

Long term trends in Auditor Choice

ABSTRACT

The division of the market for audit services across the Big-4 (KPMG, PWC, D&T, and E&Y) and non-Big-4 (NB-4) auditors reflects both demand side effects (perceptions of higher Big-4 quality) and supply side effects (the difference in fees across these two auditor types). Using empirical evidence from long-term changes in Big-4 market shares over the period 2001-2015, we demonstrate a counter-intuitive result that a larger increase of audit fees by Big-4 auditors *relative* to NB-4 auditors results in a lower likelihood of switching to an NB-4 auditor. By analyzing switching behavior across different industries and client firm's asset quintiles, and by separating switches into resignations (auditor initiated or supply-side effects) as opposed to dismissal (client initiated or demand-side effects) we provide insights into the effects of different economic causes on the choice of a Big-4 auditor by client firms.

Keywords: Big-4, Audit Fees, Market Share

JEL Classification: M42, M48, D43

I. INTRODUCTION

The years between 2000 and 2015 witnessed many changes in the market for audit services. Large audit failures (such as Enron, Parmalat, and WorldCom) led to the enactment of the Sarbanes-Oxley Act (hereafter SOX) and the demise of Arthur Andersen (hereafter AA). In addition, a financial crisis in the years 2007-2008 led to a major restructuring of the economy. While audit fees rose sharply for all auditors across this period, the difference in fees between Big-4 and other auditors (hereafter, NB-4), usually referred to as the Big-4 premium, increased over the period 2000-2004 (Ghosh and Pawlewicz 2009), then decreased and stabilized over the period 2006-2012, and has started rising in recent years (Figure 1, Panel C).¹ Not surprisingly, higher relative fees led to lower market shares for the large auditors -- total market share of the Big-5/4 fell and that of NB-5/4 auditors rose across all industries and size quintiles (see Table 2).² Our main finding is that there exists an *inverse* relationship between Big-4 premium increases and the losses in market share. The greater the increase in the idiosyncratic fees charged to a client by a Big-4 auditor, the lower the probability that they will switch to an NB-4 auditor. We show, using an auditor choice model, that this empirical finding is consistent with significant demand-side shifts in the value of a Big-4 audit and inconsistent with a shift driven solely by an increase in audit cost and audit fees.

Both audit fees and market shares changed drastically over our sample period, 2000-2015 (Figure 1, Panels A and B). Perhaps the single biggest shock to the prevailing equilibrium during this period was the enactment of the Sarbanes-Oxley Act (SOX) in 2002. However, other events

¹ Big-4 auditors may increase fees but the change in the premium depends on how the NB-4 react to this fee increase. Hay and Knechel (2016) argue that the Big-4 premium is overstated using a meta-analysis technique. However, the studies analyzed in their paper do not use the residual approach to the premium that we employ in this paper.

² Papers that have documented fee increases following the enactment of SOX include: Asthana, Balsam and Kim (2009); Griffin and Lont (2007). Big-4 market share losses have also been noted in earlier literature though we could not find a systematic reference documenting the effects that are categorized in Table 2 of this paper.

such as the collapse of Arthur Andersen, the financial crisis of 2007-2008 and many regulatory changes such as the shift towards fair-values accounting (FASB's Accounting Standards Codification 820) led to the realignment of fees, auditors and clients over our sample period 2000-2015. We focus on SOX and the collapse of AA because the effects of these events on the market for audit services can be predicted from arguments of supply and demand (see Figure 1 Panel C). SOX increased both the fees and benefits of an audit whereas the collapse of AA reduced the supply of Big-4 audit capacity as well as creating doubts about the quality of Big-4 audits. SOX should have led to more intensive audits and higher fees for both Big-4 auditors and NB-4 auditors. The effect on market shares is less transparent and depends on the changes in audit premia and audit value across Big-4 and NB-4 auditors. In contrast, the collapse of AA should have led to a lower market share for Big-4 auditors (because of a fall in Big-4 reputation) but the effect on the Big-4 premium could be in either direction, increasing due to supply reductions, or decreasing because of lowered Big-4 reputation (summarized in Figure 1 Panel C).

Our theoretical development starts with the discrete consumer choice model as developed in McFadden (1973). That paper examines an individual's choice between public and private transportation systems. The transportation mode chosen will be the one that provides the largest net benefit, that is, the largest difference between the benefit and the cost. The model assumes that the consumer's utility for the transportation mode contains observable demographic factors and an unobservable personal utility component. Analogously, we assume that the individual firm's choice of a Big-4 audit will be based on the net difference between a partially observable benefit obtained through a Big-4 audit and the excess fee that is charged by the big auditor. The benefit accruing from a Big-4 audit contains both observable variable such as client-firm size or their levels of debt as well as an idiosyncratic component that is unobservable. In particular, this

approach allows us to linking switching behavior from a Big-4 to an NB-4 auditor with simultaneous supply-side effects (fee changes of Big-4 and NB-4 auditors) and demand-side effects (perceived value of a Big-4 audit). The major empirical contribution of our paper is to document a *negative* correlation between Big-4 audit premium increases and switching probability and explain this finding formally through an equilibrium choice model (details in Section II.1).

The economic theory of the value for public audits focuses on the fact that audit quality is not observable by investors either before or after the use of audited information (that is, audit services are credence goods (Causholli and Knechel 2012)). The unobservability of audit quality leads to a theoretical prediction of two components that underlie the Big-4 premium – (i) a (partial) recapture of the market value to the client-firm associated with a better Big-4 reputation and (ii) a (partial) recovery of greater expected litigation payouts that act as the implicit guarantee of better-quality audits by the Big-4 (Dye 1993). In a competitive equilibrium with two different types of auditors, the smaller less-wealthy auditor will (endogenously) choose to provide lower-quality audits for lower fees and a smaller set of clients (Bar-Yosef and Sarath 2005). These theoretical conclusions have been validated empirically in many different contexts.³

An increase in the fee-difference between Big-4 and NB-4 auditors has a direct effect of making the Big-4 auditor less attractive (increase in switching probability to NB-4). However, under an assumption that the private benefits are unobservable, raising fees has an indirect effect of identifying clients who attach high value to a Big-4 audit and who are less likely to switch to an NB-4 auditor. Using our theoretical model, we are able to demonstrate that a suitable change in

³ The existence of a Big-4 premium is now a standard feature of Audit Fee models as documented in the next section. There is a considerable stream of empirical literature attempting to document the market value generated by Big-4 auditors. For example, Beatty (1989) associated Big-8 auditors with reduced underpricing for their clients at the time of Initial Public Offerings. Teoh and Wong (1993) found the earnings response coefficient (ERC) is higher for firms audited by Big-4. Pittman and Fortin (2004) and Mansi, Maxwell, and Miller (2004) suggested that debt financing costs are lower for firms audited by Big-4. Khurana and Raman (2004) showed that the ex-ante cost of equity capital is lower for firms audited by Big-4 than for firms audited by NB-4 audit firms.

the (unobservable) benefits of a Big-4 audit (demand-side effect) is a necessary condition to ensure a negative correlation between fee increases and switching probability. We reinforce this inference by showing that the negative correlation only exists in the sample of auditor dismissals (demand-side decision) but not in auditor resignations (supply-side decisions). Additional support is provided using prior (2000) NB-4 market share and prior-AA market share (2001) as instrumental variables associated with demand-side shifts over the period 2003-2015.

We first construct measures of a firm-specific Big-4 abnormal fee by combining the audit fee model in Blankley, Hurtt, and MacGregor (2012) with industry dummy variable (see Ashbaugh, LaFond, and Mayhew 2003) for the industry analysis. The residual from the regression is classified as a firm-specific abnormal fee. Following the arguments about the choice of transportation methods developed in Domencich and McFadden (1975) and expanded in Amemiya (1981), a firm will switch to an NB-4 auditor if the unobservable benefits are less than the firm-specific fee residual. To explain more carefully, we assume that each year, the firm assesses whether it should stay with their current Big-4 auditor or switch to an NB-4 auditor. This assessment is based on a comparison of the fees from last year with the perceived benefits of a Big-4 audit. The firm will stay with their current Big-4 auditor if their assessment of the incremental benefits of a Big-4 audit is greater than the fee premium charged in the prior year. In particular, if the premium increase was large last year while the incremental benefits of Big-4 audit stayed constant, it is more likely the firm will switch to an NB-4 auditor.⁴

To test this relationship on switching to NB-4 auditors, we use the abnormal fee residual from the audit fee regression as an additional explanatory variable in the auditor switching model

⁴We note that from an empirical perspective, we estimate a single Big-4 premium across all the years and a change in the premium is the same as a change in the residual. Of course, the firm could also switch to another Big-4 auditor who charges a lower fee. We exclude such switches from our analysis, but we note that they form a relatively small proportion of switches (7.16%).

developed in Landsman, Nelson, and Rountree (2009). In particular, we use the “mismatch” variable as a control for other factors that might also drive switching behavior. Our empirical findings are that after controlling for fee and other effects, firms that faced a *larger* increase in Big-4 premium (over the previous year) are *less* likely to switch to a NB-4 auditor in the following year. In addition, this finding holds only in the sample of auditor dismissals but not in the auditor resignation sample. This finding suggests that changes in client-firms’ preferences for Big-4 audits, not Big-4 fee premia, are driving the switching behavior. Firms that have a stronger preference for Big-4 audits are staying with them despite higher fees while firms that attach less benefits to a Big-4 audit are switching away despite the fact that they are being charged lower fees.

As another method for examining demand driven switches, we use the industry share of NB-4 *in 2000* as an instrumental variable. The underlying assumption is that this variable reflects the preference (or the lack thereof) for Big-4 auditors in the period before 2001 and that it is correlated with changes in preferences across Big-4 and NB-4 auditors in the period 2003-2015, but not with the fee changes in this period. We find that this instrumental variable is negatively related to switching, that is, the shift in preferences towards NB-4 was greater in industries where they were least favorably viewed in 2000.

We also conduct tests for demand shifts on a quintile-by-quintile (firm-size) basis. The logit model shows that the negative effects of residual fees and NB-4 2000-market share on switching behavior are significantly negative in size quintiles 3, and 4 where there is active competition between the Big-4 and NB-4 for clients, but are not consistently significant and negative in the lowest and highest quintiles. In other words, the changes in demand and supply side strategies over 2003-2015 which we document are primarily centered around medium sized firms but less applicable to the smallest firms that have historically provided clientele for NB-4 auditors or the

largest firms where there may be other barriers to hiring NB-4 auditors. Our results provide a significant contribution to the literature regarding post-SOX changes in auditor fees (e.g., Asthana, Balsam, and Kim 2009) as well as market-wide studies of the audit industry that are typically analyzed from either the client-firm side (e.g., Ettredge, Li, and Sun 2006) or the auditor side (such as Gu, Simunic, and Stein 2019) but do not analyze strategic behavior from both auditors and clients.

The remainder of the paper is organized as following: Section II discusses related literature, Section III shows hypotheses development. Section IV presents the sample, methodology. Section V discusses the results. Section VI reports the sensitivity tests. Section VII offers concluding remarks.

