IPO Year and Auditor Type**

| IPO Year | Big 4 | Second-Tier | Total | % of IPOs with Big 4 auditor |
|----------|-------|-------------|-------|---------------------------------|
| 2005 | 48 | 3 | 51 | 94.1% |
| 2006 | 55 | 8 | 63 | 87.3% |
| 2007 | 57 | 10 | 67 | 85.1% |
| 2008 | 6 | 2 | 8 | 75.0% |
| 2009 | 19 | 2 | 21 | 90.5% |
| 2010 | 36 | 6 | 42 | 85.7% |
| 2011 | 35 | 5 | 40 | 87.5% |
| 2012 | 40 | 9 | 49 | 81.6% |
| 2013 | 63 | 7 | 70 | 90.0% |
| 2014 | 88 | 12 | 100 | 88.0% |
| 2015 | 55 | 9 | 64 | 85.9% |
| 2016 | 30 | 4 | 34 | 88.2% |
| 2017 | 42 | 8 | 50 | 84.0% |
| 2018 | 67 | 6 | 73 | 91.8% |
| 2019 | 52 | 4 | 56 | 92.9% |
| Total | 693 | 95 | 788 | 87.9% |

Panel C: Frequency of IPO Clients by pre-IPO Year Revenue and Auditor Type

| Pre-IPO year revenues | Big 4 | Second Tier | Total IPOs | % with Big 4 auditor |
|-----------------------|-------|-------------|------------|----------------------|
| < \$100 million | 443 | 59 | 502 | 88.2% |
| \$100 – 500 million | 203 | 29 | 232 | 87.5% |
| \$500 – 1,000 million | 47 | 7 | 54 | 87.0% |
| Total IPOs | 693 | 95 | 788 | 87.9% |

Panel D: Frequency of IPO Clients by Auditor

| Auditor Name | IPO Audit Clients | % of Total IPOs |
|------------------------|-------------------|-----------------|
| Ernst and Young | 309 | 39.2% |
| PricewaterhouseCoopers | 162 | 20.6% |
| Deloitte | 124 | 15.7% |
| KPMG | 98 | 12.4% |
| Grant Thornton | 42 | 5.3% |
| BDO | 31 | 3.9% |
| RSM | 15 | 1.9% |
| Marcum | 7 | 0.9% |
| Total | 788 | 100% |

TABLE 2
Descriptive Statistics
Panel A: Descriptive Statistics for Control Variables by Auditor Type

| Variable | Big 4 (N=693) | | | | Second-Tier (N=95) | | | | Diff. in Means | |
|-----------------------|---------------|--------|--------|---------|--------------------|--------|--------|---------|----------------|--------|
| | Mean | P25 | P50 | P75 | Mean | P25 | P50 | P75 | Diff. | P-val. |
| <i>AGE</i> | 13.225 | 6.000 | 9.000 | 14.000 | 18.284 | 7.000 | 14.000 | 22.000 | -5.059*** | 0.002 |
| <i>AUD_CHANGE</i> | 0.032 | 0.000 | 0.000 | 0.000 | 0.084 | 0.000 | 0.000 | 0.000 | -0.052** | 0.012 |
| <i>EGC</i> | 0.597 | 0.000 | 1.000 | 1.000 | 0.537 | 0.000 | 1.000 | 1.000 | 0.061 | 0.261 |
| <i>FOREIGN</i> | 0.371 | 0.000 | 0.000 | 1.000 | 0.168 | 0.000 | 0.000 | 0.000 | 0.202*** | 0.000 |
| <i>GROWTH</i> | 0.397 | 0.001 | 0.192 | 0.596 | 0.299 | 0.017 | 0.170 | 0.481 | 0.097 | 0.110 |
| <i>LEVERAGE</i> | 0.213 | 0.000 | 0.051 | 0.278 | 0.371 | 0.000 | 0.200 | 0.641 | -0.158*** | 0.001 |
| <i>LITIGIOUS</i> | 0.765 | 1.000 | 1.000 | 1.000 | 0.547 | 0.000 | 1.000 | 1.000 | 0.217*** | 0.000 |
| <i>LOSS</i> | 0.716 | 0.000 | 1.000 | 1.000 | 0.579 | 0.000 | 1.000 | 1.000 | 0.137*** | 0.006 |
| <i>PCT_RETAINED</i> | 0.754 | 0.697 | 0.768 | 0.832 | 0.749 | 0.664 | 0.749 | 0.837 | 0.005 | 0.720 |
| <i>PRESTIGIOUS_UW</i> | 0.743 | 0.000 | 1.000 | 1.000 | 0.442 | 0.000 | 0.000 | 1.000 | 0.301*** | 0.000 |
| <i>PROCEEDS</i> | 138.502 | 68.200 | 96.000 | 151.300 | 121.340 | 49.200 | 75.000 | 132.000 | 17.162 | 0.275 |
| <i>ROA</i> | -0.450 | -0.676 | -0.234 | 0.017 | -0.621 | -0.596 | -0.040 | 0.041 | 0.170* | 0.076 |
| <i>REVENUES</i> | 133.683 | 3.598 | 58.698 | 167.312 | 142.155 | 4.302 | 52.897 | 203.117 | -8.471 | 0.694 |
| <i>SEGMENTS</i> | 3.009 | 2.000 | 2.000 | 4.000 | 2.663 | 2.000 | 2.000 | 3.000 | 0.346** | 0.048 |
| <i>SIZE</i> | 202.076 | 37.641 | 72.313 | 191.143 | 217.461 | 19.236 | 61.212 | 277.204 | -15.385 | 0.685 |
| <i>TECH</i> | 0.229 | 0.000 | 0.000 | 0.000 | 0.189 | 0.000 | 0.000 | 1.000 | 0.040 | 0.382 |
| <i>VC</i> | 0.724 | 0.000 | 1.000 | 1.000 | 0.453 | 0.000 | 0.000 | 1.000 | 0.272*** | 0.000 |

