The Landscape of Auditing in U.S. Capital Markets*

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Abstract

We document trends in landscape of public-company auditing over 2003 to 2023, focusing on the distribution of audits across auditor size groups, auditor switching patterns, and audit firm entry and exit. We find remarkable stability in the Big 4's proportion of total audit fees but substantial declines in their presence among Nasdaq and OTC issuers. Auditor switching rates decline over time among Big 4 and Mid 2 clients while remaining persistently high among clients of smaller audit firms, suggesting increased differentiation in auditor-client relationships. Although PCAOB registrations surge in the first half of our sample, largely due to the 2009 broker-dealer mandate, total registered firms decline sharply after 2010. Most deregistering firms were minimally involved in auditing public issuers, suggesting that their exit does not necessarily reduce auditor availability. Our results highlight the importance of understanding firm-level audit activity, rather than registration numbers alone, when evaluating regulatory impacts on public issuer audits.

Keywords: Audit market, PCAOB, Auditor switching, Audit regulation, Auditor competition, Audit fees, Sarbanes-Oxley Act

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1 Introduction

Regulatory interventions in capital markets often follow corporate scandals (Hail et al., 2018). In response to the Enron scandal, Congress enacted the Sarbanes-Oxley Act (SOX) in 2002 with the objective of restoring trust in capital markets. A key aspect of this regulation is the establishment of the Public Company Accounting Oversight Board (PCAOB), which sets and amends auditing standards for public company audits and conducts inspections to ensure registered audit firms comply with these standards. Recently, however, market participants are questioning whether updates to audit standards provide clear benefits to capital markets or disproportionately increasing costs, especially for mid-size and smaller audit firms.[1] There is an overarching concern that excessive regulation could harm capital markets by prompting audit firms to exit the public issuer market or by discouraging new entrants.

A robust policy debate on the impact of audit regulation requires a foundation of commonly agreed-upon facts (Leuz, 2018). Thus, in this paper, we present a series of stylized facts documenting changes in the dynamics of auditing in public capital markets since the establishment of the PCAOB. We focus specifically on aggregate trends in structure, as well as firm-level patterns in entry, exit, and activity in the universe of audit firms serving public issuers registered with the U.S. Securities and Exchange Commission (SEC).[2]

Our first objective is to provide a macro-level view of trends in the structure of auditing for U.S. publicly traded companies over the past two decades. Specifically, we focus on a sample of U.S.-based issuers (i.e., those with a business address in the U.S.) registered with the SEC, utilizing audit opinion data from Audit Analytics covering the period 2003 to 2023. Initially, we analyze the share of public issuer audits for the largest audit firms by examining the proportion of total audit fees earned by Big 4 audit firms (e.g., Simunic, 1980).[3] Our analysis reveals remarkable stability

[1] The Center for Audit Quality urged the PCAOB to ease the regulatory burden on small audit firms (Center for Audit Quality's Small Firm Task Force, 2024).

[2] Note that our goal is not to provide a detailed literature review about existing academic findings on these topics but rather to provide useful stylized facts spanning multiple decades. For useful reviews about the audit literature related to our study, see notably Hay et al. (2006), Causholli et al. (2010), and DeFond and Zhang (2014). See also the relevant discussion in Eshleman and Lawson (2017).

[3] The Big 4 audit firms are Deloitte, Ernst & Young (EY), PricewaterhouseCoopers (PwC), and KPMG.

in the share of the audit fees earned by Big 4, with these firms accounting for between 91% to 95% of total audit fees throughout our sample period. The remainder of the fees earned is divided approximately evenly between the Mid 2 audit firms (Grant Thornton and BDO) and a diverse set of smaller and mid-size audit firms registered with the PCAOB. Interestingly, when we measure the share of public issuer audits by the number of issuers audited rather than fees, the Big 4's share is substantially lower (around 50% to 60%), reflecting their focus on issuers that generate higher audit fees. In contrast, the Mid 2 and smaller audit firms collectively audit nearly half of public issuers by count, highlighting the distinct roles played by audit firms of different sizes.

We next analyze the trends in auditing across different U.S. stock exchanges and trading platforms. Issuers listing on the New York Stock Exchange (NYSE) show the greatest stability, with the Big 4 consistently accounting for over 96% of total audit fees and auditing between 80% to 90% of issuers over the past two decades. In contrast, the Nasdaq segment experiences a moderate decline in the Big 4's share, with relative audit fees earned by these firms falling from 93% in 2003 to 84% in 2023, accompanied by a sharper drop in the proportion of Nasdaq issuers audited, from 70% to just over 50%. The over-the-counter (OTC) market also displays a large shift, with the Big 4's share of audit fees dropping from 74% in 2003 to 54% in 2023. Similarly, their share of OTC-quoted issuers audited falls from 27% to just under 9%. This decline in Big 4 auditing of OTC-quoted issuers is not accompanied by a meaningful increase in audits performed by the Mid 2 audit firms. Instead, smaller audit firms increase their share, auditing nearly 90% of OTC-quoted issuers in our sample by 2023. These differences highlight that while the aggregate trends in auditing appear stable, significant changes occur beneath the surface, particularly within the Nasdaq and OTC venues.

The relative aggregate stability in audit engagements across auditor sizes during our sample period may mask considerable auditor turnover within and across different types of audit firms. Additionally, significant shifts occur in the number and composition of public issuers over the past two decades. Between 2003 and 2023, the total number of SEC-registered issuers in our sample declines by approximately 54%, from around 7,200 to about 4,700. However, this trend varies notably by trading venue. The number of NYSE-listed issuers remains stable, fluctuating modestly around 1,600 throughout the period. In contrast, Nasdaq-listed issuers initially decrease from around 2,700 in 2003 to just under 2,000 by 2012, before rebounding to approximately 2,300 by 2023. These varying patterns indicate that although overall auditing trends appear stable, changes in issuer composition and exchange dynamics may lead to more nuanced auditor-client engagement patterns among publicly traded issuers.

Subsequently, we assess auditor switching rates to gain additional insights into auditor-client dynamics. Big 4 audit clients exhibit relatively low switching rates, declining from 8-9% annually in the early 2000s to around 3-4% since 2009. When Big 4 clients switch auditors, they predominantly select another Big 4 firm. In contrast, Mid 2 clients exhibit higher switching rates, averaging around 8%, but these also decrease over time. A growing proportion of Mid 2 clients that switch auditors move to a Big 4 firm. Switching rates are highest among clients of smaller audit firms, ranging from 12% to 18% annually. Despite this high turnover, approximately 89% of smaller-firm clients that switch auditors continue to choose other smaller audit firms, suggesting persistence in the selection of auditor size. These distinct switching patterns suggest that policy makers could expect differential responses to standards and rules across issuers and auditors of different sizes.

In the second part of our study, we analyze trends in the total number of PCAOB-registered firms, a requirement for audit firms serving public U.S. issuers or SEC-registered broker-dealers. Following the establishment of the PCAOB in 2003, the overall count of registered firms grows substantially, from approximately 700 initially to nearly 1,500 by 2010. This growth was largely driven by a regulatory change in 2009 mandating PCAOB registration for audit firms serving SEC-registered broker-dealers. However, since peaking in 2010, the cumulative number of registered audit firms steadily declines, falling below 750 by 2023. This decline primarily reflects more firms exiting than entering the PCAOB registry each year since 2011. Notably, over 82% of deregistrations reflect independent exits rather than acquisitions by other audit firms.

Examining annual entry and exit flows beneath these cumulative trends reveals significant year-to-year variation. Initially, a wave of nearly 200 new registrations occurs in 2004, shortly after the

PCAOB's inception, but annual registration rates quickly decline to around 40 new firms annually by 2008. The 2009 broker-dealer rule briefly reverses this trend, leading to a sharp increase of nearly 500 in 2009 and an additional 250 in 2010. Since then, however, new registrations decline and stabilize at around 25 per year since 2017. Deregistrations, in contrast, followed an inverse pattern. Exits are relatively infrequent in the early years, averaging 40 to 50 annually from 2006 to 2009, but spike to nearly 160 in 2010 and remain above 100 per year until 2017. Although deregistrations moderate after 2018, they remain between 60 to 80 per year, still roughly three times higher than the annual entry rate.

Collectively, these registration and deregistration patterns reveal a marked disparity between the numbers of audit firms entering and exiting PCAOB registration, resulting in a significant contraction of the total number of registered audit firms. To be clear, we make no inference about whether this decline reflects changing conditions or incentives for firms regarding PCAOB registration. Instead, we emphasize that the observed trends raise important questions about the evolving environment for public issuer auditing and their broader implications for auditor availability and issuer-auditor relationships.

Importantly, the declining number of PCAOB-registered audit firms and the relatively high rate of deregistrations do not necessarily mean fewer auditors are available to issuers. In fact, we observe significant heterogeneity in the extent to which registered firms participate in auditing public issuers. While a majority (66%) of PCAOB-registered firms issue at least one audit opinion for a U.S. issuer in 2003, this proportion steadily declines, stabilizing below 24% since 2010 and reaching just 21% by 2023. Even when using a broader measure of participation—which includes auditing broker-dealers or providing substantial audit services for issuers or broker-dealers[4]—the percentage of active registered firms still falls notably, from approximately 79% in 2010 to just 53% by 2023.[5] These patterns suggest that PCAOB registration alone does not imply substantive

[4]Information on audit firms playing a substantial role in public issuer audits are only available since the release of Form 2 in 2010.

[5]Firms registered with the PCAOB but not issuing at least one audit opinion for a public issuer or conducting broker-dealer audits or taking on substantial role might register or remain registered for multiple reasons. For example, they might anticipate future engagements with SEC-registered issuers or seek to signal quality through bonding to stricter standards, similar to foreign issuers bonding to U.S. securities laws to enjoy capital market benefits (e.g.,

engagement in auditing public issuers.

To better understand the implications of declining PCAOB registrations, we next examine audit activities among deregistering firms, specifically assessing their recent involvement in auditing public issuers. Our data reveal that a substantial proportion of firms deregistering from the PCAOB have limited recent engagement in public issuer audits. In 2023, fewer than 12% of deregistering firms audited the financial statements of at least one SEC-registered issuer within the three years preceding deregistration, and only 8% issue an audit opinion in the year immediate prior to exit. Even using the broader measure of participation, which includes audits of broker-dealers or substantial roles in issuer audits, only 39% of deregistering firms in 2023 are active within one year prior to deregistration. This indicates that deregistering firms often play a limited role in directly auditing public issuers.

Overall, these patterns highlight a clear asymmetry between audit firm entry and exit from the PCAOB registry over the past decade, predominantly driven by firms that were minimally engaged or inactive in auditing public issuers. Given that most deregistrations involve firms with limited direct involvement in issuer audits, their departures likely have little effect on the availability of auditors actively engaged in public issuer audits. These findings highlight the importance of examining firm-level audit activities, rather than registration counts alone, when evaluating the impact of regulatory changes on auditor availability and issuer-audit relationships.

The patterns we document offer an important foundation for future research into the dynamics of audit-client relationships in public markets, which can play a critical role in informing policy discussions. Several open questions merit further examination by researchers. For example, how do regulatory changes influence firms' decisions to enter or exit PCAOB registration, particularly among smaller firms? What underlying factors drive auditor-client switching decisions across different auditor sizes or issuer types, and to what extent are these choices driven by issuer needs versus auditor characteristics? In particular, understanding auditor turnover among OTC-quoted issuers—where switching rates are high but underlying causes remain unclear—would provide

Doidge et al., 2004).

valuable insights. Additionally, future studies could examine how shifts in issuer composition and audit firm registration influence auditor availability and evaluate the long-term sustainability of audit supply from smaller firms under evolving regulatory conditions. Finally, exploring the broader implications of these auditing dynamics for audit quality, issuer-auditor relationships, and overall outcomes for capital markets could further strengthen the evidence base for effective policymaking in this critical area.