II. RELATED LITERATURE

We first review prior literature on the effects of Big-4 premium and then the literature pertaining to effects of SOX and AA's collapse on the post-SOX market share held by the Big-4. Cross-sectional differences in audit fees can represent either the effect of quantity differences (in terms of hours of audit) or price differences in terms of hourly fee (Simunic 1980a). Empirical documentation of a "Big-N" auditor premium goes back at least to Francis (1984) study of the Big-8 accounting firms of that time. Palmrose (1986) finds that the Big-8 audit firms charge higher audit fees and explains it as arising from their monopoly powers. In contrast, Beatty (1989) argues that perceptions of higher audit quality led to better pricing of IPO's audited by the Big-8. We use the model in Blankley et al. (2012) to estimate the fee differential or "premium" charged by Big-4 auditors and study the effects of the *change in the premium* on the propensity to switch to an NB-4 auditor.

Audit quality is difficult to define and even harder to measure using public data (Dopuch and Simunic 1980; Causholli and Knechel 2012). Several theoretical studies argue that uncertainty over audit quality leads both investors and client-firms to attach greater value to the audits supplied by reputable and/or wealthy auditors (Datar and Alles 1999; Dye 1993; Bar-Yosef and Sarath 2005; Sarath 2016). Many empirical studies support the broad conclusions regarding audit quality derived in the theory literature. Blokdijs, Driehuisen, Simunic and Stein (2006) find that NB-4 audit firms are less effective in their work than Big-4 firms supporting the claim of higher Big-4 audit quality in equilibrium.⁵ A 2006 GAO (Government Accountability Office) report suggests that auditees don't want to be audited by NB-4 firms because of the recognized difference in reputation. Assuming that client-firm makes rational choice of auditors (Danos and Eichenseher 1986), a Big-4 auditor will be chosen if the perceived benefit of a Big-4 audit (over an NB-4) is greater than the associated fee differential. We adapt a standard model of consumer choice over modes of transport (McFadden 1973) to structure our analysis of rational auditor choice.

Danos and Eichenseher (1986) indicate a general movement to the Big-8 across all client firms from 1973 to 1980 as do Ferguson, Pinnuck and Skinner (2014). Both papers argue that the observed change in market share reflects a long-term adjustment to a fairly stable equilibrium distribution of clients across large and small audit firms. In contrast, the enactment of SOX and the collapse of AA, along with other regulations concerning the quality of information reaching the financial market, disrupted supply and demand patterns in the audit market. We draw on the evidence in Choi, Doogar, and Ganguly (2004) about changes in Big-4 pricing strategies due to

⁵ It is very important to clarify that this observation does not say anything about the audit production technology but rather about the equilibrium choices of quality by Big-4 and NB-4 auditors based on market forces and the unobservability of audit quality. Bar-Yosef and Sarath (2005) documents stronger market reactions to Big-4 audits under an assumption of identical production capabilities for Big-4 and NB-4 auditors. Any assumed production advantage for the Big-4 (economies of scale or scope) will only enhance the value of their audits.

increased risk and Cassell, Giroux, Myers, and Omer (2013) that SOX, AA collapse, and the creation of PCAOB have strengthened NB-4 auditors' competitive position. We then study both these effects within an integrated empirical framework and interpret our results using a rational auditor choice model. As an empirical control for other factors that may induce a client firm to switch auditors, we use the "mismatch" score developed in Landsman, Nelson and Rountree (2009) as an empirical control.

Studies that analyze long-term trends in audit fees and market include Menon and Williams (1991), and Maher, Tiessen, Colson, and Broman (1992). These studies document declining fees from 1977-1981 because the profession dropped many of its restrictions against competition and a significant increase in 1988 because The Auditing Standards Board issued the "expectation gap" standards. Menon and Williams (1991) also mention that Big-8 mergers had a short-run, instead of a long-run, effect on fees. Studies that analyze both fees and market shares include Ferguson, Pinnuck and Skinner (2014), Gu, Simunic and Stein (2019), and Chu, Simunic, Ye and Zhang (2018). Ferguson et al. (2014) argue that increasing concentration with the Big-4 in the Australian audit market may be a natural evolutionary trend. Gu et al. (2017) and other related studies, such as Chu et al. (2018), and O'Keefe, Simunic and Stein (1994), focus on the auditor's strategic decisions as the primary driver of fees and market shares. Our study complements this stream of research in that we focus on the client-firm's decision to retain the Big-4 after the fees have been set (optimally) by the Big-4 and NB-4 auditors.

The collapse of AA also had a significant impact on the audit market particularly in the period 2002-2003. Several prior studies have examined the switching behavior of Arthur Andersen clients (e.g., Blouin, Grein, and Rountree 2007). While the reputation of AA suffered, Krishnamurthy, Zhou and Zhou (2006) find that firms which were former audit clients of Andersen and then

switched to other Big-4 signaled high firm quality by staying with a Big-4 auditor. We argue that despite such factors, former AA clients should attach less weight to Big-4 value and should be more likely to switch to NB-4 auditors after controlling for audit fee changes. We test this proposition by using AA-market share as an instrumental variable that is correlated with perceptions of Big-4 quality in 2003-2015 but uncorrelated with the fee structure in that period.

II. 1 A MODEL OF BIG-4 AUDITOR CHOICE

We adapt the model of consumer choice of transportation methods (Domenich and McFadden 1975; Amemiya 1985) to provide a framework for developing our hypotheses. In doing so, we simplify production issues that are emphasized, for example, in O’Keefe, Simunic and Stein (1994), and assume that both Big-4 and NB-4 auditors are viable choices for all client-firms. We assume that the fees are set competitively by NB-4 auditors based on their production costs while Big-4 auditors set a premium in addition to the fees charged by NB-4 auditors. More formally, if q_1, \dots, q_n are observable factors that affect the cost of an audit for firm i at time t , we assume that all NB-4 auditors offer a competitive fee $F_{it}(q_1, \dots, q_n)$. The Big-4 auditor then sets a fee $F_{it}(q_1, \dots, q_n) + \pi_{it}$. Given this fee structure, the client-firm must choose whether to stay with their incumbent Big-4 auditor or switch to an NB-4 auditor.

Consider this choice problem for a single firm, i , that is trying to decide whether to stay with its current Big-4 auditor or switch to an NB-4 auditor in year t . We denote firm i ’s difference in utilities between a Big-4 auditor and an NB-4 auditor in time-period t by ΔU_{it} . Let π_{it} denote the Big-4 premium charged to firm i in period t . We model a firm as deciding to look for a new

auditor based on a comparison of the fee-premium it was charged last period⁶ and its utility for the Big-4 auditor *this* period, that is the firm's decision is to switch if:

$$\Delta U_{it} < \pi_{it-1} \quad (1)$$

As the firm chose a Big-4 auditor in year $t-1$, it follows that:

$$\Delta U_{it-1} > \pi_{it-2} \Leftrightarrow \Delta U_{it-1} = \pi_{it-2} + \varepsilon \quad (2)$$

where ε is unobservable and is drawn from some random distribution $\tilde{\varepsilon} \geq 0$. Assuming that the (relative) preference for the Big-4 auditor does not change, that is, $\Delta U_{it} = \Delta U_{it-1}$, and a switch takes place in year t , combining (1) and (2) gives:

$$\Delta U_{it-1} = \pi_{it-2} + \varepsilon = \Delta U_{it} < \pi_{it-1} \Leftrightarrow \varepsilon < \pi_{it-1} - \pi_{it-2} \quad (3)$$

Therefore, the probability that the client-firm will switch to a new auditor in period t can be denoted as:

$$\text{Probability} \{ \tilde{\varepsilon} < \pi_{it-1} - \pi_{it-2} \} \quad (4)$$

and it is clear that this probability is increasing in $\pi_{it-1} - \pi_{it-2}$. We summarize the outcome of the economic intuition derived from our model:

If switching is driven by the supply side (that is, by changes in auditor fee increases) but not by the demand side (changes in benefits of going to a Big-4 auditor), the probability of switching from a Big-4 auditor increases in the (lagged) premium change.

HYPOTHESES DEVELOPMENT

⁶ This formulation is made partly for empirical reasons since the premium cannot be measured for year t if the firm switches to an NB-4 auditor in year t . It can be viewed as a decision to seek a new auditor in the middle of the year where last year's premium is the best proxy for what the firm will be charged this year.

We outline again the basic economic factors that underlie our study. The total market demand for audit services is (almost) inelastic with regard to audit fees,⁷ so an increase in the Big-4 premium should result in a reduction in market share for Big-4 auditors and an increase for NB-4 auditors. However, such a market share reduction could be further enhanced if the competitive position of NB-4 auditors has been strengthened due to SOX or other regulatory changes. We abstract away from within Big-4 competition and view this as a two-firm Oligopoly Equilibrium with the Big-4 acting as leaders and NB-4 as followers (Vives 1999, p. 200–205). Firms are willing to pay a Big-4 premium as they recover the costs through a better price in the stock market or through a lower cost of debt. The main focus of our analyses is to try and find evidence for stronger market competition from NB-4 auditors post-SOX after controlling for auditor-fee (supply side) effects.

Our first hypothesis is associated with the probability of switching from a Big-4 firm to a NB-4 firm in the period 2003-2015. If fee strategies chosen by the Big-4 are the main factor driving the switch to NB-4 auditors, we would expect that firms that are being charged a higher premium by the Big-4 (in the prior year) are more likely to switch to NB-4 auditors. In contrast, if switching is due to changes in the relative value of Big-4 audits as compared with NB-4 audits the relationship is not predictable and depends on the relative sizes of the premium change and the preference shift. This is the intuition from our model that if the relative benefit of a Big-4 audit stays constant, the probability of switching increases in the premium increase. In alternative form, this may be stated as:

⁷ The cost of going private and avoiding the need for an independent audit generally involves costs that are much larger than audit fees, so the effect of an increase in audit fees on the total number of publicly traded firms is generally small.

H1: There were changes in the preference for a Big-4 auditor as compared with an NB-4 auditor over the period 2003-2015, and consequently, a negative association between Big-4 premium increases and the probability of switching to an NB-4 auditor.

Since our argument is based on client-firm utility, it should be expected to hold up only in the sample of client-initiated auditor changes, that is, auditor dismissals. If a firm is willing to tolerate a premium increase, we would not expect the auditor to resign from the engagement since the firm is willing to compensate the auditor adequately for the audit risk. Combining these two arguments, we have, in alternative form:

H2: The negative association between Big-4 premium increases and the probability of switching to an NB-4 auditor should hold only for auditor dismissals but not for auditor resignations.