This table presents descriptive statistics for the control variables in my sample. Descriptive statistics for *AGE*, *PROCEEDS*, *SEGMENTS*, and *SIZE* are before the logarithmic transformation. Big 4 auditors include Deloitte, EY, KPMG, and PwC. Second-Tier auditors are non-Big 4 auditors that are annually inspected by the PCAOB in the year of the IPO and include BDO, Grant Thornton, Marcum (since 2014), and RSM (McGladrey before 2015). The *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels. All variables are defined in Appendix A.

TABLE 2 Continued**Panel B: Descriptive Statistics for Dependent Variables by Auditor Type**

| Variables | Big 4 | | | | Second-Tier | | | | Diff. in Means | | Diff. in Medians | |
|--------------------------------|-------|--------|-------|-------|-------------|-------|-------|-------|----------------|--------|------------------|--------|
| | N | Mean | P50 | SD | N | Mean | P50 | SD | Diff. | P-val. | Diff. | P-val. |
| <i>Accrual Measures</i> | | | | | | | | | | | | |
| <i>ABS_DACC_1</i> | 419 | 0.159 | 0.099 | 0.186 | 43 | 0.194 | 0.098 | 0.224 | -0.035 | 0.252 | 0.001 | 0.873 |
| <i>ABS_DACC_2</i> | 419 | 0.167 | 0.102 | 0.206 | 43 | 0.175 | 0.105 | 0.186 | -0.008 | 0.802 | -0.003 | 0.873 |
| <i>DACC_1</i> | 419 | -0.014 | 0.004 | 0.245 | 43 | 0.091 | 0.058 | 0.283 | -0.105*** | 0.009 | -0.054** | 0.016 |
| <i>DACC_2</i> | 419 | -0.040 | 0.001 | 0.262 | 43 | 0.084 | 0.074 | 0.241 | -0.125*** | 0.003 | -0.083*** | 0.002 |
| <i>SEC Review Measures</i> | | | | | | | | | | | | |
| <i>ACC_CMTS_1st</i> | 693 | 4.850 | 4.000 | 3.313 | 95 | 5.737 | 5.000 | 3.725 | -0.887** | 0.016 | -1.000** | 0.029 |
| <i>ACC_CMTS_SUBS</i> | 693 | 3.945 | 2.000 | 4.846 | 95 | 5.211 | 3.000 | 6.028 | -1.265** | 0.021 | -1.000 | 0.329 |

This table presents descriptive statistics for dependent variables in my sample. The full sample includes 788 IPOs, where 693 IPOs use a Big 4 auditor and 95 IPOs use a Second-Tier auditor. The descriptive presented for the discretionary accrual measures are for a sample of 501 IPOs, where 447 IPOs use a Big 4 auditor and 54 IPOs use a Second-Tier auditor. The accruals sample is smaller due to additional data requirements for the estimation of total accruals, as shown in Table 1 Panel A. Big 4 auditors include Deloitte, EY, KPMG, and PwC. Second Tier auditors are non-Big 4 auditors that are annually inspected by the PCAOB in the year of the IPO and include BDO, Grant Thornton, Marcum (since 2014), and RSM (McGladrey before 2015). The *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels. All variables are defined in Appendix A.