2 Institutional Background

In response to the 1929 stock market crash, Congress enacted the Securities Act of 1933 and the Securities Exchange Act of 1934 (Exchange Act), aiming to restore trust in financial markets through enhanced transparency and stronger investor protection. The Securities Act established the first federal requirement for issuer disclosure, mandating annual public filings of financial statements such as balance sheets and income statements. The Exchange Act created the SEC and empowered it to require third-party audits of financial statements filed by public issuers. Although certain exchanges, such as the NYSE, had already mandated audited financial statements, the SEC gradually expanded the scope of this requirement over time (Stigler, 1964; Benston, 1973).[6]

The SEC, however, did not directly establish or enforce audit standards. Instead, it allowed the audit profession to develop its own standards under the leadership of private actors, including national securities exchanges (e.g., NYSE) and accounting organizations such as the American Institute of Accountants (AIA), the predecessor of the American Institute of Certified Public Accountants (AICPA) (e.g., Bourveau et al., 2025). For several decades, audits of public issuers remained largely self-regulated through the AICPA-administered peer-review program, which involved public disclosure of review outcomes. Academic research provides evidence that this peer-review program offered investors valuable insights into audit quality (e.g., Hilary and Lennox, 2005).

After high-profile scandals, including the collapse of Enron, Congress passed SOX in 2002

[6]Initially, the SEC audit requirement applied only to securities listed on major exchanges but was extended in 1964 to securities quoted in the OTC markets (e.g., Greenstone et al., 2006).

to rebuild investor confidence in capital markets. The perception was that audit self-regulation through peer reviews results in audit quality below socially desirable levels. Consequently, SOX establishes the PCAOB, a nonprofit organization operating under SEC oversight, charging it with regulating audits of public issuers. The PCAOB's primary objective is to protect investor interests and promote public confidence by setting audit standards, conducting inspections of audit firms, and enforcing compliance with these standards. We briefly describe these regulatory functions of the PCAOB in more detail below.

Since 2003, accounting firms auditing the financial statements of public issuers in U.S. capital markets must register with the PCAOB. In 2009, the registration mandate was expanded to include firms auditing broker-dealers. Firms that no longer audit public issuers, broker-dealers, or perform substantial roles can voluntarily deregister from the PCAOB. Upon deregistration, these firms no longer fall under PCAOB oversight or its auditing standards. Instead, their private company audits are governed by Generally Accepted Auditing Standards (GAAS), a set of private auditing guidelines originally established by the AICPA in 1939 and regularly updated thereafter.

The PCAOB establishes and amends audit standards governing the planning, performing, and reporting of public issuer financial statement audits. These standards address not only technical aspects of auditing but also audit firm independence, ethical behavior, and internal quality controls. To help ensure compliance, the PCAOB regularly inspects registered audit firms' engagements, with the inspection frequency depending on the size of the firm and the number of its public issuer audits. Specifically, the PCAOB inspects firms conducting more than 100 public issuer audits annually (e.g., Big 4 accounting firms) every year, while firms auditing 100 or fewer issuers annually are inspected at least once every three years. Foreign firms auditing U.S.-based issuers are subject to similar PCAOB inspection requirements.

The PCAOB's inspections focus on a selected number of past audit engagements along with an evaluation of the firm's quality control system. Each inspection results in a formal inspection report, which summarizes deficiencies identified by PCAOB inspectors. These reports consist of two primary sections. Part I findings detail deficiencies related to specific issuer audit engagements, while Part II findings comment on audit firm-wide quality controls. A notable difference is that Part I findings are always made public, while Part II findings are only made public if the audit firm fails to remediate the identified issues within 12 months. Academic studies suggest that the shift from audit self-regulation to public oversight increased trust in capital markets (Gipper et al., 2020), and that further providing information about the credibility of public issuers' audits through the release of inspection reports is valuable to investors (Acito et al., 2024).

The PCAOB also enforces compliance with its standards by sometimes imposing sanctions on audit firms and/or individual auditors who violate established rules or fail to adhere to auditing standards. Sanctions can include monetary penalties or restrictions on a firm or individual's ability to conduct audits of public issuers. Audit firms or auditors subject to PCAOB sanctions have the right to petition the SEC for a review of the imposed sanction, and the PCAOB does not publicly disclose sanctions until the SEC review is complete. In 2024, the PCAOB announced 51 enforcement actions, of which 40 involved audit performance deficiencies.

Finally, it is important to note that auditing of publicly traded issuers in the U.S. is primarily conducted by a handful of large firms that consistently serve the majority of public issuers throughout the twenty-first century. Over time, the number of large audit firms decreases due to mergers (e.g., Ernst & Young formed from the merger of Ernst & Whinney and Arthur Young in 1989) or exits (e.g., Arthur Andersen in 2002). Historical accounts indicate, however, that a limited number of audit firms were already auditing a substantial proportion of publicly-listed issuers even before the SEC audit mandate in 1934, suggesting that long-standing institutional arrangements shape the set of audit firms serving public issuers (Bourveau et al., 2025).[7] While market concentration generally raises competition concerns, some researchers argue that this structure emerged due to economies of scale in auditing, and that larger firms have strong incentives to maintain high audit quality as a way to protect their reputation and market position (DeAngelo, 1981; Watts and Zimmerman, 1983).

[7] A similar degree of audit market concentration is observable across major capital markets globally. See Ferguson et al. (2025) for a recent longitudinal study based in Australia.

3 Data

Our study uses two primary datasets covering the period from 2003 to 2023: one comprising public issuers and the other consisting of audit firms. To construct our issuer sample, we include all operating companies with a business address in the U.S. that are registered with the SEC using data from Audit Analytics and Capital IQ. We exclude entities such as funds, trusts, and shell companies. We further limit our sample to issuers with primary listings on the NYSE or Nasdaq exchanges or those quoted OTC.[8] We restrict the sample in this way to ensure that all included issuers are subject to mandatory PCAOB-audited financial disclosures. We obtain audit opinions, along with auditor identities and audit fees, from Audit Analytics. We define the sample year as the calendar year of the fiscal year-end date of the audit report provided by Audit Analytics.[9] This selection procedure yields a final sample of 14,642 unique issuers.

For our audit firm sample, we obtain data from the PCAOB's Registration, Annual, and Special Reporting (RASR) system, limiting the set of firms to those headquartered in the U.S. We classify an audit firm as actively auditing public issuers if it issues at least one audit opinion for a given year for a U.S. issuer registered with the SEC from our issuer sample described above. As such, our measure may slightly under-estimate audit firm activity if U.S.-based firms exclusively audit foreign issuers.[10] As an alternative measure of audit firm activity used in some tests, we define an audit firm as "active" if it issues audit opinions for issuers or broker-dealers or played a substantial roles in the audits of issuers or broker-dealers. Information for this alternative definition is obtained from PCAOB Form 2 filings, which are available from 2010 onward through RASR.[11] Finally, we identify firms that deregister from the PCAOB using RASR. We distinguish between

[8]We obtain issuers' primary listing or quotation venue from Capital IQ. For the NYSE exchange, we include NYSE and NYSE Market LLC. For the Nasdaq exchange, we include Nasdaq Global Select, Nasdaq Global Market, and Nasdaq Capital Market. For the OTC exchange, we include issuers from the OTC Bulletin Board and OTC Pink Sheet.

[9]Except for fiscal year-end dates before January 15, which we categorize as belonging to the prior calendar year—consistent with the definition of a fiscal year as applied by Audit Analytics.

[10]This is unlikely to be material since foreign issuers typically get audited by a domestic audit firm that is then subject to PCAOB oversight.

[11]Firms file Form 2 based on PCAOB reporting year, which is the 12-month period from April 1 to March 31. Thus, all calculations using Form 2 filing information are based on PCAOB reporting years.

deregistration due to independent exits versus those related to acquisitions by other audit firms. Acquisitions are identified using the Audit Firm Event dataset from Audit Analytics, restricted to "M&A" events occurring within a two-year window centered on the deregistration date. Following these procedures, our final audit firm sample includes 2,434 unique audit firms.

4 Auditor Size and Client Patterns

4.1 Proportion of Public Issuer Audits by Firm Size

Figure 1 presents the proportion of public issuer audits from 2003 to 2023 for the Big 4, Mid 2, and smaller audit firms. Panel A of Figure 1 depicts the share of total audit fees earned by each size group.[12] The plot shows that the Big 4's proportion of total audit fees remains largely stable over time, averaging around 92%. Mid 2 audit firms maintain a relatively small yet consistent proportion, averaging about 4% throughout the sample period. The remaining share of audit fees, also averaging 4%, is distributed among numerous smaller audit firms registered with the PCAOB.

While the overall distribution of audit fees across firm sizes remains stable without large shifts, there are some variations over time. The Big 4's proportion of total audit fees is 94% in 2003 but declines to 90% by 2007, then fluctuates between 91% and 93% before settling at 91% in 2023. The Mid 2 firms experience modest growth during the first half of the sample period, increasing from 2% in 2003 to 4% by 2006, after which their proportion of audit fees remains between 3% and 4% annually through 2023. The proportion of audit fees earned by smaller firms also remains limited but grows from 3% in 2003 to 5% by 2006, then varies between 4% and 5% through 2023.

Panel B of Figure 1 presents auditor proportions based on the number of issuers audited for the same sample period. The plot reveals a more dispersed pattern compared to audit fee proportions shown in Panel A. This difference arises because smaller and mid-sized audit firms serve a larger proportion of issuers when measured by client counts rather than fees collected. On average, the

[12] To calculate fee proportions, we exclude observations with missing audit fee information in Audit Analytics. If an issuer uses more than one audit firm in a year, we assume each audit firm receives an equal portion of the audit fees.

Big 4 audit firms account for 51% of issuers throughout the sample period, which is significantly lower than their 92% average proportion of total audit fees. This reflects the Big 4's greater focus on larger issuers, which generate higher audit revenues. The proportion of issuers audited by the Big 4 fluctuates moderately over time, starting at approximately 58% in 2003, declining to just under 50% from 2006 to 2013, and subsequently increasing to 55% by 2023. The Mid 2 audit firms consistently audit about 8% of issuers, with modest variations between 7% and 9% throughout the sample period. Smaller firms audit the remaining 41% of issuers, showing a relatively steady proportion that experiences minor fluctuations, starting at approximately 35% in 2003, increasing to 47% by 2009, and then slowly declining to 37% by 2023.

These patterns highlight clear differences in audit-client relationships depending on firm size. While the Big 4 audit firms perform audits generating over 90% of the total audit fees among U.S. issuers, their proportion of audited issuers is significantly lower because they typically serve larger clients. The Mid 2 and smaller audit firms collectively audit nearly half of all public issuers by number, which reflects their important role in auditing mid-size and smaller publicly traded companies. These trends raise important policy questions: to what extent do barriers to entry and scale economies explain the continued prominence of larger audit firms? Alternatively, does stability in auditor-client relationships reflect persistent issuer preferences or regulatory constraints?

4.2 Auditor Proportions by Issuer Trading Venue

4.2.1 NYSE-Listed Issuers

Figure 2 shows the proportion of NYSE-listed issuer audits over 2003-2023, based on total audit fees and the number of issuers. Panel A of Figure 2 plots these proportions over time using total audit fees. The figure highlights the sustained prominence of the Big 4 audit firms, whose proportion of audit fees from NYSE-listed-issuers consistently exceeds 96% throughout the sample period. Their proportion was 98.6% in 2003, gradually declining to 97.3% by 2008 and 96.8% by 2018, but remains above 96% at the end of the period in 2023, demonstrating substantial stability.

The Mid 2 audit firms account for a small but persistent proportion of audit fees among NYSE-listed issuers, maintaining between roughly 1% and 2% throughout the sample period. Smaller audit firms collectively account for approximately 1% or less of total audit fees for most of the period (2003-2017), though their proportion grows modestly from 0.5% in 2003 to 1.5% by 2023.

Panel B of Figure 2 shows auditor proportions among NYSE-listed issuers based on the number of issuers audited for the same time period. This figure reveals a greater dispersion compared to the audit fee measure, as Big 4 firms audit a smaller fraction of issuers than indicated by their proportion of audit fees. Over the sample period, the Big 4 audit firms collectively audit, on average, of 83% of NYSE-listed issuers, lower than their 97% proportion of audit fees. The Big 4's proportion of NYSE-listed issuer audit fees declines from 89% in 2003 to 82% by 2009, and further to 81% in 2017, ending at 80.5% in 2023. The Mid 2 firms account for a modest but stable proportion of issuer audits, averaging 7% over the period. Their proportion grows from 4.1% in 2003 to 6.5% by 2008, surpasses 7% by 2013, and remains above this level through 2023. Smaller audit firms audit an average of 11% of NYSE-listed issuers, significantly higher than their proportion of audit fees, which averages about 1%. The proportion of NYSE-listed issuers audited by smaller firms gradually increases from 7% in 2003 to 12% in 2009, then fluctuates between 10% and 12% through the rest of the sample period. This pattern reflects a modest but consistent rise in the presence of non-Big 4 firms among NYSE-listed issuer audits.