Our remaining hypotheses are based on creating an instrument that is likely to be correlated with relative preferences for a Big-4 auditor but uncorrelated with the fee increases that take place after 2003. The first instrument we select is the market share of NB-4 auditors prior to SOX in different industries. Although strictly speaking, we should use NB-5 for the pre-2001 period, the actual auditors identified in this group are exactly the same as those that would be counted as NB-4 today so we refer to them as NB-4. We assume that lower NB-4 market share pre-SOX in a particular industry reflects a greater preference in that industry for a Big-4 audit. For this reason, the 2000 NB-4 market share may be strongly associated with changes in preferences for a Big-4 audit post-SOX but only weakly associated with the fee increases of the Big-4 in that period. Since we have only an association argument here and no specific direction, our third hypothesis in alternative form is:

H3: NB-4 market shares in each industry in 2000 significantly influences switching probability over 2003-2015

Our last hypothesis is similar to our third hypothesis and uses AA's market share in that industry in 2000 as an instrument. This is a weaker instrument than NB-4 industry market share as the collapse of AA could increase the oligopoly power of the Big-4, while at the same it diminishes the perceived benefit of a Big-4 audit, and so the AA market share may be associated both with Big-4 premium increases and with changes on preferences regarding the quality of a Big-4 audit. This leads to our last hypothesis:

H4: AA's clients behave differently from non-AA clients with regard to their switching behavior over 2003-2015.

SAMPLE AND METHODOLOGY

Sample and Descriptive Statistics

The initial sample collected from Audit Analytics covering the period from 2000 to 2015 includes a total of 197,852 firm-year observations. If a client has two or more auditors in a sample year (but did not change auditors), we only keep the main auditor for the specific year. Therefore, we have a single audit-fee observation for each client firm for each year. Next, we merge with Compustat to collect financial data. We deleted 114,377 observations because the financial data was not available. In addition, 661 observations without information about business segments are also deleted. We use the industry analysis methodology of Ashbaugh et al. (2003) and eliminate the financial services industry (SIC 6000-6999) losing 8,283 observations in this process. Our final sample for the audit fee model consists of 74,531 firm-year observations. A total of 11,801 firm-

year observations are before 2003, while 62,730 firm-year observations are after 2002. In the final step, we exclude firm-years with missing Compustat data in the auditor switch model and as a consequence, 22,676 observations are deleted. In addition, we delete 20,415 observations which are not audited by Big-5/4 auditors in 2002. We focus on the sample in which the firms switch just once, so after the firms switch from a Big-5/4 auditor to an NB-5/4 auditor, we do not include them in the years after the switch. In this process, 1,564 firm-year observations are dropped from the sample. Our final sample for the audit switching model consists of 29,876 firm-year observations, of which 6,355 observations are before 2003 and 23,521 observations are after 2002. Table 1 describes the sample selection process.

[Insert Table 1 Here]

In Table 2, we summarize statistics about the market share of NB-4 auditors across time. This is the background against which we analyze supply and demand effects that lead to firms changing from Big-4 auditors to NB-4 auditors. While the data presented in this table has antecedents in prior literature, we could not find a suitable reference highlighting the clear and strong trend of increasing NB-4 market share over the period 2003-2007 followed by a fairly steady pattern over the years 2008-2015.⁸ The fact that the market shares across Big-4 and NB-4 are fairly steady over six years suggests that a new equilibrium has emerged in the market for audit services. Panel A shows the increases in the size of NB-5/4 firms over the period 2000-2015. The panel shows that NB-5/4 firms grow rapidly in the years 2000-2003 when they absorbed the former clients of AA but this expansion reverses somewhat in the period 2004-2008 but picks up again a little in the period 2008-2015 (see also Figure 1 Panel A). This pattern is consistent with a demand-side shift since the majority of AA clients would have switched to the surviving Big-4 auditors. Further, the

⁸ Perhaps firms don't want to change auditors during the Financial Crisis.

shift to NB-4 is not concentrated in just the Second-Tier auditors⁹ and spread broadly across all NB-4 firms (Compare Table 2, Panels A & D). To confirm the overall trend of these changes, we also classify market shares by asset-size quintiles. Table 2 Panel C shows that the Big-4 lost significant market share in every quintile except the largest one. In particular, the trend holds up broadly in asset quintiles 1, 2, 3, 4 and suggests that the market share loss is a major consequence of the shocks to the market equilibrium in the years 2000-2009.

Our analysis focuses on switching from Big-4 to NB-4 and our sample uses all firms that were with Big-4 auditors in 2002. If one of these firms switches to a NB-4 auditor, it can no longer be considered a candidate for switching from the Big-4 to NB-4 unless they switch back to a Big-4 auditor within the sample period. There is no such observation in our sample and so a firm that switches to a NB-4 auditor in year t , it is entered as a switch firm in year t and drops out from the sample in all years after $t+1$. For similar reasons, we do not include a firm that switches to a Big-4 firm from a NB-4 firm in the years 2003-2015. The probability that such a firm will switch back to a NB-4 firm again is likely to be different from that of firms that started in the sample in year 2002; so, including them in the sample is problematic (there are only 162 instances within our sample period).

[Insert Table 2 Here]

[Insert Figure 1 Here]

⁹ According to Cassell et al. (2013), the second tier auditors are: Grant Thornton LLP, BDO Seidman LLP, and McGladrey & Pullen LLP.

Methodology

Our methodology involves a two-step approach. In the first step, our goal is to construct a measure of the “firm-specific premium” charged by Big-4 auditors in each year. Then, our second step is to see how increases in the premia affect the propensity of client firms to switch to NB-4 auditors. We also analyze whether two other instruments that we propose significantly influence switching probability. The first instrument is the NB-4 market share in each industry prior to 2001. This measure is correlated with the relative preference for Big-4 in that industry. It is reasonable to suggest that it is also correlated with preferences for Big-4 in the test period 2003-2015 but is not correlated with the error term in the switching probability regression. The GAO (2006) report suggests that audit firms are more sensitive to client risk after Arthur Andersen collapsed; so, we expect that Big-4 auditors increased the premium more for clients with high-risk characteristics. However, as shown in Equation (3), assuming that the benefits from going to a Big-4 auditor did not change (or did not increase commensurately with the premium increase), companies with a greater premium increase are more likely to switch to NB-4 auditors. In addition, if Big-4 fee strategies are mainly driving switching behavior, we should see no influence of NB-4 competitiveness on switching behavior (H3). For similar reasons, we also test whether AA’s 2000 market share influences the probability of switch (H4).

The first step is to measure a Big-4 premium. Theoretically, for each firm audited by a Big-4 auditor, we need to estimate what a NB-4 auditor would charge for a firm with given characteristics and then isolate the difference. Models that tie audit fees to firm characteristics have been extensively developed starting with Simunic (1980). In particular, the models are log-linear in audit fees and firms’ assets. We use the following model from Blankley et al. (2012) that introduces

several additional control variables.¹⁰ A complete description of the variables may be found in Appendix A.

[Insert Appendix A Here]

$$\begin{aligned}
 LAF_{i,t} = & \alpha_0 + \alpha_1 \text{Big-5/4} + \alpha_2 \text{LTA}_{i,t} + \alpha_3 \text{CR}_{i,t} + \alpha_4 \text{CA_TA}_{i,t} + \alpha_5 \text{ARINV}_{i,t} + \alpha_6 \text{ROA}_{i,t} + \alpha_7 \text{Loss}_{i,t} + \alpha_8 \text{Foreign}_{i,t} \\
 & + \alpha_9 \text{Merger}_{i,t} + \alpha_{10} \text{Busy}_{i,t} + \alpha_{11} \text{LEV}_{i,t} + \alpha_{12} \text{Intang}_{i,t} + \alpha_{13} \text{SEG}_{i,t} + \alpha_{14} \text{Opinion}_{i,t} + \alpha_{15} \text{MatWeak}_{i,t(t-1)} \\
 & + \alpha_{16} \text{Industry}_{i,t} + \varepsilon_{i,t}
 \end{aligned} \tag{5}$$

If a firm is audited by Arthur Andersen, Deloitte & Touche, Ernst & Young, KPMG, or PricewaterhouseCoopers (or just the last 4 after AA's collapse), the Big-5/4 Dummy equals 1 and 0 otherwise. The control variables are consistent with prior research (Simunic 1980a; Palmrose 1986; Whisenant, Sankaragurusuvamy, and Raghunandan 2003; Francis, Reichelt, and Wang 2005; Hay, Knechel, and Wong 2006). The audit effort measures are log of total assets (LTA); the presence of mergers (Merger) or foreign operations (Foreign); the number of business segments (SEG); and the auditors issuing a going concern opinion (Opinion). Further, six audit risk measures are: Current ratio (CR); current assets divided by total assets (CA_TA); accounts receivable and inventory (ARINV); return on assets (ROA); incurrence of a loss (Loss), and intangible assets to total assets ratio (Intang). Financial leverage (LEV) captures long-term financial structure of the client. We also include industry dummies following Ashbaugh et al. (2003), since our analysis is based on industry premium. To control for internal control quality, we also use a variable as the company has material weakness (MatWeak) in the current year (Ettredge, Li, and Sun 2006; Doyle,

¹⁰ An alternative to transforming the fee variables by their natural log is to scale the fee variables by total assets (Ashbaugh et al. 2003). We do not use this transformation because our focus is the magnitude of fees instead of the relative cost of audit-related services to the client.

Ge, and McVay 2007). Finally, we include a variable (Busy) if the company’s fiscal year end is December 31st.

We use the residual from Equations (5) to construct our empirical measure of the Big-4 premium charged to the client firm. As the right-side regressors in Equation (5) include both firm characteristics as well as average Big-4 and industry effects, the residual measures firm-specific “abnormal” fees. If this residual is large, it is indicative of the client firm being charged high abnormal fees by the Big-4 (due to unobservable firm specific factors). The use of *changes* in the residual automatically controls for firm and auditor fixed effects, such as the firm or auditor location and audit office quality, which do not change from year to year. For this reason, omitted variables in the audit fee model are of less concern in our analyses. The same point applies to the inclusion of the Big-4 dummy. As it is a constant amount for the entire sample, it will not be part of the difference of residuals. However, the inclusion of this dummy makes our model more comparable with earlier literature.

To the extent that the market equilibrium is being driven by Big-4 pricing strategies, we would expect the firms being charged high excess fees to be the ones that switch to NB-4 auditors. We test this by building on an auditor switching model based on Landsman et al. (2009). The structure of that model, and in particular, their construction of a “mismatch” variable is described in Appendix B.

[Insert Appendix B Here]

$$\begin{aligned}
 \text{Switch}_{i,t} = & \alpha_0 + \alpha_1 \Delta \text{Abafee}_{i,t-1} + \alpha_2 \text{TestVar2} + \alpha_3 \text{Growth}_{i,t-1} + \alpha_4 \text{ABSDACC}_{i,t-1} + \alpha_5 \text{ARINV}_{i,t-1} \\
 & + \alpha_6 \text{Opinion}_{i,t-1} + \alpha_7 \text{Modop}_{i,t-1} + \alpha_8 \text{Tenure}_{i,t-1} + \alpha_9 \text{ROA_L}_{i,t-1} + \alpha_{10} \text{Loss_L}_{i,t-1} \\
 & + \alpha_{11} \text{LEV_L}_{i,t-1} + \alpha_{12} \text{Cash}_{i,t-1} + \alpha_{13} \text{Big4*Mismatch}_{i,t-1} + \alpha_{14} \text{Expert}_{i,t-1} \\
 & + \alpha_{15} \text{Size}_{i,t-1} + \alpha_{16} \text{M\&A}_{i,t-1} + \varepsilon_{i,t}
 \end{aligned} \tag{6}$$

Our theory assumes that firms rationally select the auditor who suits them best in the year before the switch. The mismatch variable from Landsman et al. (2009) control for “noise” in this assumption. Since our sample in the switching regression consists only of Big-4 firms, a high mismatch implies that firms of similar observable characteristics typically chose NB-4 auditors. So, either these firms have a high *unobservable* value for a Big-4 auditor, or have made a suboptimal choice. In our context, the variable is a proxy to control for a possible suboptimal choice in prior years so that their decision to switch is based on neither fees nor a shift in preferences but simply because they finally realized the sub-optimality of their choice.