TABLE 3
Pre-IPO Discretionary Accruals and the Use of a Big 4 Auditor

| Variables | (1) | | (2) | | (3) | | (4) | |
|-----------------------|-------------------|--------|-------------------|--------|---------------|--------|---------------|--------|
| | <i>ABS_DACC_1</i> | | <i>ABS_DACC_2</i> | | <i>DACC_1</i> | | <i>DACC_2</i> | |
| | Coef. | P-val. | Coef. | P-val. | Coef. | P-val. | Coef. | P-val. |
| <i>BIG_4</i> | -0.058* | 0.026 | -0.032* | 0.094 | -0.103*** | 0.009 | -0.096*** | 0.009 |
| <i>AGE</i> | -0.018 | 0.368 | -0.011 | 0.599 | -0.025 | 0.365 | -0.032 | 0.227 |
| <i>AUD_CHANGE</i> | 0.128** | 0.044 | 0.172** | 0.027 | -0.147 | 0.126 | -0.152 | 0.143 |
| <i>EGC</i> | -0.038 | 0.221 | 0.004 | 0.894 | -0.063 | 0.229 | -0.094* | 0.051 |
| <i>FOREIGN</i> | -0.028 | 0.155 | -0.027 | 0.214 | 0.012 | 0.676 | 0.018 | 0.550 |
| <i>GROWTH</i> | 0.145*** | 0.000 | 0.161*** | 0.000 | 0.011 | 0.796 | -0.082* | 0.080 |
| <i>LEVERAGE</i> | 0.012 | 0.729 | -0.008 | 0.814 | -0.050 | 0.301 | -0.048 | 0.288 |
| <i>LITIGIOUS</i> | -0.067 | 0.223 | -0.029 | 0.625 | 0.074 | 0.300 | 0.056 | 0.406 |
| <i>LOSS</i> | -0.026 | 0.270 | -0.043* | 0.093 | -0.006 | 0.855 | -0.017 | 0.631 |
| <i>PCT_RETAINED</i> | -0.009 | 0.898 | -0.022 | 0.779 | -0.179** | 0.022 | -0.210** | 0.012 |
| <i>PRESTIGIOUS_UW</i> | -0.001 | 0.967 | -0.013 | 0.593 | 0.015 | 0.657 | 0.012 | 0.734 |
| <i>PROCEEDS</i> | -0.034* | 0.076 | -0.023 | 0.258 | -0.036 | 0.196 | -0.016 | 0.565 |
| <i>ROA</i> | -0.144** | 0.011 | -0.199*** | 0.002 | 0.238*** | 0.001 | 0.307*** | 0.000 |
| <i>SEGMENTS</i> | -0.004 | 0.867 | -0.003 | 0.895 | -0.034 | 0.322 | -0.039 | 0.244 |
| <i>SIZE</i> | 0.017 | 0.162 | 0.020 | 0.137 | -0.005 | 0.775 | -0.027 | 0.164 |
| <i>TECH</i> | 0.021 | 0.384 | 0.029 | 0.232 | -0.040 | 0.213 | -0.026 | 0.404 |
| <i>VC</i> | 0.009 | 0.674 | -0.006 | 0.829 | 0.006 | 0.837 | 0.008 | 0.800 |
| Observations | 462 | | 462 | | 462 | | 462 | |
| Adj. R ² | 0.254 | | 0.266 | | 0.112 | | 0.179 | |
| Industry FE | YES | | YES | | YES | | YES | |
| Year FE | YES | | YES | | YES | | YES | |

This table presents linear regressions of pre-IPO discretionary accruals and the use of a Big 4 auditor. *ABS_DACC_1* (*DACC_1*) is the absolute (signed) value of discretionary accruals and expected accruals are estimated using the performance-adjusted modified Jones model for IPO companies in my sample. *ABS_DACC_2* (*DACC_2*) is the absolute (signed) value of discretionary accruals and expected accruals are estimated by fitting the modified Jones performance-adjusted model to all available non-IPO companies in Compustat during my sample period with non-missing assets, less than \$1 billion in annual revenues, and that use a Big 4 or Second-Tier auditor. I then apply the saved coefficients to IPO company data. The *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels using one tailed p-values for the variable of interest and two-tailed p-values for all other variables and are derived from test statistics based on robust standard errors. All variables are defined in Appendix A.