Overall, Figure 2 indicates that NYSE-listed issuers overwhelmingly rely on the Big 4 for audit services, with only limited involvement by Mid 2 and smaller firms. Although non-Big 4 auditors modestly increase their proportion of NYSE-listed issuers over time, their proportion of audit fees remains quite small, and the Big 4 continue auditing the majority of these issuers. The pronounced reliance on the largest auditors raises questions about the extent to which regulatory factors, issuer characteristics, or institutional factors influence NYSE-listed issuers' auditor choices. Future research could examine whether this stability reflects the preferences or characteristics of the largest issuers or other factors shaping auditor-client relationships among NYSE-listed issuers.

4.2.2 Nasdaq-Listed Issuers

Figure 3 reports auditor proportions among Nasdaq-listed issuers from 2003 to 2023, based on total audit fees and the number of issuers audited. Panel A plots these proportions using total audit fees. The figure indicates that, while the Big 4 firms account for most audit fees among Nasdaq-listed issuers—averaging 87% throughout the sample period—their proportion decreases over time. In 2003, the Big 4 audit firms account for 93% of total audit fees for Nasdaq-listed issuers. This proportion gradually declines to 85% by 2009 and further to 84% by 2023. The decline is gradual, with some fluctuations, and represents a notable contrast to the higher and more stable proportion of audit fees earned by the Big 4 among NYSE-listed issuers.

The Mid 2 firms exhibit a moderate increase in their proportion of audit fees for these issuers over time, rising from 4% in 2003 to a peak of 9% in 2007 before stabilizing between 6% and 7% throughout most of the sample period. This proportion remains at 7% in 2023, reflecting a more noticeable presence among Nasdaq-listed issuers compared to those listed on the NYSE. Smaller audit firms also experience an increase, growing from under 3.6% in 2003 to 9.3% in 2023, nearly tripling over the two decades. This shift suggests a slow but steady reduction in the proportion of audit fees earned by the Big 4 among Nasdaq-listed issuers, with smaller firms gaining a more substantial presence over time.

Panel B of Figure 3 presents auditor proportions among Nasdaq-listed issuers based on the number of issuers audited. The results indicate that the proportion of issuers audited by the Big 4, although substantial, is lower compared to their proportion based on audit fees. On average, the Big 4 audit 57% of Nasdaq-listed issuers, which is much lower than their 87% proportion of total audit fees, again reflecting their focus on larger issuers with higher fees. The proportion of issues audited by the Big 4 declines over the sample period, falling from 73% in 2003 to a low of 53% by 2019, remaining at 53% in 2023. The Mid 2 firms maintain a relatively stable presence, auditing approximately 11% of Nasdaq-listed issuers on average, fluctuating between 7% and 12% during the sample period and reaching a peak of 12% in 2016. Smaller firms consistently audit a larger proportion of Nasdaq-listed issuers compared to the Mid 2, increasing steadily from 20% in 2003 to 33% in 2013 and reaching 37% in 2023. This trend reflects a sustained increase in the presence of smaller audit firms among Nasdaq-listed issuers.

Taken together, Figure 3 reveals notable differences in auditor-client relationships between Nasdaq-listed and NYSE-listed issuers. While the Big 4 maintain a strong presence among Nasdaq-listed issuers, their proportion gradually decreases over time, particularly when measured by the number of issuers audited. This trend contrasts with the stable presence of the Big 4 among NYSE-listed issuers. The increasing involvement of smaller audit firms among Nasdaq-listed issuers suggests greater accessibility for these auditors. Future research could explore whether this greater accessibility results from changes in issuer composition, issuer characteristics, regulatory pressures, or other institutional factors affecting auditor selection among Nasdaq-listed issuers.

4.2.3 OTC-Quoted Issuers

Figure 4 graphs auditor proportions among OTC-quoted issuers from 2003 to 2023, based on total audit fees and the number of issuers audited. Panel A of Figure 4 plots these trends using total audit fees. Panel A shows that, in contrast to NYSE- and Nasdaq-listed issuers, the proportion of audit fees earned by the Big 4 from OTC-quoted issuers decreases more substantially. The Big 4 accounts for 74% of audit fees from OTC-quoted issuers in 2003, declining to 62% by 2010, and further to 54% by 2023. This decline exceeds that seen among Nasdaq-listed issuers, indicating a notable shift toward non-Big 4 audit firms among OTC-listed issuers.

The Mid 2 audit firms maintain a modest but relatively stable presence among OTC-quoted issuers, with accounting for an average of 9% of audit fees from these issuers throughout the sample period. Their proportion is 8% in 2003, peaks at 11% in 2016, and declines to 6% by 2023. Smaller audit firms steadily increase their proportion of audit fees from OTC-quoted issuers, increasing from 19% in 2003 to 24% in 2013, and further to 40% by 2023. This substantial increase suggests a meaningful shift toward smaller firms among OTC-quoted issuers.

Panel B of Figure 4 presents auditor proportions among OTC-quoted issuers based on the number of issuers audited. This measure reveals significantly greater involvement of smaller audit firms compared to what is shown by the audit fee proportions. On average, the Big 4 audit just 14% of OTC-quoted issuers—considerably lower than their 67% proportion of audit fees—reflecting their focus on relatively larger OTC-quoted issuers, while smaller firms handle most engagements. The proportion of OTC-quoted issuers audited by the Big 4 declines sharply from 27% in 2003 to only 9% by 2023. Mid 2 firms audit an average of 6% of OTC-quoted issuers, declining from a peak of 8% in 2003 to 3% in 2023. In contrast, smaller firms steadily increase their proportion, rising from 66% of OTC-quoted issuers in 2003 to 88% by 2023. This reflects a clear and steady increase in the involvement of smaller audit firms among OTC-quoted issuers.[13]

Collectively, Figure 4 illustrates that auditing of OTC-quoted issuers has shifted significantly over the past two decades, with the Big 4 auditing fewer OTC-quoted issuers and smaller firms auditing a larger proportion, both in terms of audit fees and number of issuers. Unlike the NYSE- and Nasdaq-listed issuers, OTC-quoted issuers show a pronounced transition toward smaller audit firms. These trends suggest differences in auditor-client relationships depending on auditor size and issuer type. Future research could examine whether this shift is driven by regulatory changes affecting OTC-quoted issuers and auditors, issuer characteristics or preferences, differences in audit quality across audit firm types, or other factors influencing auditor selection. Additionally, researchers may wish to investigate how entry conditions and audit cost structures affect auditor availability and choices among smaller issuers.

4.3 Declining Number of SEC-Registered U.S. Issuers

Figure 5 presents yearly trends in the number of issuers from 2003 to 2023, both in aggregate and separately for NYSE- and Nasdaq-listed issuers, based on the issuer count sample.[14] Figure 5 shows a substantial decrease in the total number of SEC-registered issuers throughout the sample period. In 2003, there are 7,228 U.S. issuers, but this number declines to 4,686 by 2023, representing a reduction of nearly 54%. However, as shown in Figure 5, this decline varies notably across

[13] We previously discuss the number of quoted issuers in the OTC sample in the Section 4.2.3.

[14] Audit fee information is missing in around 2% of issuer-years.

listing venues, exhibiting distinct trajectories for NYSE- and Nasdaq-listed issuers.

Despite the overall reduction in the number of issuers, the count of NYSE-listed issuers remains relatively stable throughout the sample period. In 2003, 1,665 issuers list on the NYSE, and by 2023, this number stands at 1,588. The number fluctuates slightly over time, reaching a low of 1,520 in 2019. As shown in Figure 5, NYSE-listed issuers exhibit a relatively stable trajectory compared to issuers listed on other exchanges or trading venues. This stability suggests that while there the total number of publicly traded issuers decreases, firms listing on the NYSE, who are typically larger and more established, maintain a consistent presence.

In contrast, the number of Nasdaq-listed issuers follows a more dynamic trend. In 2003, there are 2,663 Nasdaq-listed issuers, but this number declines steadily during the first half of the sample period, reaching a low of 1,978 in 2012. However, the count subsequently rebounds, increasing to 2,340 issuers in 2023. Figure 5 illustrates this somewhat U-shaped pattern, indicating that Nasdaq-listed issuers experience an initial contraction followed by recent expansion. This pattern suggests there are increases in issuer activity on Nasdaq in recent years.[15]

As a whole, the results in Figure 5 highlight the importance of examining auditor-client relationships beyond aggregate trends. The relative stability of NYSE-listed issuers, the fluctuations among Nasdaq-listed issuers, and the notable reduction in the number of U.S.-based OTC-quoted issuers that are SEC-registered all suggest distinct dynamics depending on the trading venue. Future research could examine how changes in issuer composition and numbers affect demand for audits and the resulting auditor-client relationships. In particular, research could explore how changes in issuer demand for auditing affects the proportions of Big 4 and non-Big 4 engagements.

[15] We also observe a notable shift in issuer composition within OTC-quoted issuers. The number of these issuers in our sample declines substantially from 2,901 in 2003 to just 758 by 2023. However, we refrain from drawing broad conclusions about the entire OTC population, as our restrictive definition includes only U.S.-based, SEC-registered issuers. It excludes many non-SEC-registered U.S. issuers (including financial institutions subject to banking reporting requirements and issuers following the alternative reporting system), as well as numerous foreign-based issuers quoted as Level 1 ADRs, which do not require SEC registration.

4.4 Auditor Switching

4.4.1 Switching by Big 4 Clients

In Figure 6, we report annual auditor switching rates for Big 4 clients from 2003 to 2022, along with the percentage of switching issuers that move to another Big 4, Mid 2, or smaller audit firm. We identify switching by examining whether an issuer in year t changes auditors in the subsequent year $t + 1$. Therefore, our sample for this analysis ends in 2022 rather than 2023, since we require auditor data from the following year.[16]

Panel A of Figure 6 plots the overall switching rate for Big 4 clients over time, illustrating a clear downward trend over the sample period. In the first three years, switching rates range between 8.2% and 9.9%. However, starting around 2006, switching rates for Big 4 clients begin to decline, stabilizing between 2.4% and 4.8% annually from 2009 onward. By 2022, only 2.7% of Big 4 clients switch auditors, marking a substantial decrease from the early 2000s.

Panel B of Figure 6 tracks the destinations of Big 4 clients that switch auditors, revealing three patterns. First, we observe an increase in the proportion of issuers switching to another Big 4 firm. Specifically, the proportion of switching issuers that move within the Big 4 increases significantly over time. In the first two years of the sample, about 22%-23% of switching clients transition to another Big 4 firm. This proportion steadily rises, peaking at 67% in 2009 and ranging from 41% to 61% in subsequent years. The increasing likelihood of within-Big 4 switching suggests strong persistence among Big 4 clients, who rarely move toward Mid 2 or smaller audit firms after previously selecting a Big 4 auditor. Second, the proportion of switching Big 4 clients that move to a Mid 2 firm decreases over time. Although the annual average is 22.7% during the sample period, the proportion declines from just over 30% in the early years (2003–2004) to below 14% in certain recent years, despite some year-to-year variation. Thus, we find limited evidence of increasing client flows from the Big 4 to Mid 2 firms. Third, the proportion of Big 4 clients switching to smaller audit firms exhibits a downward trend but remains substantial. In 2003, 46% of switching Big 4 clients move to a smaller audit firm. This proportion falls to 19% in 2009 but fluctuates

[16]For this analysis, we also limit the sample to issuers that use a single auditor in a given year.

somewhat thereafter. By 2022, 32% of switching clients move to a smaller firm, suggesting that a subset of Big 4 clients continue to choose smaller auditors when changing auditors.

Panel C of Figure 6 displays auditor switching rates among Big 4 clients according to the venue where their stock is listed or quoted (NYSE, Nasdaq, or OTC). Switching rates of Big 4 clients are consistently higher for Nasdaq-listed issuers compared to NYSE-listed issuers. On average, 2.2% of all Big 4 clients annually are Nasdaq-listed issuers switching auditors, compared to 1.2% for NYSE-listed issuers. OTC-quoted issuers switching from a Big 4 auditor represent 1.0% on average, although this figure was higher (3.7%) in the early 2000s before declining sharply. Thus, the propensity to switch auditors among Big 4 clients varies depending on where an issuer's stock is traded.