To control for changes in audit risk, we include Growth, ABSDACC (Stice 1991; DeFond and Subramanyam 1998). We include other variables to control for client-specific aspects of the audit engagement related to audit risk, such as ARINV, Opinion, Modop and Tenure (Dopuch, Holthausen, and Leftwich 1987; Stice 1991; Krishnan 1994; Krishnan and Krishnan 1997; Johnstone and Bedard 2004). To control for financial risk, we include ROA_L, Loss_L, LEV_L, and Cash. Finally, we include Expert, Size and M&A as additional control variables (Hogan and Jeter 1999), because companies are more likely to switch auditors after a merger or acquisition if the two companies involved had different auditors prior to the merger. After controlling for all these factors that have been advanced as influencing switching behavior in prior studies, we focus on the effects of our test variables that measure the effects of fees and market share variables on switching behavior.

Our main test variable is $\Delta Abafee_{i,t-1}$ which measures the change in the residual in Equation (5) from year t-2 to t-1 (see also Equation 6). Our second test variables (TestVar2) are the different instruments that we use to study the relative preference for the Big-4 auditor. In order, these are NB-4 industry market share in 2000 and AA market share in 2000. While we have a prediction

that the coefficient on $\Delta Abafee_{i,t-1}$ will be negative only if the relative preference for the Big-4 auditor has changed, we have no predictions about the sign of coefficients on the other test variables. For example, the NB-4 2000 market share measures the relative competitive position of NB-4 firms prior to 2001. Whether more switching is to be expected in industries where NB-4 auditors were less competitive or in those where they were more competitive (pre-SOX) cannot be predicted without making very specific assumptions about how the enactment of SOX affected the quality of audits on an industry-by-industry basis.

We repeat this procedure on various subsamples both to confirm our hypotheses and to check for robustness. The first and most important subsample test is to split auditor switches into resignations (auditor driven) and dismissals (client driven). Our theory and hypotheses are primarily related to client driven switches and so we expect that the hypotheses should hold in the dismissal sample but not in the resignations sample. As a last and important robustness check, we split the firms into quintiles based on firm size by total assets. While theoretically any client firm can pick either a Big-4 or NB-4 auditor by agreeing to pay an appropriate fee, this may not be true for very large firms where there might be practical difficulties in hiring a NB-4 auditor. So we expect the result to be weakest in the largest size quintile.

III. RESULTS

Before presenting our results, we outline some statistics that form the background for our analyses. After AA's demise, most of their clients switched to other Big-4 auditors. As a consequence, the surviving Big-4 firms all had increases in the number of clients even though the combined market share of the Big-4 in 2007 was less than the combined market share of the Big-5 in 2001 (before the collapse of AA). The total market share of the Big-4 has fluctuated over the

period 2008-2015 but the overall market share in 2015 is similar to that in 2007 (a change of 0.07%).

This suggests that the shock to the equilibrium created by the enactment of SOX and the collapse of Arthur Andersen led to a sweeping restructure in the market for audit services. Of particular interest are the results showing that although the total market shares of the Big-4 in 2007 was lower than that of the Big-5 in 2000, the individual market shares of the remaining Big-4 firms increased over the same period and declined a little subsequently (Table 2, Panel A). This pattern suggests that capacity constraints have played a relatively small role in the long-term restructuring of the audit market. Typically, capacity increases year-by-year and is more restrictive in the early years when capacity is expanding rather than the subsequent period when full capacity has been attained.¹¹ The last point from an overview of the sample is that NB-4 market share increased in every asset-size quintile and was not restricted just to the smallest firms. The only quintile where the increase in NB-4 market share was negligible is, not surprisingly, the largest quintile. All these details are provided in different panels of Table 2.

[Insert Table 2 Here]

Table 3 provides descriptive statistics about the variables and their (Pearson) correlations. Panel A shows the means and standard deviations as well as quartiles of our main variables. One detail of interest is that 25 percent of auditors are in the first year of service across the entire sample period (Table 3 A, Tenure Q1).¹² We discuss next the correlations between the dependent variable

¹¹ Capacity constraints may NOT be limited to Big-4 if SOX increased demand for audit services related to SOX404 audit requirements starting in 2004. There is no reason to believe that NB-4 auditors are able to increase their capacity to meet such demand while Big-4 cannot do so. It is more plausible that by the end of 2015, both Big-4 and NB-4 could have installed more capacity were it more profitable to do so.

¹² This percentage also includes all AA clients who are in their first-year with another Big-4 auditor as well as the firms who switched to an NB-4 auditor who form the sample for our main tests.

(Switch) and the test variables (Δ Abafee, NB-4 Market Share 2000, and AA Market Share 2000). The first two correlations are negative while the third is insignificant (all at the 10% level). The first two results suggest that switches were driven by factors additional to fee increases; that is, both supply-side and demand-side effects played a role in the restructure of the audit market. It is also interesting to note that NB-4 market share 2000 and the AA market share 2000 variables are negatively correlated; that is, the industries where NB-4 had larger market share were also the ones where AA had lower market shares. However, as is shown in Table 5 Panel A, the AA market share in 2000 is not significant in explaining switching behavior in the period 2003-2015 whereas NB-4 market share in 2000 does have a significant influence.

[Insert Table 3 Here]

The main point of our methodology is that the residual term contains any "above the market" premium charged to that client-firm through the Big-4 audit. Following this approach, we use an audit fee model (Equation 5) to identify the residual. The results of this process are given in Table 4. The coefficients on the observable factors are consistent with prior literature and show that our sample has no unusual properties. The fitted fee from this model reflects the amount that the firm might be expected to be charged based on their firm-specific factors. In theory, the firm might expect to save any residual fees by switching to another auditor. In particular, we argue that an increase in the residual is likely to induce the client to switch to an NB-4 auditor.

[Insert Table 4 Here]

The main results for all our hypotheses are presented in the panels of Table 5. Although our main focus for Panel A is on Column I which covers the years 2003-2015, we include the period 2000-2002 (Column II) for comparison purposes. First, we show that the change in audit fee residual from Equation (5) has a significantly negative coefficient in the switch model (Coeff. = -

0.295 and p-value = 0.00). The inference is that firms with larger residual fee increases paid to Big-4 auditors were less, but not more, likely to switch to NB-4 auditors. This is inconsistent with the assumption that audit clients were dropped or driven away from the Big-4 due to large increases in audit fees. If firms realized that they were paying excess fees *after adjusting* for the mean industry and Big-4 premium, they should be more willing to consider a NB-4 auditor. Instead, we find that such firms are less likely to switch auditors. The most likely explanation for this finding is a form of “survivorship bias” -- firms that continue to retain Big-4 auditors perceive some special benefit from this relationship above and beyond that implied by their observable characteristics and are willing to pay higher idiosyncratic fees whereas those that see reduced benefit from a Big-4 audit switch away even though they were being charged lower fees relative to their observed characteristics.

Column I in Table 5, Panel A also shows that industries in which the NB-4 had lower market share in 2000 (NB-4 Market Share 2000) also had a higher probability of switching in the period 2003-2015 (coefficient = -2.007 and p-value = 0.04). The inference from this finding is that industries where NB-4 audits were less valued prior to 2000 narrowed the quality gap between them and Big-4 auditors more after 2002. As noted earlier, it is difficult to make a specific prediction without making assumptions about how SOX (and other regulatory changes) affected the relative quality across the Big-4 and NB-4 on an industry-by-industry basis. Our results suggest that the regulatory changes improved the ability of the NB-4 to compete more effectively in industries where they were less competitive in 2000. To sum up, the overall findings in Table 5 Panel A, Columns Ia, Ib, and IIa IIb are that switching behavior seems to be influenced by demand-side factors such as a greater attractiveness for Big-4 audits for some firms (who are willing to pay

high excess premia) or a greater preference for NB-4 audits for other firms in industries where the NB-4 were less competitive pre-2000.¹³

We note that all the results in the switching model are derived after controlling for the mismatch variable (Landsman et al. 2009). This variable is determined based on the optimal cut-off score based on observable firm characteristics that creates the least misclassification of auditor selection (see Appendix B for more details). Then firms below the cutoff that choose Big-4 or firms that are above the cutoff but choose NB-4 are classified as mismatched firms. In terms of our methodology, this variable controls for noise in our assumption that the choice of a Big-4 auditor in the year before the switch was an optimal decision. As in Landsman et al. (2009), we find that mismatched firms are more likely to switch but the negative effect of the residual fee on switching holds even after controlling for mismatched firms (the variable is termed Mismatch instead of Big4*Mismatch in order to highlight the fact that our entire sample only consists of Big-4 firms).

Auditor dismissals are more likely to reflect demand-side effects of client-firm preferences whereas auditor resignations are more related to supply-side effects such as the auditor's choice of less risky clients or due to capacity constraints. In order to test this argument, we separate auditor switches into three categories, dismissals, resignations, and unclassified. The results are shown in Table 5 Panel B. We find that the relationship between change in audit fee premium and auditor switch is significantly negative in the dismissal sample (Coeff. = -0.315, p-value = 0.00). In

¹³ We test for potential multicollinearity problems by examining the Variable Inflation (VIF) statistic. The VIF for equation (2) is 1.37 and 3.24 in equation (3) so multicollinearity is not a concern. We used several different statistics (such as the Ramsey RESET test) to test the robustness of our results to potential omitted variables. The Breusch-Pagan and White test for heteroscedasticity were positive. However, using heteroscedasticity-robust standard errors did not change the ranking of the Industries based on the Big-4 incremental premium. We did not find any significant changes in the ranking of the industries by Big-4 pricing power although there are some occasions when industries changed places with the ones immediately above or below. These changes had some effect on the Spearman ranking correlation score but the effects were small and did not suggest any changes in the conclusion of a negative association between industry-premium increases and market share changes.

contrast, we find a significantly positive relationship between the change in audit fee premium and audit switch in auditor resignation sample (Coeff. = 0.274, p-value = 0.00). This finding suggests that the auditors resign from engagements because of increased risk that outweighs the ability to increase fees. To support this interpretation, we note that the resignation subsample contains more loss firms, more firms with modified opinions and firms with larger discretionary accruals. The NB-4 Market Share in 2000 is negative in the dismissal group, and positive but not significant in the resignation group. This may be due to loss of power as the sample size where the auditor change is marked as dismissal, resignation, and unclassified, respectively, is only $1543 + 292 + 519 = 2,354$ as opposed to the full sample of switches that constitutes 23,521.