TABLE 4**SEC Accounting Comments and the Use of a Big 4 Auditor**

| Variables | (1) | | (2) | |
|--|--------------------------------|--------|----------------------|--------|
| | <i>ACC_CMTS_1st</i> | | <i>ACC_CMTS_SUBS</i> | |
| | Coef. | P-val. | Coef. | P-val. |
| <i>BIG_4</i> | -0.913*** | 0.006 | 0.939 | 0.102 |
| <i>ACC_CMTS_1st</i> | | | 1.078*** | 0.000 |
| <i>BIG_4 x ACC_CMTS_1st</i> | | | -0.237* | 0.067 |
| <i>AGE</i> | -0.323 | 0.157 | -0.370 | 0.209 |
| <i>AUD_CHANGE</i> | 0.102 | 0.858 | -0.031 | 0.960 |
| <i>EGC</i> | 0.039 | 0.954 | 0.682 | 0.389 |
| <i>FOREIGN</i> | 0.158 | 0.534 | -0.475 | 0.224 |
| <i>GROWTH</i> | 0.175 | 0.393 | -0.040 | 0.892 |
| <i>LEVERAGE</i> | 0.189 | 0.495 | 0.345 | 0.305 |
| <i>LITIGIOUS</i> | 0.672 | 0.257 | 1.695** | 0.044 |
| <i>LOSS</i> | -0.643* | 0.050 | -0.467 | 0.367 |
| <i>PCT_RETAINED</i> | -1.217 | 0.197 | -1.939 | 0.125 |
| <i>PRESTIGIOUS_UW</i> | -0.265 | 0.304 | -0.335 | 0.400 |
| <i>PROCEEDS</i> | -0.308 | 0.166 | 0.105 | 0.758 |
| <i>ROA</i> | -0.021 | 0.884 | -0.029 | 0.897 |
| <i>SEGMENTS</i> | 0.854** | 0.015 | -0.310 | 0.522 |
| <i>SIZE</i> | 0.488*** | 0.001 | 0.009 | 0.976 |
| <i>TECH</i> | -0.190 | 0.605 | -0.891 | 0.174 |
| <i>VC</i> | -0.184 | 0.533 | 0.225 | 0.654 |
| <i>BIG_4 +</i> <i>BIG_4 x ACC_CMTS_1st</i> | | | 1.300 | 0.255 |
| <i>ACC_CMTS_1st +</i> <i>BIG_4 x ACC_CMTS_1st</i> | | | 84.450*** | 0.000 |
| Observations | 788 | | 788 | |
| Adj. R ² | 0.376 | | 0.421 | |
| Industry FE | YES | | YES | |
| Year FE | YES | | YES | |

This table presents linear regressions of the association between the number of accounting comments in SEC comment letters related to the Form S-1 registration statement and the use of a Big 4 auditor. In Column (1), *ACC_CMTS_1st* is the number of accounting comments in the initial SEC comment letter. In Columns (2), *ACC_CMTS_SUBS* is the number of accounting comments in subsequent SEC comment letters. The *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels using one tailed p-values for the variable of interest and two-tailed p-values for all other variables and are derived from test statistics based on robust standard errors. All variables are defined in Appendix A.

TABLE 5**Accounting Topics in Initial SEC Comment Letters****Panel A: Frequency of Accounting Topics in Initial SEC Comment Letters by Auditor Type**

| <i>Big 4 IPO Clients (N=693)</i> | | | | |
|---------------------------------------|--|----------------------------|--------------|----------------|
| (1) | (2) | (3) | (4) | (5) |
| Rank | Accounting Issue Topic | Num. of Clients with Issue | % of Clients | Issue Category |
| 1 | Deferred, stock-based, and/or executive compensation | 506 | 73.02% | Non-Core |
| 2 | Fair value measurement, estimates, and use | 488 | 70.42% | Fair Value |
| 3 | Debt, quasi-debt, warrants, and equity security | 361 | 52.09% | Non-Core |
| 4 | Revenue recognition | 346 | 49.93% | Core |
| 5 | EPS and income statement classification | 148 | 21.36% | Classification |
| 6 | Research and development | 131 | 18.90% | Core |
| 7 | Segment reporting | 122 | 17.60% | Classification |
| 8 | Acquisitions, mergers, and business combinations | 119 | 17.17% | Non-Core |
| 9 | Tax | 116 | 16.74% | Non-Core |
| 10 | Intangible assets and goodwill | 106 | 15.30% | Non-Core |
| 11 | Inventory, vendor, and/or cost of sales | 98 | 14.14% | Core |
| 12 | Contingencies and commitments | 98 | 14.14% | Non-Core |
| 13 | Liabilities, payables, and accrual estimates | 96 | 13.85% | Core |
| 14 | Accounts receivable and cash reporting | 69 | 9.96% | Core |
| 15 | Expenses | 62 | 8.95% | Core |
| <i>Second-Tier IPO Clients (N=95)</i> | | | | |
| (1) | (2) | (3) | (4) | (5) |
| Rank | Accounting Issue Topic | Num. of Clients with Issue | % of Clients | Issue Category |
| 1 | Deferred, stock-based, and/or executive compensation | 69 | 71.9% | Non-Core |
| 2 | Fair value measurement, estimates, and use | 67 | 69.8% | Fair Value |
| 3 | Debt, quasi-debt, warrants, and equity security | 56 | 58.3% | Non-Core |
| 4 | Revenue recognition | 49 | 51.0% | Core |
| 5 | EPS and income statement classification | 27 | 28.1% | Classification |
| 6 | Intangible assets and goodwill | 27 | 28.1% | Non-Core |