In summary, Figure 6 reveals declining auditor-switching activity among Big 4 clients, along with an increasing tendency for clients that do switch to choose another Big 4 auditor. These findings again indicate persistent auditor-client relationships within the Big 4 group. Once issuers choose a Big 4 auditor, they seldom move to Mid 2 or smaller audit firms. The limited movement toward Mid 2 firms raises questions about the factors that influence issuer decisions when changing auditors. Future research could explore whether these patterns stem from higher switching costs, regulatory frictions, or strong relationships between issuers and their auditors. Understanding whether these factors create barriers to switching or reflect genuine efficiency gains in auditor-client engagements could provide deeper insights auditor selection and auditor-client relationships, especially among clients of Big 4 firms.

4.4.2 Switching by Mid 2 Clients

Figure 7 reports annual auditor switching rates for Mid 2 clients from 2003 to 2022, along with the percentage of switching issuers that move to a Big 4, another Mid 2, or a smaller audit firm. Panel A of Figure 7 plots the overall switching rate for Mid 2 clients over the sample period.

Mid 2 clients exhibit higher auditor switching compared to Big 4 clients (8.1% on average for Mid 2 clients versus 4.4% for Big 4 clients), but switching rates for these clients also decline over time. In the early 2000s, switching is more frequent for Mid 2 clients, exceeding 14% in both 2003 and 2004. By 2006, switching rates decline to 7.6%, eventually reaching a low of 1.8% in 2010. After 2011, switching rates fluctuate between 5% and 11%. These patterns indicate that, while Mid 2 clients switch auditors more frequently than Big 4 clients, their switching rates remain relatively low and decline over time.

Panel B of Figure 7 tracks the destination of Mid 2 clients that switch auditors, providing three takeaways. First, an increasing proportion of switching Mid 2 clients choose a Big 4 auditor. Early in the sample period, just 6.5% of switching Mid 2 clients move to a Big 4 firm. This proportion rises significantly over time, peaking just under 60% in 2009, and remains above 30% in many subsequent years, ending at 61% in 2022. This trend suggests that Big 4 auditors increasingly attract Mid 2 clients when these issuers switch auditors. Second, switching from one Mid 2 to the other Mid 2 auditor is relatively rare, averaging 10% throughout the period and fluctuating from year-to-year. Third, the majority of switching Mid 2 clients transition to smaller audit firms, averaging 56% over the sample period. However, this proportion varies a lot over time. In 2003, 90% of switching Mid 2 clients move to a smaller firm, but in subsequent years the proportion varies widely, from as low as 14% to as high as 86%.

Panel C of Figure 7 plots the percentage of issuers switching from a Mid 2 auditor according to their trading platform (NYSE, Nasdaq, or OTC). On average, 4.0% of Mid 2 clients annually are Nasdaq-listed issuers switching auditors, compared to 2.7% for OTC-quoted issuers and 1.4% for NYSE-listed issuers. Early in the sample period, OTC-quoted issuers have particularly high switching rates (peaking at 9.8% in 2003), though these rates fall sharply thereafter. Nasdaq-listed issuers with a Mid 2 auditor have more stable switching rates, ranging between 1% and 7%. NYSE-listed issuers consistently exhibit lower and less variable switching from a Mid 2 firm, never exceeding 3.1%. Thus, the likelihood of switching auditors among Mid 2 clients varies according to the trading venue of the issuer.

To summarize, Figure 7 reveals distinctive switching dynamics among Mid 2 clients relative to Big 4 clients. Mid 2 firms experience higher client turnover and increasingly lose clients to Big 4 auditors over time, while a substantial share of their switching clients move toward smaller audit firms. Future research could explore whether these switching patterns result from differences in audit pricing, service offerings, or issuer characteristics. Additionally, exploring how regulatory factors or perceived differences in audit quality affect auditor selection among Mid 2 clients could offer further insights into auditor-client relationships in this setting.

4.4.3 Switching by Smaller Firm Clients

Figure 8 graphs annual auditor switching rates for smaller firm clients from 2003 to 2022, along with the percentage of switching issuers that move to a Big 4, Mid 2, or another smaller audit firm. Panel A of Figure 8 plots the overall switching rate for smaller firm clients over time.

Smaller firm clients exhibit the highest auditor switching rates among all issuer groups, averaging 15% throughout the sample period. Switching rates fluctuate over time but consistently higher relative to those observed among Big 4 and Mid 2 clients. In the early years of the sample (2003-2006), annual switching rates range between 15.1% and 17.5%. Unlike the patterns observed for Big 4 and Mid 2 clients, which experience declining switching rates over time, smaller firm clients continue to exhibit higher switching rates throughout the sample period, never falling below 11.6% or exceeding 17.7%.

Panel B of Figure 8 tracks the destination of smaller firm clients when they switch auditors. Most of these issuers (89% on average) remain with another smaller audit firm when after switching. This proportion consistently remains above 82% each year, peaking at nearly 95% in 2004. These findings indicate switching clients of smaller firms typically continue to select auditors within this group. However, a small but nontrivial proportion of switching issuers moves towards larger auditors. The proportion transitioning to Mid 2 firms averages 5% throughout the sample period, fluctuating annually between 2% and 11%, reaching its highest point in 2012. Additionally, approximately 6% of switching smaller firm clients move to a Big 4 auditor, with annual variation between a low of 3% (2014) and a high of 11% (2020). These patterns suggest that, while most switching clients of smaller firms remain within their existing auditor size group, some issuers do select larger auditors when they change audit firms.

Panel C of Figure 8 displays the percentage of issuers that switch auditors from a smaller audit firm according to the issuer's trading venue (NYSE, Nasdaq, or OTC). On average, 10.6% of smaller firm clients annually are OTC-quoted issuers switching auditors, compared to 3.4% for Nasdaq-listed issuers and only 0.9% for NYSE-listed issuers. Auditor turnover among OTC-quoted issuers remains consistently higher, fluctuating between 6% and 15% throughout the sample period. Nasdaq-listed issuers have lower but gradually increasing switching rates, rising from around 2% in the early 2000s to 8% in 2022. In contrast, NYSE-listed issuers consistently exhibit minimal and stable switching rates, never exceeding 1.4%. Thus, auditor switching among smaller firm clients varies across issuer trading venues.

Taken together, Figure 8 highlights the high auditor turnover among smaller firm clients, a trend that differs from those observed among clients of the Big 4 and Mid 2. While most smaller firm clients that switch remain within the smaller firm category, a proportion moves to larger audit firms when switching. Future research could explore whether the persistently high switching rates among smaller firm clients reflects changes in the supply or demand for audit services by smaller audit firms. On the demand side, differences in audit pricing or changes in issuers' characteristics could lead to switching auditors. On the supply side, regulatory factors may create greater incentives for turnover if audit firms are no longer willing to audit public issuers. Additionally, further analysis could examine why some smaller firm clients transition toward larger auditors, providing insights into the factors influencing auditor selection among these issuers.

5 Registration

5.1 Audit Firm Registration Dynamics

Figure 9 plots the number of PCAOB-registered audit firms from 2003 to 2023, along with the annual number of new registrations and deregistrations. We separate deregistrations into firms acquired by another audit firm within a two-year window centered on the deregistration date and those exiting independently. The results show three distinct phases in audit firm registration dynamics: 1) an initial wave of registrations following the PCAOB's establishment, 2) a sharp increase related to broker-dealer audit firm registration requirements, and 3) a prolonged period of net decline in the number of registered audit firms.

In the first phase (2003–2008), registered firms increased from 726 to 980.[17] This expansion was driven primarily by new registrations, which peaks at 726 in 2003 and declines sharply thereafter, dropping to 40 by 2008. Deregistrations during this period are relatively limited, averaging 47 annually, with most exits (about 80% or 190/237) consisting of firms leaving independently rather than through acquisition. The declining rate of new registrations suggests that most firms planning to engage in public issuer audits registered soon after the PCAOB's inception.

The second phase (2009–2010) is driven by a regulatory change requiring audit firms of broker-dealers to register with the PCAOB. This rule is followed by 473 new registrations in 2009, pushing total registered firms from 975 to 1,403, followed by an additional 243 registrations in 2010, bringing registrations to a peak of 1,490 firms. However, this increase in registrations is accompanied by a rise in deregistrations, reaching 156 in 2010, which is more than triple the annual average of 47 deregistrations we observe during the first phase.

The third phase (2011–2023) is characterized by a persistent decline in the number of registered firms. From the 2010 peak, the number steadily declines to 743 by 2023. Deregistrations consistently exceed new registrations, with total annual exits averaging just under 100 firms from 2011 to 2023. Approximately 81% (80/98) of these deregistrations are independent exits rather than acquisitions, indicating that the majority of firms leaving the PCAOB registry do so without consolidation into other audit firms. New registrations during this phase are relatively modest, averaging just 41 per year, which is insufficient to offset the high rate of deregistrations.

Overall, Figure 9 illustrates the evolving landscape of PCAOB firm registration. The figure

[17] Note that not all the audit firms that were active in the markets for public issuers' audits in the early 2000s registered with the PCAOB. In fact, DeFond and Lennox (2011) document that several hundreds of audit firms never registered with the PCAOB, which they interpret as reducing the supply of audit in U.S. capital markets. They further argue that non-registering firms were presumably of lower quality (using the compliance with and outcome of the AICPA peer-review program). This later finding on audit quality has been challenged by Fargher et al. (2018).

shows an initial expansion, a regulatory-driven spike, and a subsequent prolonged decline. The partition of deregistrations into acquisitions and independent exits shows that most exits represent firms leaving the domain of public issuer audits entirely rather than industry consolidation. These findings raise important questions about the long-term implications of declining audit firm participation among public issuer audits. Future research could investigate the factors behind independent exits and whether the persistent decline in net registrations reflects strategic decision, regulatory burdens, competitive pressures, or broader market forces (e.g., changes in the composition and number of public issuers), and how these shifts impact auditor choice, issuer-auditor relationships, and firm consolidation.

5.2 Registered Firm Activities

We next examine the proportion of PCAOB-registered firms that issue at least one audit opinion for a U.S. issuer and those active in issuer or broker-dealer audits, either directly or in substantial roles. Figure 10 plots these trends over time. The results highlight a notable decline in the proportion of registered firms actively participating in public issuer audits, suggesting PCAOB registration alone does not indicate substantive engagement with public issuer audits.

The percentage of registered firms issuing at least one audit opinion sharply declines. In 2003, 66.0% of registered firms issue at least one audit opinion, falling steadily to 40.4% by 2008 and further to 27.0% in 2009. Since 2010, this proportion remains below 24%. By 2023, only 21.0% of registered firms issue an audit opinion for a U.S. issuer, indicating a shrinking fraction directly engaging in public issuer audits.

We also plot a broader measure of being "active" that includes firms issuing audit opinions for issuers or broker-deals or playing a substantial role in issuer or broker-dealer audits. Using this measure, we observe a similar declining trend. Data since 2010 reveal that initially, 78.9% of registered firms are active either through direct engagements or substantial roles. This proportion declines to 70.5% by 2014 and further decreases to 58.7% by 2018. By 2023, only 53.0% of registered firms are active in issuer or broker-dealer audits, either directly or in a substantial capacity.

This continued decrease emphasizes that many registered firms no longer substantively participate in public audits.

The findings in Figure 10 illustrate the gap between PCAOB registration and audit activity involving public issuers. Although total registrations fluctuate, only a subset actively issues opinions, and this proportion diminishes notably over time. Future research might explore factors driving this decline, such as the costs of maintaining PCAOB registration, shifts in the demand for audit services, or strategic decisions by firms to remain registered without engaging actively in auditing public issuers.

5.3 Deregistering Firm Activities

We next examine audit activity among firms deregistering from the PCAOB. Specifically, we measure the percentage that issue at least one U.S. issuer audit opinion and the broader percentage actively involved through issuer or broker-dealer audits, either directly or through substantial roles. Panels A and B of Figure 11 illustrate these trends. The results indicate that many deregistering firms have limited recent engagement with public issuer audits, with relatively few actively conducting audits shortly before deregistration.