Taken together, these results support a finding that demand-side (dismissal) effects have been significant in the change of market share from the Big-4 to NB-4 whereas resignations take place for reasons that are different from those that drive dismissals. In addition, the Mismatch is significantly negative for both the resignation and the dismissal subsamples. This result implies that firms which are mismatched as measured in Landsman et al. (2009) are less likely to switch after controlling for changes in the residual fee. The likely inference is that the decision to choose and retain a Big-4 auditor by these mismatched firms is due to idiosyncratic unobservable benefits associated with Big-4 audits rather than fee considerations. The same explanation may hold for the resignation subsample as well, though the unclassified sample has a positive coefficient.

We also explore the relationship between the AA market share in 2000 and the propensity to switch in the period 2003-2015. To the extent that the AA market share reflects a preference for a Big-4 auditor and these preferences shifted post-2002, we would expect this variable to have some association with the propensity to switch. However, the association is insignificant (Table 5 Panel A). One reason might be that the preferences of clients changed in both directions with

regard to the value of a Big-4 audit. As a result, we do not have a clear relationship between AA's market share in 2000 and the switching subsequent to 2002. Given the failure of the test based on AA's market share, we then analyze the switching behavior at the client level by separating the year-2000 sample into prior-AA clients and others. The results are given in Panel C of Table 5. Here, the negative association between premium changes and switching to NB-4 is significant (coefficient = -0.347, p-value = 0.00) only for non-AA clients whereas the prior-AA clients show a significantly positive association (coefficient = 0.728, p-value = 0.00) between premium increases and switching probability. This finding may be driven by the fact that prior-AA clients who were disillusioned with a Big-4 auditor had switched to NB-4 before our test period and the switching in 2003-2015 was driven primarily by fee considerations.

As might be expected, market share increases of NB-4 firms are monotonic in asset-size quintiles (see Table 2 Panel C). Consequently, we looked at the auditor switching by firm size on an asset quintile-by-quintile basis (Table 5 Panel D). We focus on the four lower quintiles as largest firms (AT5) may not have the option of choosing a NB-4 auditor (though we note that our results are significant in this quintile). As may be expected, we find that the association between switching and the key variable of abnormal fee changes is significantly negative in quintiles AT2, AT3, and AT4 whereas it is positive in the lowest quintile (AT1). Our interpretation is that the perceptions of the value of a Big-4 audit did not change much for the lowest quintile (leading to a weak positive association with premium changes) whereas they did affect larger firms where the switches are negatively associated with higher fees. In addition, the level of market share held by NB-4 auditors prior to 2000 has a significantly negative influence on switching in two of the four lowest quintiles and is insignificant in the other quintiles.

As with our main results, we also analyze the difference between the auditor dismissal and resignation samples (Table 5 Panel E). We find again that the negative association between abnormal premium changes and switching only holds in the dismissal sample but not the resignation sample. The coefficient for NB-4 market share is less stable in these regressions partially due to the fact that the left-hand side dummy variable is predominantly zeroes.¹⁴ In so far as a pattern can be discerned, when this coefficient is significant, it is more likely to be negative rather than positive. Combining the findings on the explanatory variable of (i) abnormal fees and (ii) 2000 NB-4 market share, analysis of the switching model by size-quintiles confirms the influence of broad demand-side shifts in the audit market over the years 2003-2015.

[Insert Table 5 Here]

As an alternative to including it as a control, we used the Mismatch variable (Landsman et. al. 2009; see Appendix B) to construct a matched sample of 530 switching firms with 524 non-switching firms (match within .00012 of score). The motivation is that both the test firms and control firms should have the same ex ante likelihood of switching in the next year. The results in Table 6 show that switching firms had a significantly greater premium *decrease* in the prior year than non-switching firms. In addition, as shown in Panel B, the abnormal audit fee itself was negative, that is, the combined sample of both treatment and control firms in this test paid below average fees. Even among these firms, the ones that switched did so even though they were paying a lower abnormal fee relative to the non-switching firms. In other words, even though the Big-4 auditor was charging the switching firms a lower fee relative to the control firms, they nevertheless switched to an NB-4 auditor.

¹⁴ The regression was run three times on the entire sample with resignations, dismissals, and unclassified coded respectively as 1 and other observations coded as 0. As the set of observations that were classified in one of these three groups is much smaller than the total sample, most observations were coded as 0 in all three regressions.

[Insert Table 6 Here]

SENSITIVITY TESTS

To support our results, we conduct a number of sensitivity tests. All these tests are aimed at verifying if the main result documented in our paper that there is a negative association between fee premium changes and the propensity to switch from a Big-4 auditor which is consistent with shifts in client preferences and is inconsistent with an assumption that the market share restructuring resulted from the facts that audit costs rose consequent to regulatory changes. The two main issues that we check are the effects of capacity constraints (supply-side effect) and additional regulatory changes that may have provided confounding effects. The unexpected collapse of AA led to a sudden shift in demand to the surviving Big-4 auditors. As documented in Table 2 Panel B, the surviving Big-4 grew slightly in 2000-2003 in a few industries but the market share decreased in all industries subsequently and this trend lasts till 2015.

The period covered by our study also saw other changes in regulations both on the market side and on the accounting side. Some of these other events may also have played a part in changing the Big-4 premium. Specific examples are the requirement of fair value disclosures (Fin 48) or Auditing Standard 5 (Krishnan, Krishnan, and Song 2011). Such disclosures inevitably involve estimates that may increase audit failure costs, imposing greater risk on the Big-4. While we acknowledge this possibility, it does not affect our basic analysis of whether premium increases have resulted in market share shifts or whether demand-side changes also played a major role. However, to get a better understanding of these shifts, we consider several tests documented in the panels of Table 7.

Busy Season

To further study possible effects of capacity limitations, we examine the “busy season” firms; that is, those with fiscal year ending on December 31st separately from those having a different fiscal year end. The results presented in Table 7 Panel A show that the negative association between premium changes and the likelihood of a switch is only present in the December 31st FY end sample. However, when the two groups are further separated into auditor dismissals and resignations (Table 7 Panel B), the dismissal group exhibits the negative association, regardless of month of fiscal year end. To the extent that capacity constraints are likely to be strongest in the December FY-end resignation sample, the results in Table 7 Panel B are consistent with our earlier findings and arguments that this negative association is driven by demand-side changes and should be found primarily in the dismissal sample. We also note that the abnormal fee is significantly positive in the busy season resignation sample. Although our theory is primarily concerned with client-side choices, this positive relationship may be a reflection of suggestions in the earlier literature that Big-4 auditors are resigning from risky clients who are already paying a risk-premium within their audit fees.

Accelerated Filers

As some smaller firms were given a longer period to deal with the requirements of SOX Section 404 (or not to comply with them) we separate these non-accelerated filers from the main sample. The negative association between premium increases and switching probability is only found in the sample of accelerated filers (Table 7 Panel C). This finding is plausible in that non-accelerated filers were not affected as strongly by the new regulations and should therefore have faced relatively low fee increases and little change in their demand for audit services.

Different Time Periods

In addition to checking the capacity constraints, we also tested our model over different time periods. In Table 7 Panel D, we document results for the time periods 2003-2010, 2003-2011, 2003-2012, 2003-2013, 2003-2014, with regard to the effect of abnormal fees on switching. In each of the sub-periods, the coefficient on the abnormal fee is negative and significant. The coefficient on NB-4 2000-market share is less stable but is negative in all years. It is highly significant in the periods 2003-2010, 2003-2011 2003-2014 but not significant in the sub-periods 2003-2013 and 2003-2014. We interpret this as consistent with the theory that this proxy for NB-4 market power in 2000 is likely to become less significant as the market structure adapts to a new equilibrium.

In summary, while there is a legitimate argument that other events besides the enactment of SOX and the collapse of AA may have added to the effect in the Big-4 premium, these effects do not affect the main empirical findings of our analysis that market share shifts have been affected by changes in the perceived value of NB-4 audits as well as Big-4 pricing strategies.

[Insert Table 7 Here]

IV. CONCLUSION

The market for auditing services is highly concentrated with Big-5/4 audit firms. In 2002, one of these auditors, Arthur Andersen, went out of business. In addition, a comprehensive set of new regulations concerning auditing (SOX) went into effect. Subsequently, in the period 2003-2015, there were significant increases in audit fees charged by both Big-4 and NB-4 auditors as well as significant decreases in market share for Big-4.

We rely on economic arguments to develop hypotheses on how these two events would have affected the choice of Big-4 auditors, and thereby, the market shares of Big-4 auditors. Denoting

the difference in fees as a Big-4 fee premium and the difference in benefits as a Big-4 quality premium, a firm that is with the Big-4 would switch to an NB-4 auditor if the increase in the fee premium outweighed the increase in the quality premium. In particular, if the quality premium stayed constant, firms that faced the highest increase in fee premium would be more likely to switch. We show this is *not* consistent with our empirical findings, leading to an inference that the quality premium also shifted over this period.

In support of this conclusion, we show that the negative association between switching probability and increase in the Big-4 premium holds only in the sample where the client firms dismissed the auditor but not in the sample where the auditor resigned. This result shows that our theory which views the decision to switch purely from the clients' perspective is not likely to apply to auditor resignations, which may have been driven by factors other than fees or the value of the audit to the client-firm. We also support our findings by testing different client asset quintiles. In particular, we show that our overall finding of a negative correlation between the premium change with the propensity to switch holds in the higher asset quintiles, and, in particular, in asset quintiles 2 and 3 where Big-4 and NB-4 auditors may be expected to be most competitive.

We further support our argument of a change in the differential benefits across Big-4 and NB-4 auditors by showing the influence of 2000 NB-4 market share on post-2003 switching behavior. Specifically, we show that there has been more switching in industries where the NB-4 was weakest in 2000. We argue that these were the industries where a Big-4 audit was valued more relative to a non-Big-4 audit and that the difference in values has reduced more in these industries post-2003.

While the collapse of AA and enactment of SOX are major economic events, there have been many other changes in the audit environment over the period 2003-2015 as well as a major

recession. We do not examine these features individually but do show that our results are stable across different time windows within this period. More specifically, if the effect of any of these shocks on the fee and quality premia can be clearly identified, it would be possible to test for their separate effects on auditor choice. In addition, SOX changed many other aspects of corporate structure including governance. Although we control for many firm-specific features connected to audit fees, we do not study the role of governance or management incentives on the decision to retain a Big-4 auditor or not. Managers (and/or the board) may see value in hiring a Big-4 auditor even if the extra premium is not recovered through the equity market. One of the challenges for the future is to examine whether agency conflicts may lead to the retention of Big-4 auditors even if such retention does not directly benefit shareholders.