TABLE 5 Continued

| | | | | |
|----|--|----|-------|----------------|
| 7 | Acquisitions, mergers, and business combinations | 25 | 26.0% | Non-Core |
| 8 | Tax | 25 | 26.0% | Non-Core |
| 9 | Segment reporting | 22 | 22.9% | Classification |
| 10 | Inventory, vendor, and/or cost of sales | 19 | 19.8% | Core |
| 11 | Contingencies and commitments | 19 | 19.8% | Non-Core |
| 12 | Fixed Assets | 17 | 17.7% | Non-Core |
| 13 | Accounts receivable and cash reporting | 16 | 16.7% | Core |
| 14 | Research and Development | 15 | 15.6% | Core |
| 15 | Liabilities, payables, and accrual estimate issues | 15 | 15.6% | Core |

This table presents the fifteen most common accounting issues identified in initial SEC comment letters related to the Form S-1 registration statement for Big 4 and Second-Tier IPO audit clients. Of the 693 (95) Big 4 (Second-Tier) observations in my sample, 630 (89) receive at least one initial accounting comment. Of the observations with at least one initial accounting comment, I identify the issue topic(s) that each initial accounting comment relates to by using Audit Analytics. Columns (1) and (2) present the rank of the most frequently occurring issue topics for IPO clients of Big 4 and Second-Tier auditors. Column (3) presents the number of IPOs with the respective issue. Column (4) presents the percent of clients in the auditor's IPO portfolio with the respective issue. See Figure 1 for a visual representation. In Column (5), issue topics are further categorized as either Core, Non-Core, Classification, or Fair Value issues following Cassell et al. (2013b).

Panel B: Accounting Topic Categories in Initial SEC Comment Letters by Auditor Type

| Variables | Big 4 (N = 693) | | Second-Tier (N = 95) | | Diff. in Means | |
|-------------------------|--------------------|-------|-------------------------|-------|----------------|--------|
| | Mean | P50 | Mean | P50 | Diff. | P-val. |
| <i>ACC_CMTS_1st</i> | 4.850 | 3.313 | 5.737 | 3.725 | -0.887** | 0.016 |
| <i>CORE_CMTS_1st</i> | 1.310 | 1.332 | 1.463 | 1.479 | -0.153 | 0.301 |
| <i>NONCORE_CMTS_1st</i> | 2.335 | 1.855 | 3.063 | 2.163 | -0.728*** | 0.001 |
| <i>CLASS_CMTS_1st</i> | 0.512 | 0.752 | 0.600 | 0.817 | -0.088 | 0.292 |
| <i>FV_CMTS_1st</i> | 0.704 | 0.457 | 0.653 | 0.479 | 0.052 | 0.305 |

This table presents descriptive statistics for initial SEC accounting comment issue categories by auditor type. Topic categories follow Cassell et al. (2013b). The descriptive statistics in this table are calculated for all observations in my sample. The *,**,*** indicate statistical significance at the 0.10, 0.05, and 0.01 levels. All variables are defined in Appendix A.

TABLE 6
Entropy Balancing

| Outcomes | Var. of Interest | (1) Before Entropy Balancing | | (2) After Entropy Balancing | |
|--------------------------------|---|------------------------------------|--------|-----------------------------------|--------|
| | | Coef. | P-val. | Coeff | P-val. |
| <u><i>Disc. Accruals</i></u> | | | | | |
| <i>ABS_DACC_1</i> | <i>BIG_4</i> | -0.058** | 0.026 | -0.063** | 0.011 |
| <i>ABS_DACC_2</i> | <i>BIG_4</i> | -0.032* | 0.094 | -0.048** | 0.012 |
| <i>DACC_1</i> | <i>BIG_4</i> | -0.103*** | 0.009 | -0.142*** | 0.000 |
| <i>DACC_2</i> | <i>BIG_4</i> | -0.096*** | 0.009 | -0.162*** | 0.000 |
| <u><i>Acct. Comments</i></u> | | | | | |
| <i>ACC_CMTS_1ST</i> | <i>BIG_4</i> | -0.913*** | 0.006 | -0.537* | 0.058 |
| <i>ACCT_CMTS_SUBS</i> | <i>BIG_4</i> x <i>ACCT_CMTS_1st</i> | -0.237* | 0.067 | -0.307** | 0.019 |
| Controls | | YES | | YES | |
| Industry FEs | | YES | | YES | |
| Year FEs | | YES | | YES | |

This table presents the sign, magnitude, and statistical significance of the coefficient for the variable of interest in the main tests of my study before and after the use of entropy-balancing (Heinmuller 2012). When using entropy-balancing, I achieve balanced covariates along the first and second moment for all regressors in my models. Column (1) presents information on coefficients before entropy balancing. Column (2) presents information on coefficients after entropy balancing. The *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels using one tailed p-values for the variable of interest and two-tailed p-values for all other variables and are derived from test statistics based on robust standard errors. All variables are defined in Appendix A.