Panel A of Figure 11 shows the proportion of deregistering firms that issue at least one audit opinion for a U.S. issuer within the one (solid line) and three (dashed line) years preceding deregistration.[18] In the earlier part of our sample period, a substantial proportion of deregistering firms issue audit opinions shortly before deregistration. For example, in 2005, 30.0% audit at least one issuer within the year prior to deregistration, and 55.7% do so within two years. By contrast, recent years show significantly lower levels of engagement. By 2023, only 7.9% issue an audit opinion in the preceding year, and just 10.5% do so within two years. Extending the horizon to five years (not graphed), only 14.5% of deregistering firms in 2023 audit a U.S. issuer. These results highlight that many deregistering firms effectively withdraw from public issuer audits well before formally

[18] The reported patterns remain similar when relaxing the definition of 'active' to include audits of non-U.S. issuers or requiring firms to issue at least five audit opinions rather than one.

exiting the PCAOB registration system. Panel B of Figure 11 adopts a broader definition of audit activity that includes substantial roles in issuer or broker-dealer audits. This measure also reveals a declining pattern. In 2013, 68.0% of deregistering firms are active in audits one year before deregistration, but by 2023, this drops to 39.4%.

Overall, the results in Figure 11 reinforce the idea that deregistration is not necessarily indicative of a significant contraction in the number of audit firms actively auditing public issuers. Instead, the results suggest that a substantial portion of firms exiting the PCAOB registration system are inactive well before deregistering. Future research might explore whether these trends reflect voluntary exits due to diminishing demand for small audit firms, regulatory burdens increasing the costs to maintain registration, or strategic decisions by firms to operate exclusively outside the public issuer market.

6 Conclusion and Reflections

Our analysis provides novel and critical insights into the evolving landscape of auditing for U.S. public issuers and PCAOB registration dynamics over the past two decades. While aggregate measures suggest enduring prominence of the Big 4 audit firms, substantial underlying shifts emerge, particularly among Nasdaq-listed and OTC-quoted issuers, where smaller auditors markedly expand their presence. Further, we find a persistent decline in auditor switching, especially among larger issuers, which highlights increasing differences and potential inertia in auditor-client engagements. Examining PCAOB registrations reveals an initial surge due to regulatory intervention, yet subsequent contractions are driven primarily by exits of audit firms that are minimally involved with public issuers.

Collectively, our findings highlight the critical need to move beyond mere registration counts and toward evaluating firm-level audit activities when assessing the implications of regulatory change. This nuanced perspective is essential for informing meaningful policy discussions and guiding future research into auditor selection, issuer choice, and regulatory effectiveness.

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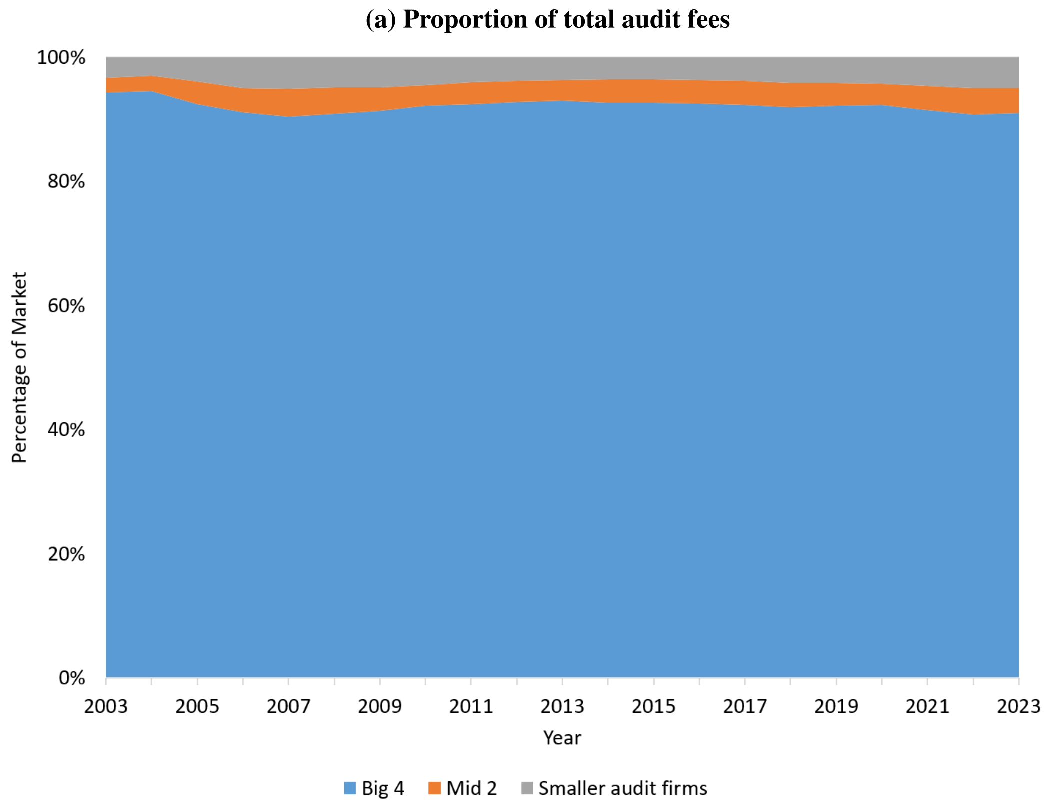


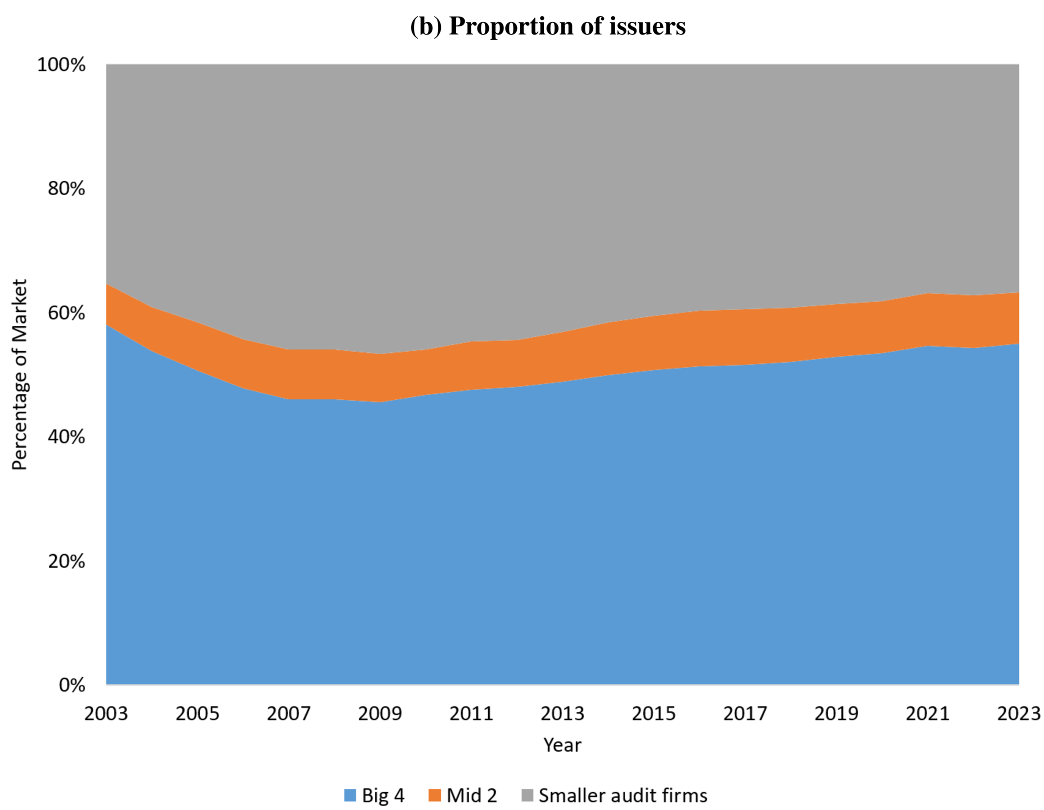


Figure 1: Proportion of Public Issuer Audits by Firm Size Over Time. These figures show the proportion of public issuer audits by firm size (Big 4, Mid 2, Smaller) over 2003-2023. We measure these using total audit fees (Panel A) and the number of public issuer audits (Panel B).

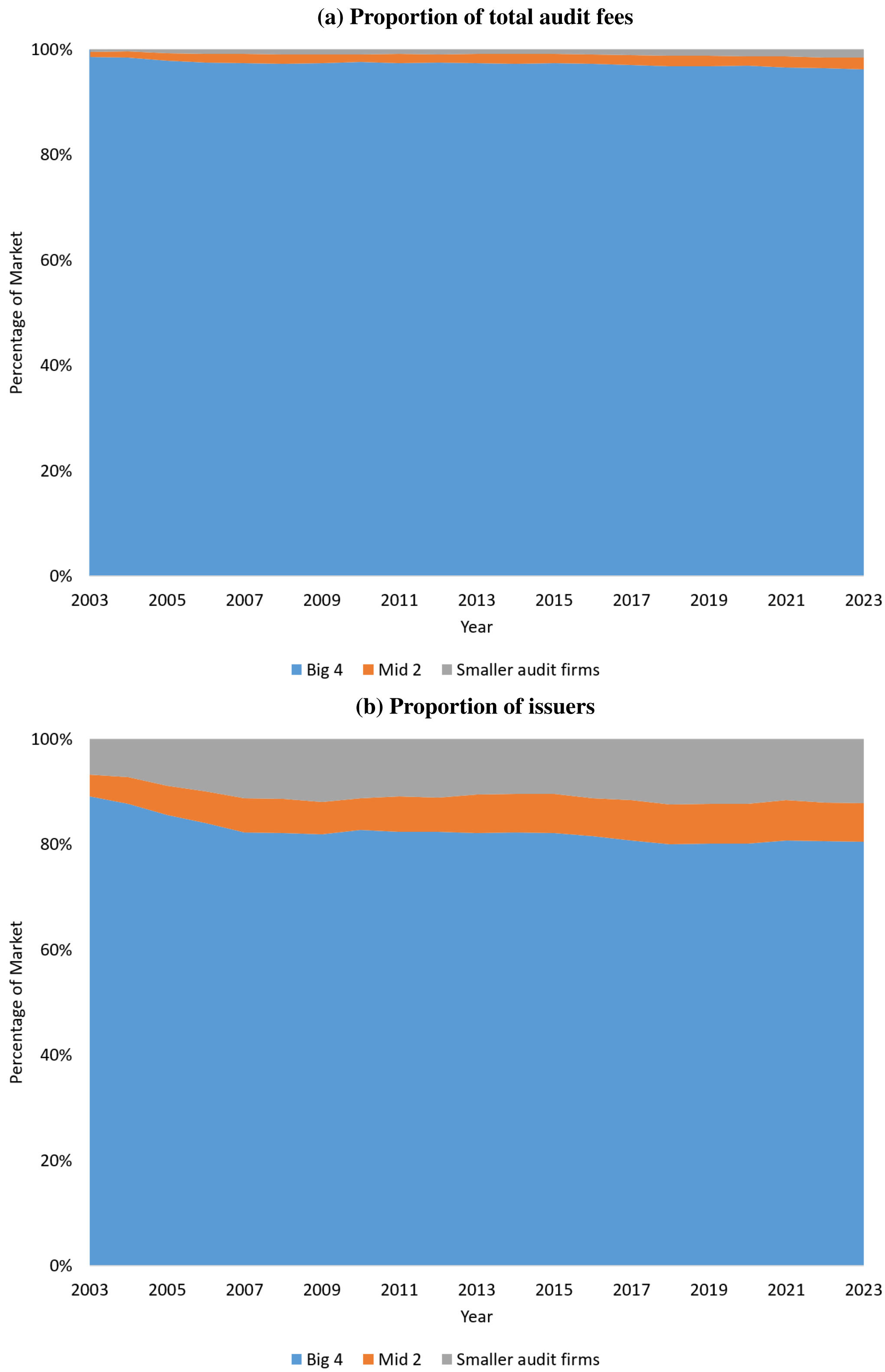
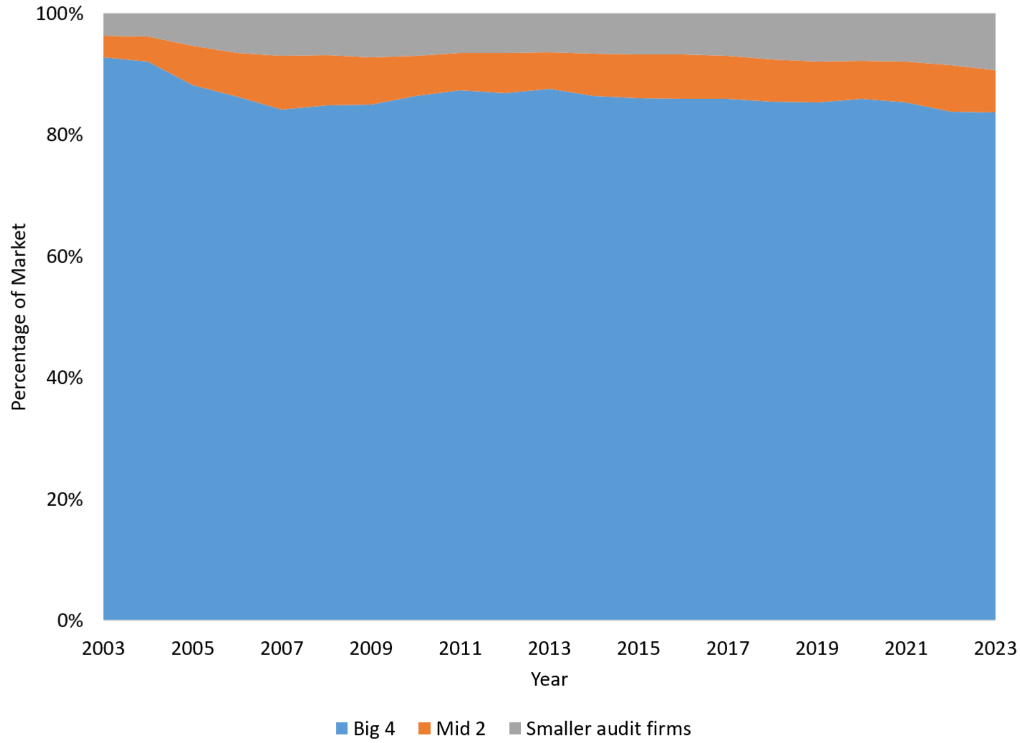