REFERENCES

- Amemiya, T. 1981. Qualitative response Models: A Survey. *Journal of Economic Literature* 19 (4): 1483-1536.
- Amemiya, T. 1985. *Advanced econometrics*. Harvard university press.
- Ashbaugh, H., R. LaFond, and B.W. Mayhew. 2003. Do nonaudit services compromise auditor independence? Further Evidence. *The Accounting Review* 78 (3): 611-639.
- Asthana, S., S. Balsam, and S. Kim. 2009. The effect of Enron, Andersen, and Sarbanes-Oxley on the market for audit services. *Accounting Research Journal* 22 (1): 4-26.
- Bar-Yosef, S., and B. Sarath. 2005. Auditor size, market segmentation and litigation patterns: a theoretical analysis. *Review of Accounting Studies* 10 (1): 59-92.
- Beatty, R. P. 1989. Auditor reputation and the pricing of initial public offerings. *The Accounting Review* 64 (4): 693-709.
- Blankley, A., S. Hurtt, and J. MacGregor. 2012. Abnormal audit fees and restatements. *Auditing: A Journal of Practice & Theory* 31 (1): 79-96.
- Blokdijs, H., F. Driehuisen, D. A. Simunic, and M. T. Stein. 2006. An analysis of cross-sectional differences in big and non-big public accounting firms' audit programs. *Auditing: A Journal of Practice and Theory* 25 (1): 27-48.
- Blouin, J., B. Grein, and B. R. Rountree. 2007. An analysis of forced auditor change: The case of former Arthur Andersen clients. *The Accounting Review* 82 (3): 621-650.
- Cassell, C. A., G. Giroux, L. A. Myers, and T. C. Omer. 2013. The emergence of second-tier auditors in the US: Evidence from investor perceptions of financial reporting credibility. *Journal of Business Finance & Accounting* 40 (3-4): 350-372.
- Causholli, M., and W. Robert Knechel. 2012. An examination of the credence attributes of an audit. *Accounting Horizons* 26 (4): 631-656.
- Choi, J., R.K. Doogar, and A.R. Ganguly. 2004b. The riskiness of large audit firm client portfolios and changes in audit liability regimes: Evidence from the U.S. audit market. *Contemporary Accounting Research* 21(4): 747-785.
- Chu, L, D. A. Simunic, M. Ye, and P. Zhang 2018. Transaction Cost and Competition among auditors in local markets, *Journal of Accounting and Economics* 65 (1): 129-147.
- Danos, P., and J. W. Eichenseher. 1986. Long-term trends toward seller concentration in the U.S. audit market. *The Accounting Review* 61 (4): 633-650.
- Datar, S. and Alles, M. 1999. The Formation and Role of Reputation and Litigation in the Auditor–Manager Relationship. *Journal of Accounting, Auditing & Finance*, 14 (4): 401-428.
- DeFond, M.L., and K.R. Subramanyam. 1998. Auditor changes and discretionary accruals. *Journal of Accounting and Economics* 25 (1): 35-67.
- Domencich, T. A. and D. L. McFadden. 1975. *Urban Travel Demand*. Amsterdam: North-Holland.
- Dopuch, N., and D. Simunic. 1980. The nature of competition in the accounting profession: A descriptive and normative view. In *Regulation and the Accounting Profession*, edited by

- J.W. Buckley, and J.F. Weston, 77-94. Regulation and the Accounting Profession, Belmont, CA, Lifetime Learning Publication.
- Dopuch, N., R. W. Holthausen, and R. W. Leftwich. 1987. Predicting audit qualifications with financial and market variables. *The Accounting Review* 62 (3): 431-454.
- Doyle, B., W. Ge, and S. McVay. 2007. Determinants of weakness in internal control over financial reporting. *Journal of Accounting and Economics* 44 (1-2): 192-223.
- Dye, R. A. 1993. Auditing standards, legal Liability, and auditor wealth. *Journal of Political Economy* 101 (5): 887-914.
- Ettredge, M., C. Li, and L. Sun. 2006. The impact of SOX Section 404 internal control quality assessment on audit delay in the SOX era. *Auditing: A Journal of Practice & Theory* 25 (3): 1-23.
- Francis, J. R. 1984. The effect of audit firm size on audit prices: A study of the Australian market. *Journal of Accounting and Economics* 6 (2): 133-151.
- Francis, J. R., K. Reichelt, and D. Wang. 2005. The pricing of national and city-specific reputations for industry expertise in the U.S. audit market. *The Accounting Review* 80 (1): 113-136.
- Ferguson, C. M. Pinnuck and D. J. Skinner, 2014. The Evolution of Audit Market Structure and the Emergence of the Big 4: Evidence from Australia, SSRN, Chicago Booth Research Paper No. 14-13
- General Accounting Office (GAO). 2006. *Sarbanes-Oxley Act: Consideration of Key Principles Needed in Addressing Implementation for Smaller Public Companies*. Washington, D.C.: United States General Accounting Office.
- Ghosh, A., and R. Pawlewicz. 2009. The impact of regulation on audit fees: Evidence from the Sarbanes-Oxley Act. *Auditing: A Journal of Practice & Theory* 28 (2): 171-197.
- Griffin, P. A., and D. H. Lont. 2007. An analysis of audit fees following the passage of Sarbanes-Oxley. *Asia-Pacific Journal of Accounting & Economics* 14 (2): 161-192.
- Gu, T., D. A. Simunic, and M. T. Stein. 2019. *Audit Production with Joint Fixed Costs: Theory and Evidence*. Working paper, University of Hong Kong, University of British Columbia, and Old Dominion University.
- Hay, D., W. R. Knechel, and N. Wong. 2006. Audit fees: A meta-analysis of the effect of supply and demand attributes. *Contemporary Accounting Research* 23 (1): 141-191.
- Hay, D., W. R. Knechel. 2016. Meta-regression in auditing research: Evaluating the evidence on the Big N audit firm premium. *Auditing: A Journal of Practice & Theory*. Forthcoming.
- Hogan, C.E., and D. C. Jeter. 1999. Industry specialization by auditors. *Auditing: A Journal of Practice & Theory* 18 (1): 1-17.
- Johnstone, K. M., and J. C. Bedard. 2004. Audit firm portfolio management decisions. *The Accounting Review* 42 (4): 659-690.
- Khurana, I. K., and K. K. Raman. 2004. Litigation risk and financial reporting credibility of Big-4 versus Non-Big4 audits: Evidence from Anglo-American countries. *The Accounting Review* 79 (2): 473-495.

- Krishnamurthy, S., J. Zhou, and N. Zhou. 2006. Auditor reputation, auditor independence, and the stock market impact of Andersen's indictment on its client firms. *Contemporary Accounting Research* 23 (2): 465-490.
- Krishnan, J. 1994. Auditor Switching and Conservatism. *The Accounting Review* 69 (1): 200-215.
- Krishnan, J. and J. Krishnan. 1997. Litigation risk and auditor resignations. *The Accounting Review* 72 (4): 539-560.
- Krishnan, J., J. Krishnan, and H. Song. 2011. The Effect of Auditing Standard No. 5 on Audit Fees. *Auditing: A Journal of Practice & Theory* 30 (4): 1-27.
- Landsman, W. R., K. K. Nelson, and B. R. Rountree. 2009. Auditor switches in the pre- and post-Enron eras: Risk or realignment? *The Accounting Review* 84 (2): 531-558.
- Maher, M. W., P. Tiessen, R. Colson, and A. J. Broman. 1992. Competition and Audit fees. *The Accounting Review* 67 (1): 199-211.
- Mansi, S. A., W. F. Maxwell, and D. P. Miller. 2004. Does auditor quality and tenure matter to investors? Evidence from the bond market. *Journal of Accounting Research* 42 (4): 755-793.
- McFadden, D. 1973. *Conditional Logit Analysis of Qualitative Choice Be*. In: Zarembka, P., Ed., *Frontiers in Econometrics*, Academic Press, New York, 105-142.
- Menon, K., and D. D. Williams. 1991. Auditor credibility and initial public offerings. *The Accounting Review* 66 (2): 313-332.
- O'Keefe, T. B., D. A. Simunic, and M. T. Stein 1994. The Production of Audit Services: Evidence from a major public accounting firm. *Journal of Accounting Research* 32 (2): 241-261.
- Palmrose, Z-V. 1986. Audit fees and auditor size: Further evidence. *Journal of Accounting Research* 24 (1): 97-100.
- Pittman, J. A., and S. Fortin. 2004. Auditor choice and the cost of debt capital for newly public firms. *Journal of Accounting and Economics* 37 (1): 113-136.
- Sarath, B. 2016. Audit quality within adverse selection markets, *Asian Review of Accounting* 24 (1): 2-18.
- Simunic, D. A. 1980. The Pricing of Audit Services: Theory and Evidence. *Journal of Accounting Research* 18 (1): 161-190.
- Shu, S. Z. 2000. Auditor resignations: Clientele effects and legal liability. *Journal of Accounting and Economics* 29 (2): 173-205.
- Stice, J. D. 1991. Using financial and market information to identify pre-engagement factors associated with lawsuits against public accountants. *The Accounting Review* 66 (3): 516-533.
- Teoh, S. H., and T. J. Wong. 1993. Perceived auditor quality and the earnings response coefficient. *The Accounting Review* 68 (2): 346-366.
- Vives, X. 1999. *Oligopoly Pricing: Old Ideas and New Tools*. MIT Press, Cambridge, MA.

Whisenant, S., S. Sankaragurusuvamy, and K. Raghunandan. 2003. Evidence on the joint determination of audit and nonaudit fees. *Journal of Accounting Research* 41 (4): 721-744.

APPENDIX A: DEFINITION OF VARIABLES

Switch	1 if a company switch from a Big-5/4 auditor to a NB-5/4 auditor, 0 otherwise.
ΔAbafee	change in the audit fee premium using the audit fee model by Blankley et al. (2012) from the last year.
NB-4 Market Share 2000	the number of firms audited by NB-4 auditors divided by the whole number of firms in each industry in 2000.
AA Market Share 2000	the number of firms audited by Arthur Andersen divided by the whole number of firms in each industry in 2000.
Dismissal	1 if the departed auditor was dismissed from the engagement by the registrant, 0 otherwise.
Recognition	1 if the departed auditor resigned from the engagement by the registrant, 0 otherwise.
Unclassified Switch	1 if the departed auditor was neither dismissed nor resigned from the engagement by the registrant, 0 otherwise.
Growth	total assets (Data 6) less beginning total assets, divided by beginning total assets.
ABSDACC	absolute value of discretionary total accruals.
Modop	1 if the audit opinion is modified for anything other than a going concern, and 0 otherwise.
Tenure	number of years audited by the incumbent auditor, with a maximum of 10 years.
ROA_L	return on assets, defined as net income before extraordinary items (Data 18) divided by average total assets, with one-year lag (Data 6) (Landsman, Nelson, and Rountree 2009).
Loss_L	1 if ROA_L<0, and 0 otherwise (Landsman, Nelson, and Rountree 2009).
LEV_L	total debt (Data9+Data34) divided by total assets, with one-year lag (Data6) (Landsman, Nelson, and Rountree 2009).
Cash	cash (Data1) divided by total assets (Data6).
Mismatch	1 if the company is mismatched with the incumbent auditor, following the methodology in Shu (2000), and 0 otherwise.
Size	natural logarithm of market value of equity (Data 25 * Data 199).
M&A	1 if the client had a merger and acquisition (footnote code 1) in the two most recent years, and 0 otherwise.
BigN	1 if the company had a Big N auditor, and 0 otherwise.
Size_S	natural logarithm of total assets (Data 6) (Shu 2000).
Acquisition	acquisition expenditure (Data 129) deflated by average assets over the year.
ExFinance	total debt (Data 111) and stock issuances (Data 108) per the cash flow statement scaled by average total assets.
Profitability	income before extraordinary items (Data 18) scaled by average total assets.
MktBk	market value of equity (Data 25 * Data 199) scaled by book value of common equity (Data 60).
LAF	logarithm of audit fees.
Big-5/4	if the firm is audited by KPMG LLP, Deloitte & Touche LLP, PriceWaterhouseCoopers LLP, Ernst & Young LLP, Arthur Andersen LLP.
LTA	logarithm of end of year total assets (Data6).
CR	current assets (Data4) divided by current liabilities (Data5).
CA_TA	current assets (Data4) divided by total assets.
ARINV	sum of accounts receivable (Data2) and inventory (Data 3) divided by total assets.
ROA	earnings before interest and taxes (Data178) divide by total assets.