TABLE 7
Litigation Risk and Litigation Outcomes
Panel A: Ex-Ante Litigation Risk and the Use of a Big 4 Auditor

| | Big 4 | Second-Tier | Diff. in Means | |
|---|---------|-------------|----------------|--------|
| | (N=693) | (N=95) | Diff. | P-val. |
| | Mean | Mean | | |
| <i>Ex-Ante Litigation Risk Measures</i> | | | | |
| <i>GROWTH</i> | 0.397 | 0.299 | 0.097 | 0.110 |
| <i>LITIGIOUS</i> | 0.765 | 0.547 | 0.217*** | 0.000 |
| <i>PEER_RETURNS</i> | 0.227 | 0.196 | 0.031 | 0.669 |
| <i>PEER_SKEWNESS</i> | 0.311 | 0.311 | 0.000 | 0.995 |
| <i>PEER_TURNOVER</i> | 2.245 | 1.814 | 0.431*** | 0.000 |
| <i>PEER_VOLATILITY</i> | 0.151 | 0.145 | 0.006 | 0.254 |
| <i>PROCEEDS</i> | 138.502 | 121.340 | 17.162 | 0.275 |
| <i>SIZE</i> | 202.076 | 217.461 | -15.385 | 0.685 |

This table presents descriptive statistics for several ex-ante litigation risk measures by auditor type. Variables that begin with 'PEER_' are calculated for a matched sample of non-IPO companies during the twelve months before the IPO date. The matched sample consists of companies in the same three-digit SIC code as the IPO company with market capitalization within 80–120% of the IPO company market value at the close of the first day of trading (Lowry and Shu 2002). *PEER_RETURNS* is the average peer annual buy-and-hold returns in the year before the IPO date. *PEER_SKEWNESS* is the average peer skewness of returns during the year before the IPO date. *PEER_TURNOVER* is the average peer monthly stock turnover during the year before the IPO date. *PEER_VOLATILITY* is the average peer standard deviation of monthly returns during the year before the IPO date. All variables are defined in Appendix A.

TABLE 7 Continued
Panel B: Litigation Outcomes and the Use of a Big 4 Auditor

| | (1) | | (2) | | (3) | | (4) | |
|------------------------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|
| | <i>SUED_IPO</i> | | <i>SUED_IPO</i> | | <i>SUED_IPO</i> | | <i>SUED_IPO</i> | |
| | Coef. | P-val. | Coef. | P-val. | Coef. | P-val. | Coef. | P-val. |
| <i>BIG_4</i> | -0.233 | 0.589 | -0.303 | 0.485 | 0.168 | 0.760 | 0.170 | 0.760 |
| <i>GROWTH</i> | 0.274 | 0.349 | 0.223 | 0.475 | 0.125 | 0.749 | 0.119 | 0.762 |
| <i>LITIGATE</i> | -0.061 | 0.932 | -0.207 | 0.779 | 0.239 | 0.802 | 0.250 | 0.791 |
| <i>SIZE</i> | 0.187 | 0.145 | 0.247* | 0.079 | 0.389** | 0.018 | 0.389** | 0.017 |
| <i>PRESTIGE_UW</i> | | | -0.107 | 0.788 | 0.382 | 0.421 | 0.376 | 0.427 |
| <i>VC</i> | | | 0.494 | 0.241 | 0.330 | 0.460 | 0.306 | 0.500 |
| <i>PEER_TURNOVER</i> | | | | | -0.148 | 0.408 | -0.133 | 0.472 |
| <i>PEER_VOLATILITY</i> | | | | | 9.085* | 0.091 | 8.596 | 0.165 |
| <i>PEER_RETURN</i> | | | | | | | 0.015 | 0.959 |
| <i>PEER_SKEWNESS</i> | | | | | | | -0.027 | 0.971 |
| Observations | 719 | | 719 | | 660 | | 660 | |
| AUC | 0.743 | | 0.746 | | 0.757 | | 0.758 | |
| Pseudo R2 | 0.115 | | 0.118 | | 0.138 | | 0.138 | |
| Industry FE | YES | | YES | | YES | | YES | |
| Year FE | YES | | YES | | YES | | YES | |