Figure 2: Proportion of NYSE-Listed Issuer Audits by Firm Size Over Time. These figures show the proportion of NYSE-listed issuer audits by firm size (Big 4, Mid 2, Smaller) over 2003-2023. We measure these using total audit fees (Panel A) and the number of issuer audits (Panel B).

(a) Proportion of total audit fees



(b) Proportion of issuers

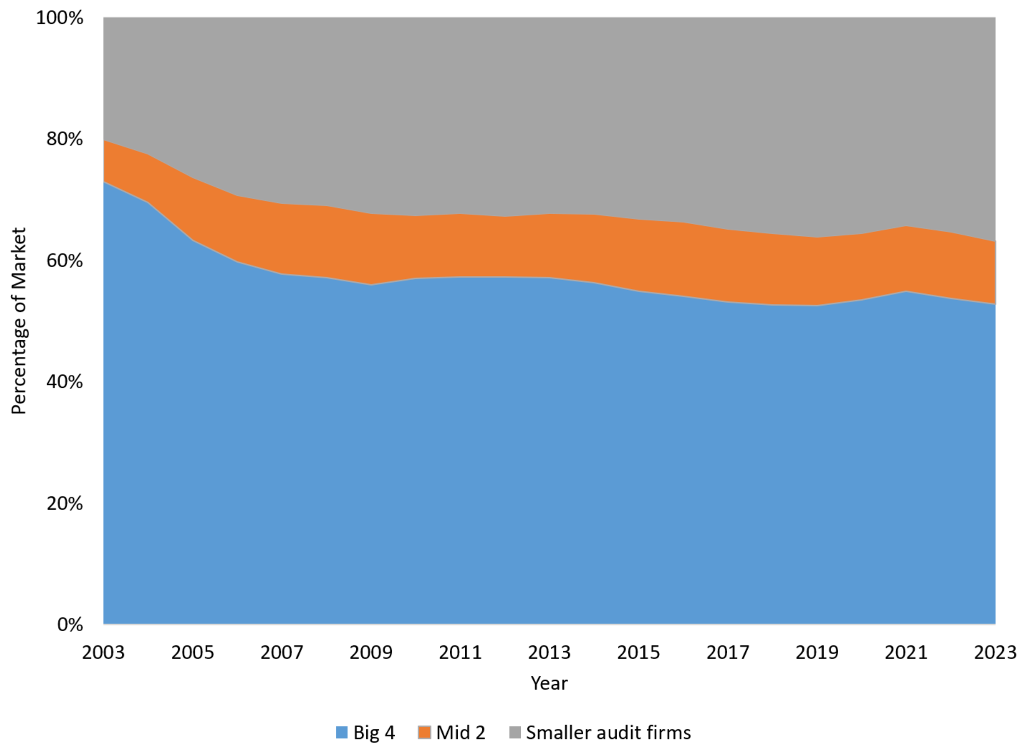
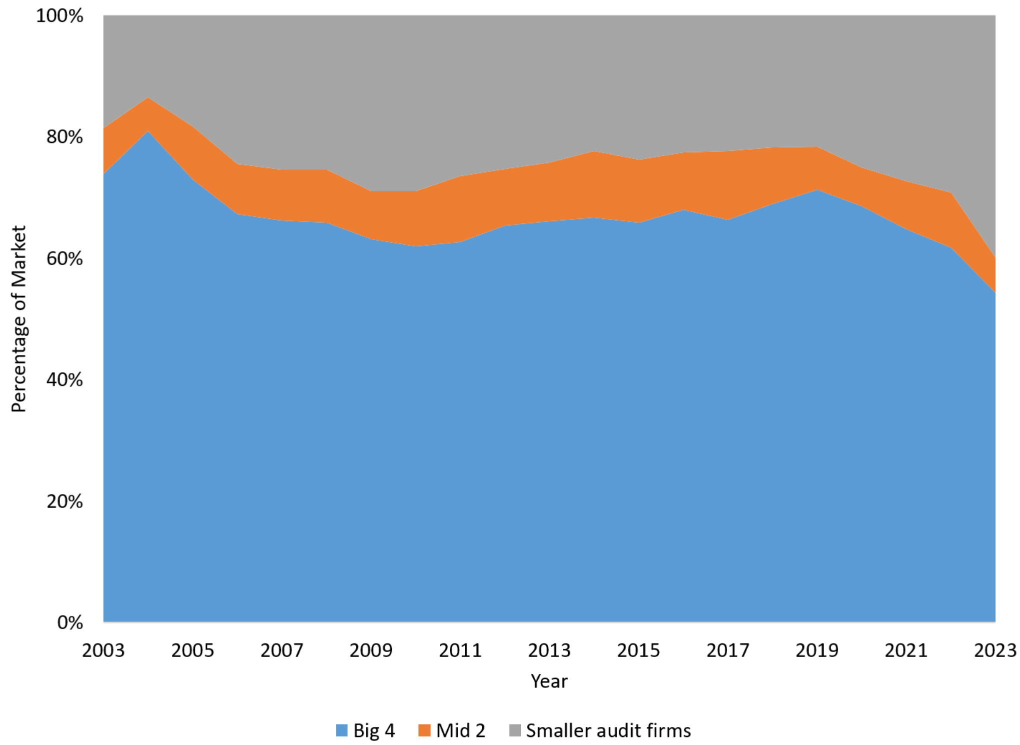


Figure 3: Proportion of Nasdaq-Listed Issuer Audits by Firm Size Over Time. These figures show the proportion of Nasdaq-listed issuer audits by firm size (Big 4, Mid 2, Smaller) over 2003-2023. We measure these using total audit fees (Panel A) and the number of issuer audits (Panel B).

(a) Proportion of total audit fees



(b) Proportion of issuers

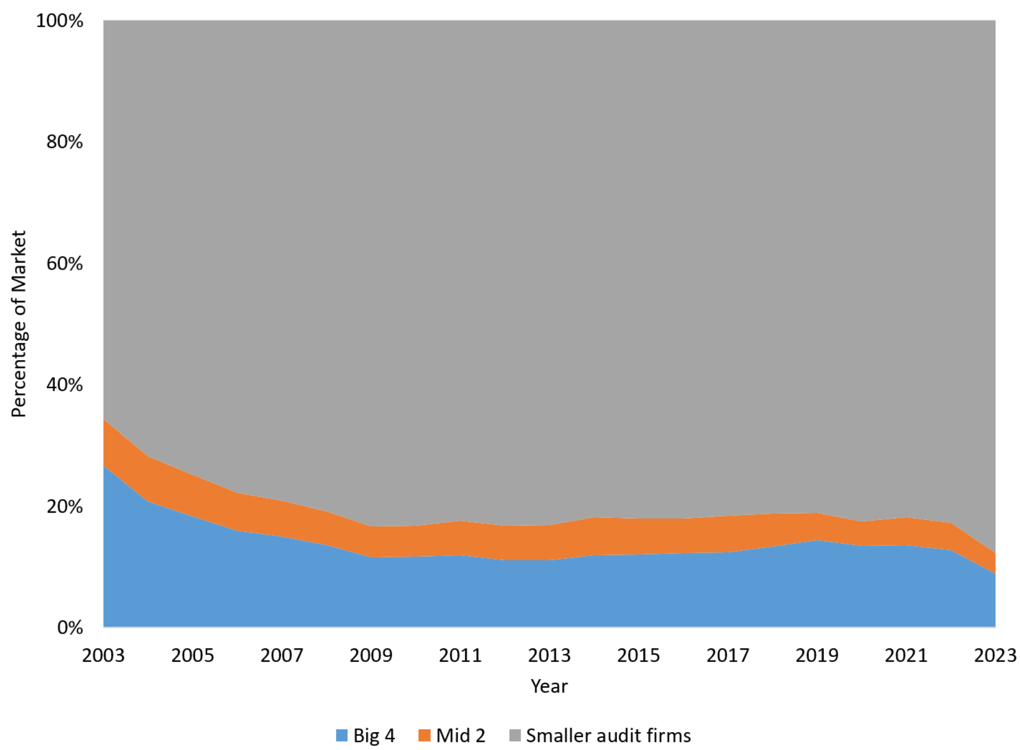


Figure 4: Public Audit Market Share for OTC-Quoted Issuers Over Time. These figures show the proportion of OTC-quoted issuer audits by firm size (Big 4, Mid 2, Smaller) over 2003-2023. We measure these using total audit fees (Panel A) and the number of issuer audits (Panel B).

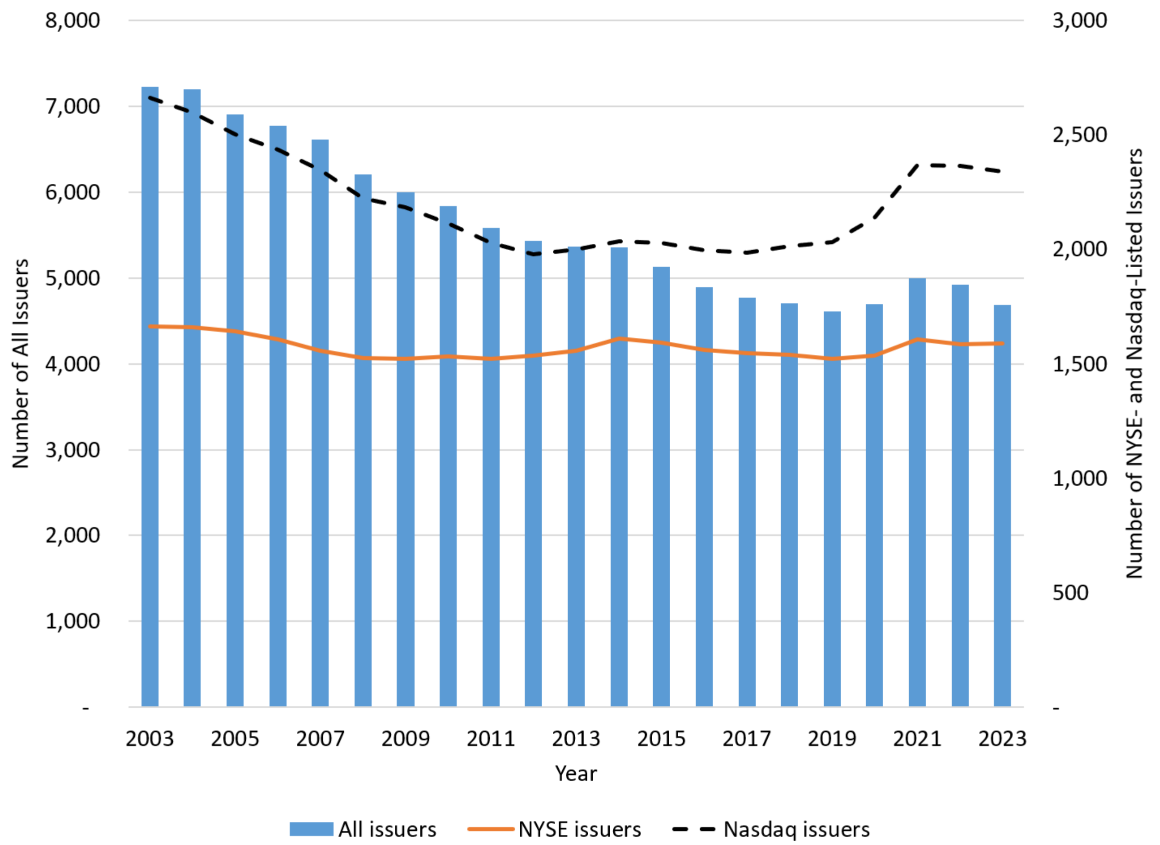


Figure 5: Issuer Counts by Trading Venue Over Time. This figure displays the number of issuers overall and by trading venue (all, NYSE, and Nasdaq) over time using the issuer count sample.