Loss	1 if firm incurred a loss (Data 172), 0 otherwise.
Foreign	1 if firm has any foreign operations (Data 64), 0 otherwise.
Merger	1 if the firm reported the impact of a merger or acquisition on net income (Data360), 0 otherwise.
Busy	1 if a company's fiscal year is December 31st, 0 otherwise.
LEV	long-term debt (Data9) divided by total assets (Blankley, Hurtt, and MacGregor 2012).
Intang	ratio of intangible assets to total assets.
SEG	logarithm of number of business segments.
Opinion	1 if the auditor issues a going concern audit opinion, 0 otherwise.
Matweak	1 if the client receives a material weakness opinion in the current year or the next year, 0 otherwise.
Industry	industry fixed effects; industry membership follows Ashbaugh et al. (2003) and is determined by SIC code as follows: agriculture (0100-0999), mining and construction (1000-1999), excluding 1300-1399), food (2000-2111), textiles and printing/publishing (2200-2799), chemicals (2800-2824; 2840-2899), pharmaceuticals (2830-2836), extractive (1300-1399; 2900-2999), durable manufactures (3000-3999, excluding 3570-3579 and 3670-3679), transportation (4000-4899), retail (5000-5999), services (7000-8999, excluding 7370-73790, computers (3570-3579; 3670-3679; 7370-7379), and utilities (4900-4999).
NB-4 Effect	
NB-4 Market share	based on the percentage of firms employing NB-5 in 2000.
AA Market Share	based on the percentage of firms employing AA in 2000.
COD	the ratio of a client firm's interest expense to the average short- and long-term debt during the year

APPENDIX B ESTIMATION OF CLIENT MISALIGNMENT

We follow the methodology in Shu (2000) to estimate the probability a firm is misaligned with its current auditor. Specifically, we estimate the following model separately for each year in the sample period, using all available observations from Compustat:

$$\begin{aligned}
 \text{BigN}_t = & \alpha + \alpha_1 \text{Size}_t + \alpha_2 \text{Acquisition}_t + \alpha_3 \text{ExFinance}_t + \alpha_4 \text{Profitability}_t \\
 & + \alpha_5 \text{MktBk} + \varepsilon_t
 \end{aligned}
 \tag{A1}$$

Where $\text{BigN}=1$ if the company had a Big N auditor, and 0 otherwise¹⁵;

TABLE A1
Estimation of Client Misalignment

Panel A: Coefficient Estimate Summary Statistics from Annual Estimations of the Client Misalignment Model

Variable	Coeff.	z-stat.	P-value
Intercept	-6.40	-119.45	0.00
Size	0.36	127.99	0.00
Acquisition	0.45	5.54	0.00
ExFinance	0.04	3.31	0.00
Profitability	0.00	0.03	0.98
MktBk	0.00	7.85	0.00

Panel B: Estimated Cut-Off Probabilities

Year	N	Estimated Cut-Off Probability
2000	3296	0.84
2001	4528	0.84
2002	5294	0.76
2003	5512	0.73
2004	6052	0.57
2005	5929	0.61
2006	5807	0.56
2007	5614	0.56
2008	5305	0.57
2009	4991	0.55
2010	4909	0.58
2011	4908	0.73
2012	4845	0.61
2013	5038	0.61
2014	5214	0.63
2015	4996	0.68

The coefficient estimates from this regression are utilized to estimate the probability of having a Big N auditor in a certain year. The point at which the Big N and non-Big N auditor distributions cross is an estimate of the optimal cut-off level. If the probability of having a Big N auditor falls below the cut-off

¹⁵ Shu (2000) defines the dependent variable to include all “large” auditors, defined as Big N auditors and any auditor identified by an individual auditor code on Compustat, because our analysis is to find the probability that if the client is misaligned with a Big N auditor. Therefore, we follow Landsman et.al (2009), and utilize the Big N auditor as the dependent variable.

point, the client is expected to have a Non-Big N auditor. So if the client has a Big N auditor, then we define MISMATCH equals to 1. We choose different cut-off levels until we get the best cut-off level which will minimize the MISMATCH. Our results are similar to Shu (2000) and Landsman et al. (2009) in their sample period.

TABLE B1 SUPPLY AND DEMAND FUNCTION

Panel A: Reasons for Demand Curve Shifts

Trends of Demand for Big-4 Auditors	Reasons	Market Share & Premium for Big-4
Down	Tarnished reputation as a result of AA collapse & scandals	Drop
Down	Work of regulators & others to increase NB-4 reputation	
Down	Overall fees going up with addition of 404 requirement	
Up	“Tried and true” in face of new regulatory requirements	Increase

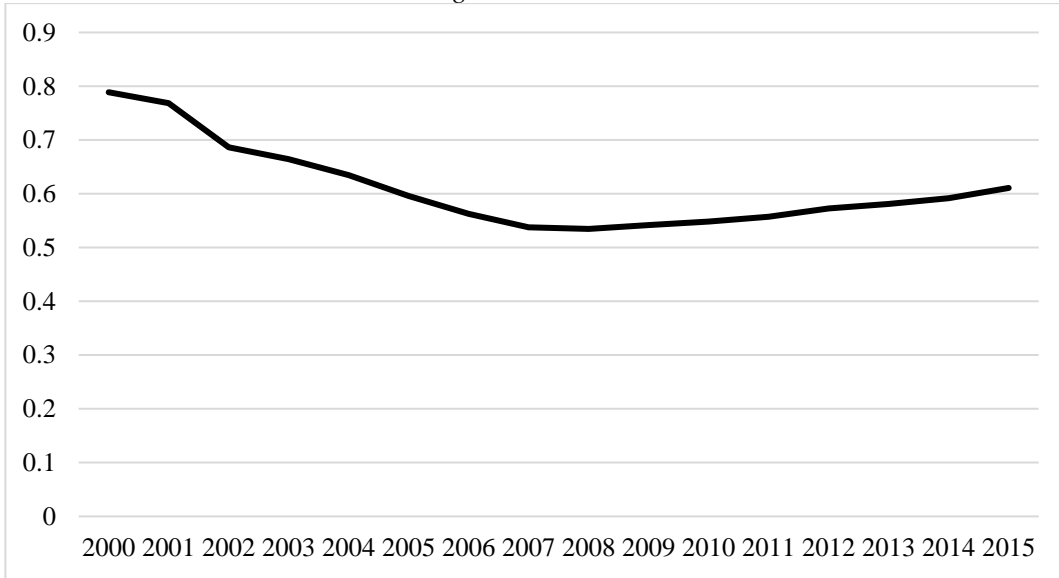
Panel B: Reasons for Supply Curve Shifting up

Trends of Supply for Big-4 Auditors	Reasons	Market Share & Premium for Big-4
Up	Capacity constraints (Excess demand shifts pricing curve up)	Market Share drops, but less clear what happens with fees and premiums
Up	Fewer Big auditors more Oligopoly power	
Up	Cost of risky audits have gone up—charge higher risk-premium for clients	

Figure 1

Trends in Big-5/4 Market Share Ratio and Fee Ratio

Panel A: Big-5/4 Market Share Ratio



Panel B: Market Share Change in Asset Deciles

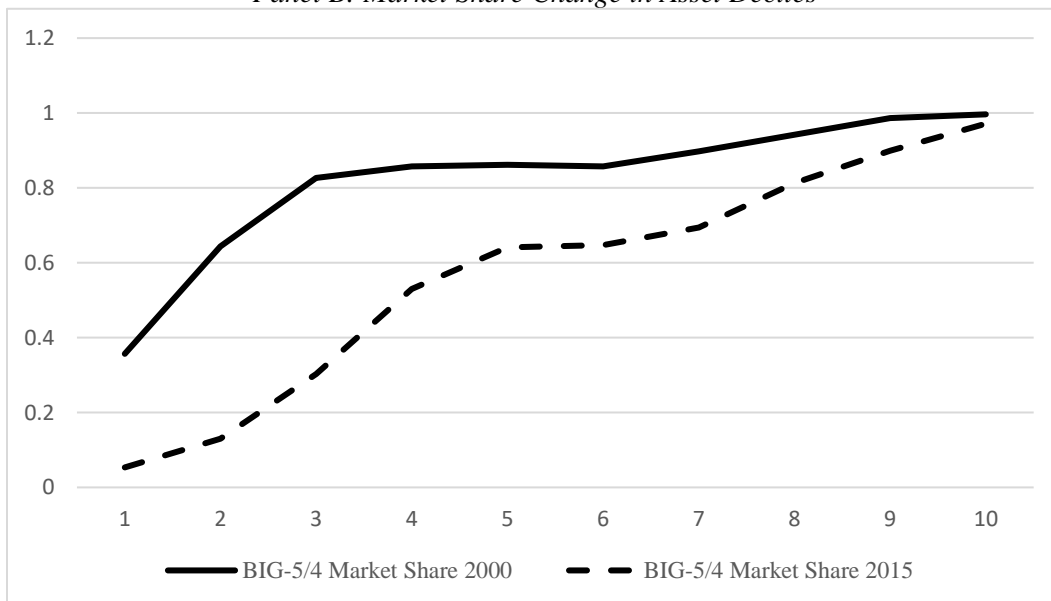
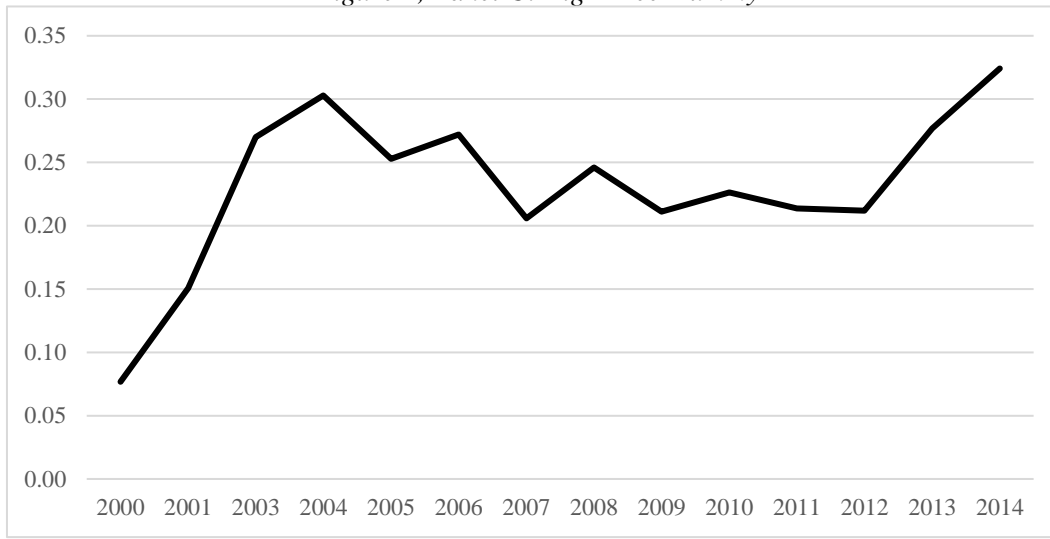


Figure 1, Panel C: Big-4 Fee Dummy



Panel A plots the Big-5/4 Market Share Ratio from 2000-2015 (firms audited by Big-5/4 divided by the total number of firms in the audit market). Panel B plots Big-5/4 Market Share Ratio in 2000 and 2015 by asset size deciles numbered 1(smallest) to 10 (largest). Panel C plots the coefficient value of the Big-5/4 dummy variable in the audit fee regression over the period 2000-2014. This coefficient has been termed as the “Big-4 premium” in prior research.