This table presents logistic regressions of the association between the filing of a class action lawsuit against an IPO company under the Securities Act of 1933 (i.e., IPO lawsuit) and the use of a Big 4 auditor. I use the Audit Analytics Legal database to obtain this data. *SUED_IPO* is an indicator set to one if the IPO company was the defendant in an IPO lawsuit. In Columns (1) and (2), the sample size is reduced from my full sample of 788 observations because some 2-digit SIC industries have no IPO lawsuits. In Columns (3) and (4), the sample size is further reduced because I was unable to identify peer(s) for the IPO company given peer requirements. The *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels using two-tailed p-values and are derived from test statistics based on robust standard errors. All variables are defined in Appendix A.

TABLE 7 Continued
Panel C: Frequency of IPO Lawsuits Filed by Auditor Type

| Defendant | Big 4 IPO Client Sued | Second-Tier IPO Client Sued | Diff. in Means | P-val. |
|------------------------|--------------------------|--------------------------------|-------------------|--------|
| IPO Client Only | 6.78% (47/693) | 8.40% (8/95) | -0.016 | 0.557 |
| IPO Client and Auditor | 0.87% (6/695) | 0.00% (0/95) | 0.009*** | 0.009 |
| Total IPO Clients | 7.65% (53/693) | 8.40% (8/95) | -0.008 | 0.557 |

This table presents the frequency with which IPO clients and their auditors are sued in relation to an IPO by auditor type. Lawsuits are securities class action claims brought under the Securities Act of 1933.

Panel D: Descriptive Statistics for IPO Lawsuit Outcomes by Auditor Type

| | Big 4 IPO Clients | Second-Tier IPO Clients |
|------------------------------------|-------------------|-------------------------|
| Clients | 693 | 95 |
| <i>Outcomes of Lawsuit Filings</i> | | |
| IPO Lawsuits | 47 | 8 |
| Percent Settled | 51.06 % | 50.00 % |
| Percent Dismissed | 25.54 % | 37.50 % |
| Percent Ongoing | 10.60 % | 0.00 % |
| Percent For Defendant | 0.00 % | 12.5 % |
| Percent Other | 12.80 % | 0.00 % |
| <i>Settlement Information</i> | | |
| Settlement Amount | 7.04 | 4.69 |
| Assets (Pre-IPO Year) | 151.32 | 288.43 |
| Settlement / Assets | 4.65 % | 1.60 % |
| Revenues (Pre-IPO Year) | 165.50 | 247.03 |
| Settlement / Revenues | 4.25 % | 1.90 % |
| IPO Proceeds | 129.40 | 100.33 |
| Settlement / Proceeds | 5.44 % | 4.67 % |

This table presents descriptive statistics on litigation outcomes and settlement amounts for securities class action claims against IPO companies in my sample brought under the Securities Act of 1933 by auditor type. I use the Audit Analytics Legal database to obtain this data. Averages (in millions) are presented for the settlement, revenues, and proceeds of the sued IPO company. Settlement amounts for Big 4 IPO client amounts exclude the settlement of Snap Inc.'s because it is an outlier. Snap Inc settled a class action alleging the company and its executives used faulty growth metrics ahead of its 2017 IPO for \$155 million. The settlement amount is over 20 times larger than the average of other Big 4 settlement amounts. The company's auditor (EY) was not named in the lawsuit.

TABLE 8**IPO Audit Fees and the Use of a Big 4 Auditor****Panel A: Descriptive Statistics for Audit Fees in the Pre-IPO Year and IPO Year by Auditor Type (N=788)**

| Variable | Mean | Big 4 (N=693) | | | Second-Tier (N=95) | | | | Diff. in Means | |
|-----------------------------|----------|---------------|----------|----------|--------------------|--------|--------|----------|----------------|--------|
| | | P25 | P50 | P75 | Mean | P25 | P50 | P75 | Diff. | P-val. |
| <i>Pre-IPO Year</i> | | | | | | | | | | |
| <i>AUD_FEES</i> | 781.91 | 227.00 | 572.50 | 1,100.00 | 474.65 | 145.00 | 267.74 | 586.14 | 307.26*** | 0.001 |
| <i>IPO Year</i> | | | | | | | | | | |
| <i>AUD_FEES</i> | 1,291.05 | 709.10 | 1,106.24 | 1,671.09 | 666.04 | 277.78 | 551.99 | 926.06 | 642.60*** | 0.000 |
| <i>Pre-IPO and IPO Year</i> | | | | | | | | | | |
| <i>AUD_FEES</i> | 2,072.96 | 1,170.02 | 1,824.38 | 2,588.00 | 1,140.67 | 460.15 | 906.16 | 1,431.91 | 932.27*** | 0.000 |