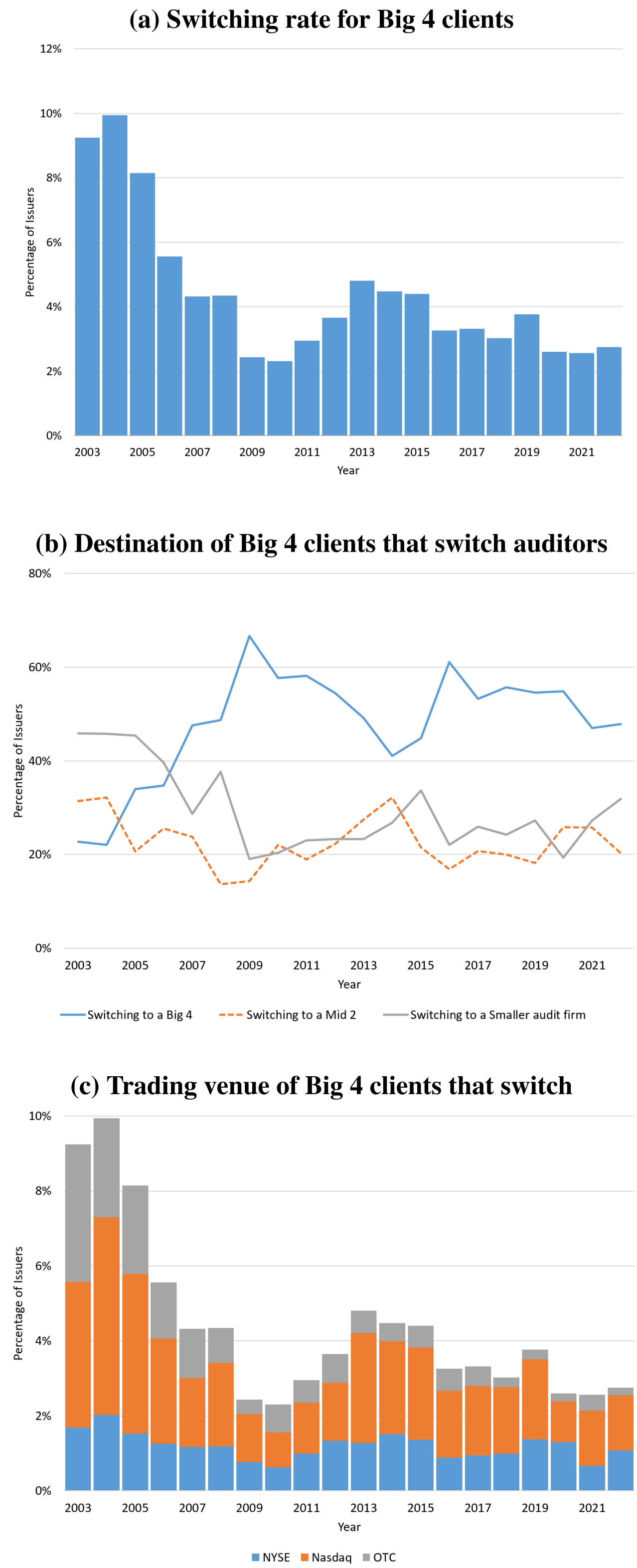


Figure 6: Switching Rate for Big 4 Clients. This figure plots the auditor switching rate among Big 4 clients (Panel A) and the distribution of new auditor choices—Big 4, Mid 2, or smaller firms—among those switching issuers (Panel B). Panel C displays the percentage of all Big 4 clients that switch auditors based on the venue where the issuer's stock is listed or quoted (NYSE, Nasdaq, or OTC).

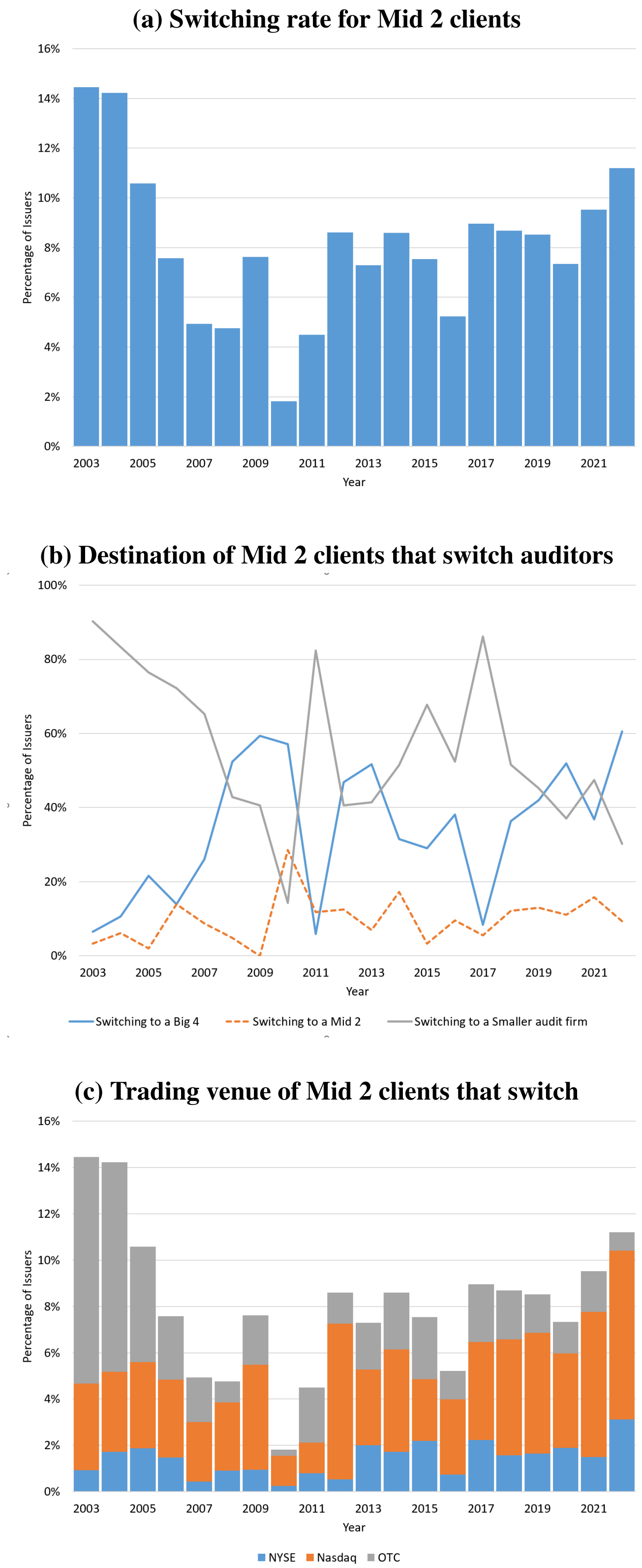


Figure 7: Switching Rate for Mid 2 Clients. This figure plots the auditor switching rate among Mid 2 clients (Panel A) and the distribution of new auditor choices—Big 4, Mid 2, or smaller firms—among those switching issuers (Panel B). Panel C displays the percentage of all Mid 2 clients that switch auditors based on the venue where the issuer's stock is listed or quoted (NYSE, Nasdaq, or OTC).

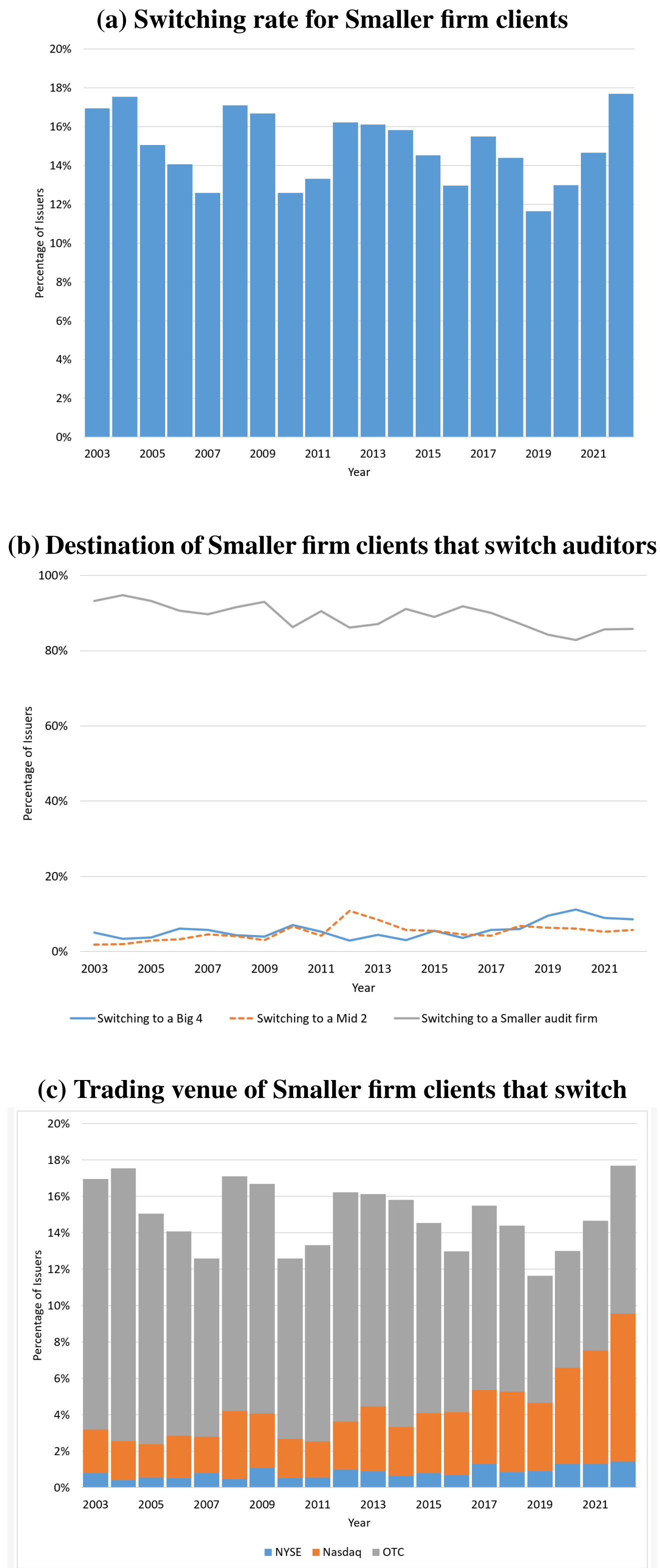


Figure 8: Switching Rate for Smaller Firm Clients. This figure plots the auditor switching rate among Big 4 clients (Panel A) and the distribution of new auditor choices—Big 4, Mid 2, or smaller firms—among those switching issuers (Panel B). Panel C displays the percentage of all smaller firm clients that switch auditors based on the venue where the issuer's stock is listed or quoted (NYSE, Nasdaq, or OTC).