This table presents descriptive statistics for audit fees charged to IPO clients in my sample. *AUD_FEES* is audit fees (in thousands) and reflects amounts disclosed in the DEF 14A proxy statement filed after the company becomes public. I obtain audit fee data primarily from Audit Analytics, hand collecting from DEF 14A filings where data is missing. Big 4 auditors include Deloitte, EY, KPMG, and PwC. Second-Tier auditors are non-Big 4 auditors that are annually inspected by the PCAOB in the year of the IPO and include BDO, Grant Thornton, Marcum (since 2014), and RSM (McGladrey before 2015). The *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels. All variables are defined in Appendix A.

TABLE 8 Continued

Panel B: The Association between Audit Fees and the use of a Big 4 Auditor

| Year | (1) Pre-IPO Year <i>AUD_FEES</i> | | (2) IPO Year <i>AUD_FEES</i> | | (3) Pre-IPO and IPO Year <i>AUD_FEES</i> | |
|-----------------------|--|--------|------------------------------------|--------|--|--------|
| Variables | Coef. | P-val. | Coef. | P-val. | Coef. | P-val. |
| <i>BIG_4</i> | 0.373*** | 0.002 | 0.506*** | 0.000 | 0.489*** | 0.000 |
| <i>AGE</i> | 0.064 | 0.387 | -0.039 | 0.334 | -0.035 | 0.412 |
| <i>AUD_CHANGE</i> | -0.178 | 0.280 | | | -0.020 | 0.834 |
| <i>EGC</i> | -0.346** | 0.038 | 0.186 | 0.102 | 0.036 | 0.749 |
| <i>FOREIGN</i> | 0.329*** | 0.004 | 0.088* | 0.089 | 0.112** | 0.022 |
| <i>GROWTH</i> | 0.219** | 0.016 | 0.092** | 0.024 | 0.063 | 0.303 |
| <i>LEVERAGE</i> | 0.246** | 0.018 | 0.186 | 0.206 | 0.090 | 0.128 |
| <i>LITIGIOUS</i> | 0.063 | 0.705 | -0.059 | 0.591 | -0.017 | 0.871 |
| <i>LOSS</i> | 0.166 | 0.240 | 0.235*** | 0.000 | 0.147*** | 0.009 |
| <i>PCT_RETAINED</i> | -0.509* | 0.094 | 0.161 | 0.119 | -0.016 | 0.930 |
| <i>PRESTIGIOUS_UW</i> | -0.035 | 0.730 | 0.092 | 0.107 | 0.054 | 0.302 |
| <i>PROCEEDS</i> | -0.014 | 0.862 | 0.006 | 0.924 | 0.028 | 0.586 |
| <i>ROA</i> | -0.162** | 0.015 | 0.105 | 0.134 | -0.020 | 0.136 |
| <i>SEGMENTS</i> | 0.242* | 0.060 | 0.070 | 0.128 | 0.232** | 0.015 |
| <i>SIZE</i> | 0.353*** | 0.000 | 0.305*** | 0.000 | 0.273*** | 0.000 |
| <i>TECH</i> | -0.223* | 0.084 | 0.003 | 0.968 | -0.084 | 0.198 |
| <i>VC</i> | -0.009 | 0.940 | 0.072 | 0.213 | 0.078 | 0.158 |
| Observations | 788 | | 788 | | 788 | |
| Adj. R2 | 0.338 | | 0.515 | | 0.548 | |
| Industry FE | YES | | YES | | YES | |
| Year FE | YES | | YES | | YES | |

This table presents linear regressions of the association between audit fees and the use of a Big 4 auditor. *AUD_FEES* is audit fees and reflects fee amounts disclosed in the DEF 14A filed after the company goes public. In Column (1), *AUD_FEES* includes pre-IPO year audit fees and control variables are as of the pre-IPO year. In Column (2), *AUD_FEES* includes IPO year audit fees and control variables are as of the IPO year. In Column (3), *AUD_FEES* includes the sum of pre-IPO year and IPO year audit fees and control variables that vary year-over-year are averaged across the pre- and IPO- year. The *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels. All variables are defined in Appendix A.

VITA

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Upon graduation, he obtained his CPA license and worked for several years in the audit practice of Deloitte in Cincinnati, OH before entering the Accounting PhD program at the University of Tennessee. At the University of Tennessee, Stefan taught undergraduate auditing. His research interests are in auditing, financial reporting, and corporate governance. Stefan will begin his career at San Diego State University in the fall of 2022.