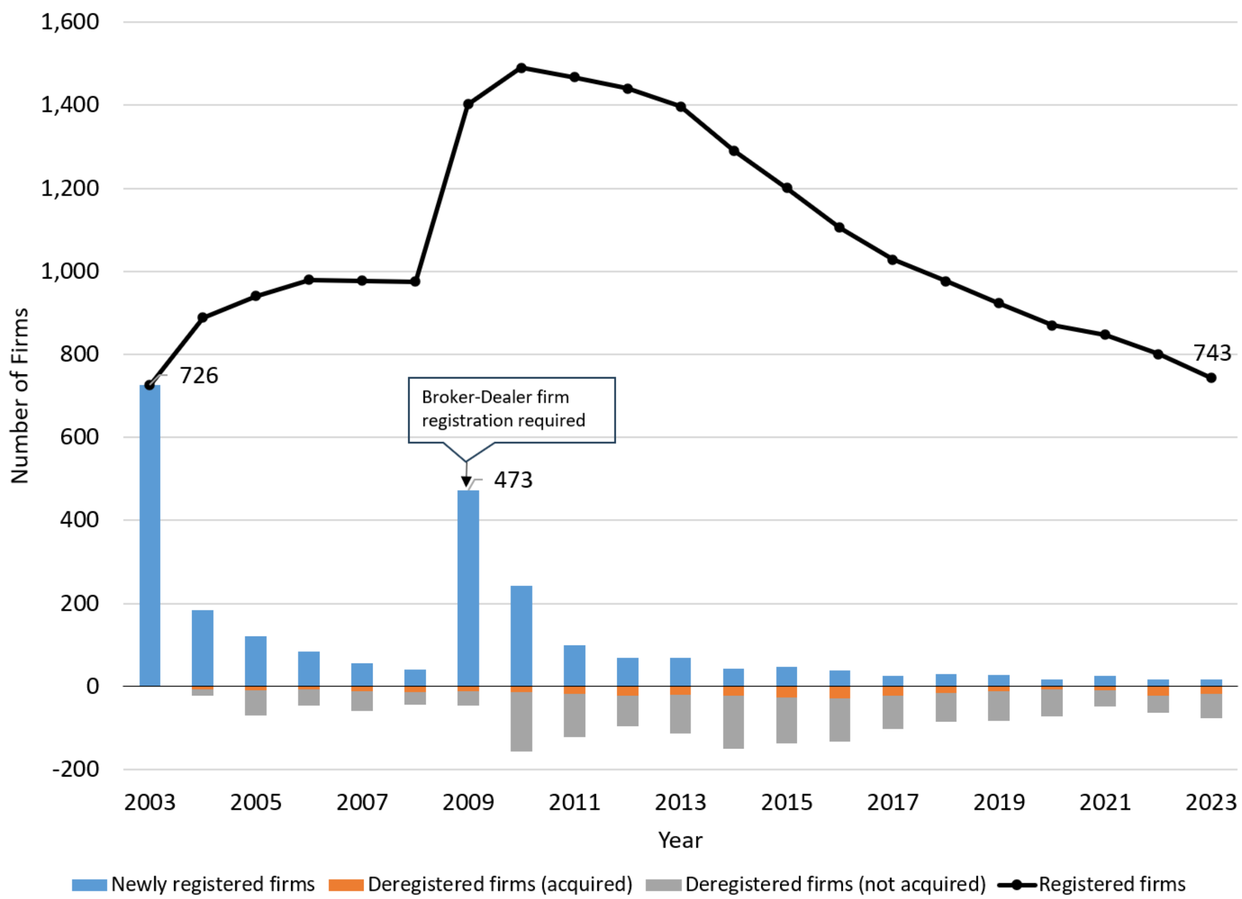


Figure 9: Audit Firm Registration Over Time. This figure displays the number of PCAOB-registered audit firms from 2003 to 2023, along with the annual number of new registrations and deregistrations. The blue bars represent new PCAOB registrations each year, the orange bars indicate deregistrations for firms that were acquired (where we define acquisitions as those occurring within a two-year window centered on the deregistration date), and the gray bars represent deregistrations by firms exiting independently. The black line is the total number of PCAOB-registered firms per year.

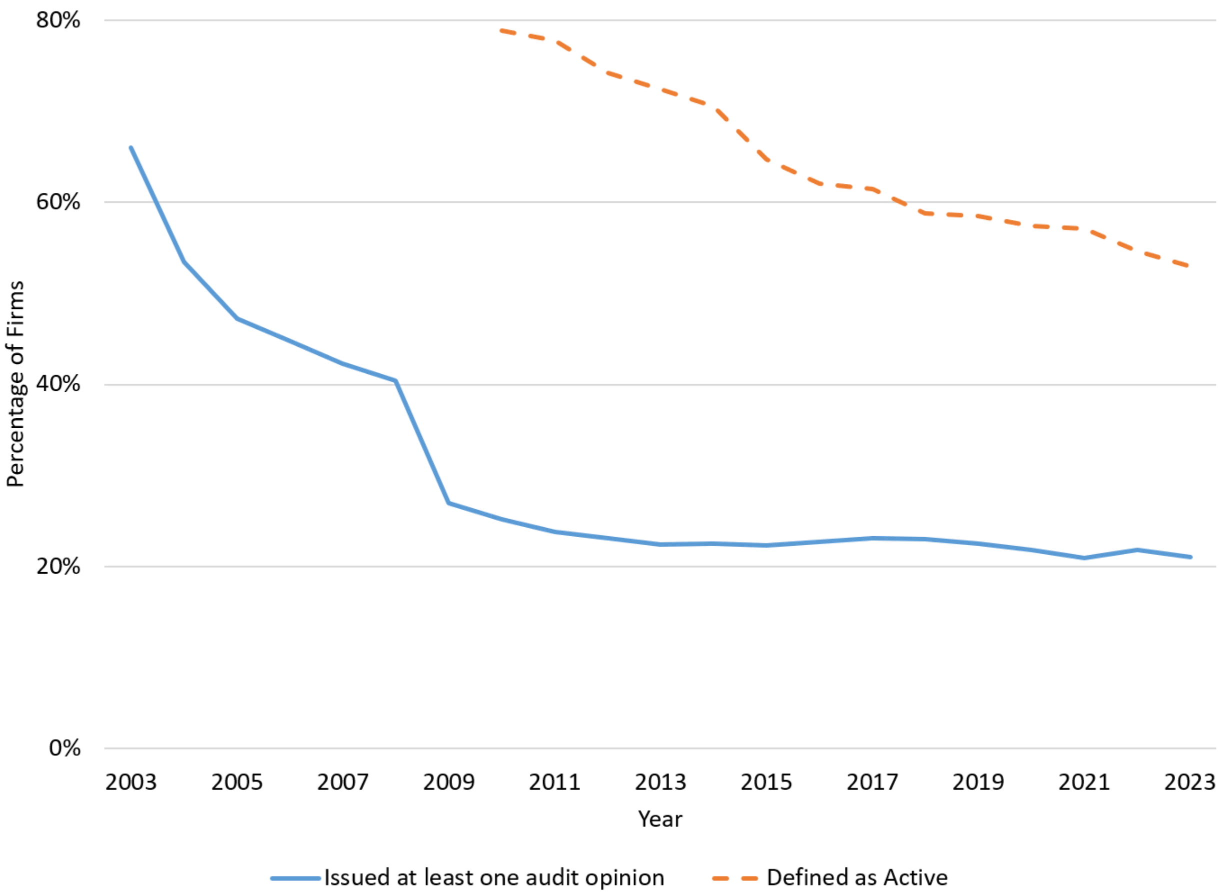
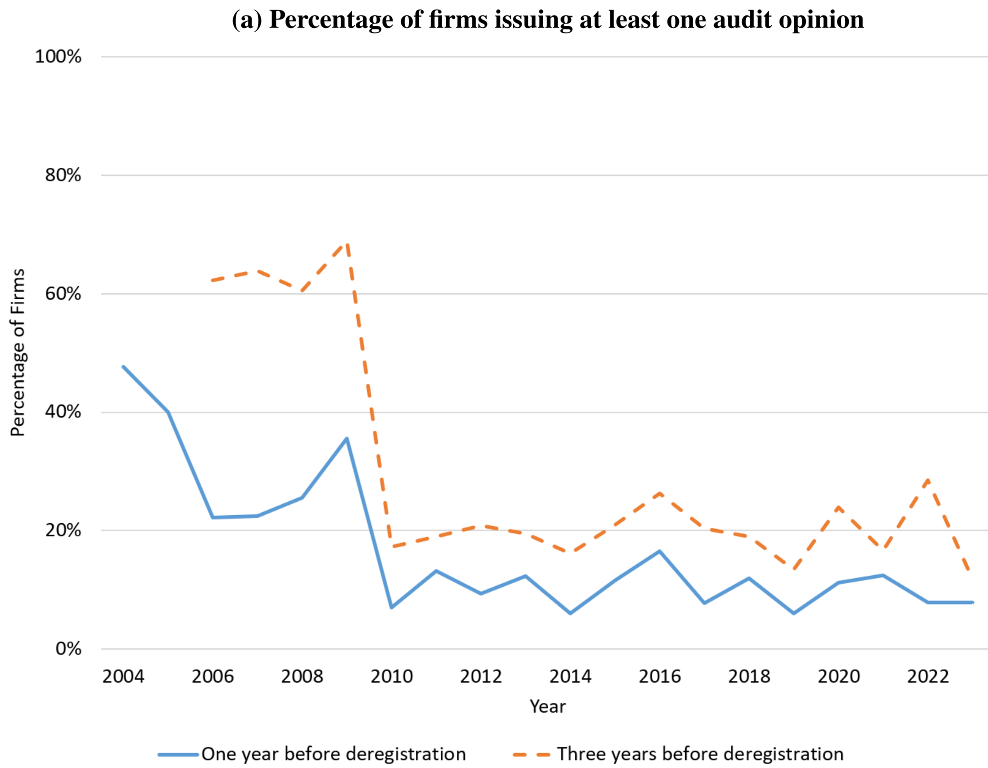


Figure 10: Registered Firm Activity Over Time. This figure plots registered firms with at least one U.S. auditor opinion (solid blue line); and those defined as active (dashed orange line). Active firms issued an audit opinion or played a substantial role in an issuer or broker-dealer audit.



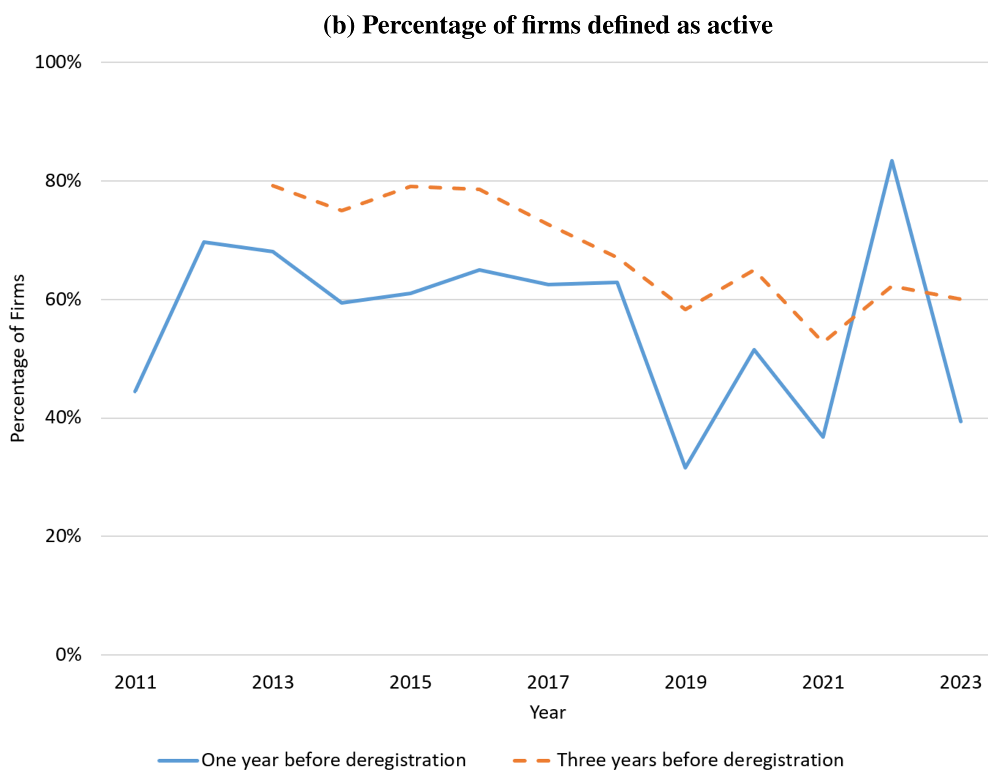


Figure 11: Deregistered Firm Activity Over Time. These figures show the activity of deregistered firms based on the percentage issuing at least one audit opinion (Panel A) or defined as "active" (Panel B) during the one (blue solid line) and three (orange dashed line) years preceding deregistration. Active firms either issued an audit opinion or played a substantial role in issuer or broker-dealer audits.