Table 1
Sample Composition and Attrition

	Audit Fee Model	Switch Model
Firms year observations from Audit Analytics	197,852	
Less: One firm one year has more than one audit fee observation in a fiscal year	8,283	
No financial data	114,377	
No business segment	661	
Financial Industries have been deleted	0	
Final firm year observations	74,531	
Firm year observations before 2003	11,801	
Firm year observations after 2002	62,730	
Missing Compustat data		22,676
Final firm year observations		51,855
Firms not audited by a Big-5/4 auditor in 2002		20,415
After firms switch to a NB-4 auditor, they drop out of the sample		1,564
Final Sample		29,876
Firm year observations before 2003		6,355
Firm year observations after 2002		23,521

We start with 197,852 firm year observations collected from Audit Analytics covering the period 2000-2015. Then we deleted 114,377 observations since financial data was not available on COMPUSTAT and 661 observations were deleted because business segment data was missing. Then 0 observations which belong to financial institutions were deleted. Our final sample consists 74,531 firm year observations. 22,676 of these observations have been deleted for missing value on COMPUSTAT in the audit switching model. We deleted 20,415 observations which were not audited by Big-5/4 auditors in 2002. We focus on the sample which the firms switch maximal once, so after the firms switch from Big-5/4 auditors to an NB-5/4 auditors, they drop out of the sample. In the process, 1,564 observations have been dropped out of the sample. Our final sample for the audit switching model consists of 29,876 observations. 6,355 firm year observations are before 2003 and 23,521 observations are after 2002.

Table 2**Long Time Trends in Audit Market by Industries**

Panel A: Specific Industry Number of Firm Shares for Big-5/4 (2000-2015, the number means fraction of market share)

	Agriculture	MinCon	Food	Textile	Chemicals	Pharma	Extractive	Durable	Trans	Utilities	Retail	Services	Computer	Total
2000	0.89	0.80	0.82	0.85	0.88	0.88	0.90	0.85	0.91	0.94	0.82	0.87	0.88	0.79
2001	0.84	0.84	0.80	0.83	0.80	0.85	0.80	0.83	0.87	0.93	0.82	0.82	0.87	0.77
2002	0.74	0.75	0.75	0.82	0.75	0.77	0.71	0.75	0.85	0.90	0.78	0.73	0.79	0.69
2003	0.77	0.68	0.72	0.80	0.72	0.71	0.62	0.71	0.82	0.89	0.78	0.69	0.74	0.66
2004	0.65	0.63	0.69	0.78	0.69	0.69	0.57	0.67	0.81	0.87	0.75	0.67	0.69	0.63
2005	0.65	0.60	0.68	0.78	0.65	0.64	0.54	0.63	0.79	0.86	0.71	0.62	0.63	0.60
2006	0.64	0.60	0.68	0.77	0.62	0.61	0.52	0.60	0.76	0.83	0.69	0.62	0.61	0.56
2007	0.52	0.61	0.65	0.73	0.59	0.60	0.52	0.56	0.74	0.82	0.67	0.60	0.60	0.54
2008	0.44	0.59	0.63	0.74	0.58	0.59	0.55	0.55	0.77	0.81	0.68	0.62	0.62	0.53
2009	0.41	0.54	0.62	0.74	0.60	0.56	0.59	0.56	0.78	0.82	0.70	0.61	0.64	0.54
2010	0.42	0.51	0.61	0.75	0.63	0.54	0.57	0.57	0.78	0.83	0.71	0.61	0.64	0.55
2011	0.41	0.52	0.62	0.75	0.63	0.54	0.55	0.58	0.81	0.84	0.71	0.62	0.63	0.56
2012	0.43	0.51	0.58	0.75	0.63	0.55	0.53	0.57	0.83	0.83	0.71	0.61	0.61	0.57
2013	0.41	0.55	0.56	0.74	0.62	0.57	0.52	0.55	0.81	0.83	0.70	0.60	0.63	0.58
2014	0.38	0.57	0.60	0.74	0.64	0.58	0.54	0.56	0.80	0.83	0.73	0.61	0.64	0.59
2015	0.39	0.63	0.58	0.78	0.68	0.59	0.60	0.57	0.79	0.83	0.72	0.63	0.64	0.61

Table 2, continued

Panel B: Percentage Change in the Number of Clients from the Previous Year (2000-2015)

Year	Ernst & Young LLP	Deloitte & Touche LLP	KPMG	PricewaterhouseCoopers LLP	Arthur Andersen LLP
2000-2003	128.46	88.48	85.61	73.49	-100.00
2004-2007	-16.08	-13.41	-27.26	29.60	
2008-2015	-7.31	-6.92	1.00	3.92	

Panel C: Big-5/4 Market Share Change from 2000 to 2015 by Asset Quintiles

Quintile Ranking	Big-4/5 Market Share 2015 %	Big-4/5 Market Share 2000 %
1	8.89	56.80
2	41.18	84.29
3	64.41	85.94
4	75.74	91.90
5	93.62	99.13

Table 2, continued

Panel D: Fraction of firms audited by Second Tier Auditors (2000-2015)

	Agricu	Min&Constr	Food	Textile	Chemicals	Pharma	Extractive	Durable	Transp	Utilities	Retail	Services	Comp	Total
2000	0.00	0.09	0.08	0.08	0.05	0.06	0.04	0.07	0.03	0.05	0.08	0.04	0.07	0.06
2001	0.00	0.05	0.11	0.08	0.03	0.08	0.04	0.07	0.04	0.03	0.08	0.06	0.07	0.07
2002	0.00	0.03	0.08	0.07	0.02	0.07	0.04	0.08	0.03	0.02	0.08	0.07	0.06	0.06
2003	0.00	0.03	0.07	0.05	0.03	0.08	0.06	0.09	0.03	0.02	0.08	0.08	0.07	0.07
2004	0.00	0.04	0.07	0.06	0.02	0.08	0.08	0.10	0.04	0.03	0.08	0.09	0.10	0.08
2005	0.00	0.04	0.06	0.06	0.05	0.08	0.09	0.11	0.05	0.03	0.10	0.10	0.11	0.09
2006	0.00	0.05	0.07	0.07	0.05	0.09	0.10	0.11	0.06	0.04	0.10	0.10	0.12	0.09
2007	0.05	0.05	0.05	0.09	0.04	0.09	0.09	0.13	0.06	0.04	0.09	0.12	0.12	0.10
2008	0.04	0.05	0.06	0.09	0.03	0.10	0.09	0.12	0.06	0.04	0.10	0.13	0.12	0.10
2009	0.04	0.06	0.05	0.10	0.03	0.10	0.09	0.12	0.07	0.04	0.09	0.12	0.11	0.10
2010	0.08	0.04	0.04	0.06	0.03	0.06	0.06	0.08	0.04	0.03	0.06	0.08	0.08	0.07
2011	0.04	0.05	0.04	0.06	0.03	0.06	0.06	0.09	0.04	0.03	0.05	0.07	0.08	0.06
2012	0.00	0.04	0.02	0.05	0.01	0.02	0.06	0.06	0.03	0.03	0.04	0.05	0.05	0.04
2013	0.00	0.04	0.02	0.05	0.01	0.03	0.07	0.05	0.03	0.02	0.03	0.04	0.04	0.04
2014	0.00	0.04	0.01	0.04	0.01	0.03	0.08	0.06	0.04	0.03	0.03	0.04	0.04	0.04
2015	0.00	0.03	0.01	0.04	0.02	0.03	0.09	0.07	0.05	0.02	0.04	0.04	0.04	0.04

Panel A describes the market shares (the ratio of the Big-5/4 market share divided by the total market share) by each industry from the 2000 to 2015 (in percentage), which we define as SOX effect. Panel B indicates the declines of total market share for surviving Big-N firms. Panel C describes Big-5/4 market share change from 2000 to 2015 by asset quintiles. The results show that Big-4/5 market share decreases the most in the lowest asset quintile. However, it randomly raises in the highest asset quintile. Panel D shows the market share for second tier audit firms (in decimal).

Table 3
Descriptive Statistics (2000-2015)

Panel A: Univariate Statistics

Variable	Mean	Std. Dev.	Q1	Median	Q3
Switch	0.02	0.12	0.00	0.00	1.00
Change_abafee	0.00	0.53	-3.54	-0.01	3.00
NB-4 Market Share 2000	0.17	0.03	0.12	0.17	0.25
AA Market Share 2000	0.18	0.05	0.07	0.16	0.33
Growth	0.15	0.68	-0.80	0.05	10.37
Abasdacc	0.12	0.38	0.00	0.07	8.27
Invrec	0.24	0.18	0.00	0.21	0.89
Opinion	0.04	0.19	0.00	0.00	1.00
Modified_opinion	0.04	0.19	0.00	0.00	1.00
Tenure	8.05	2.73	1.00	10.00	10.00
ROA	-0.05	0.41	-7.72	0.03	0.40
Loss	0.34	0.47	0.00	0.00	1.00
Leverage	0.18	0.22	0.00	0.12	1.39
Cash	0.22	0.23	0.00	0.13	0.97
Mismatch	0.28	0.45	0.00	0.00	1.00
Size	6.23	2.18	-1.14	6.28	11.00
Merger	0.42	0.49	0.00	0.00	1.00

Table 3, continued

Panel B: Pearson Correlations

	1	2	3	4	5	6	7	8
1 Switch	1.000							
2 ΔAbafee	-0.017*	1.000						
3 NB-4 Market Share 2000	-0.0127*	0.015*	1.000					
4 AA Market Share 2000	-0.002	0.003	-0.365*	1.000				
5 Growth	0.055*	-0.081*	-0.031*	-0.001	1.000			
6 Abasdacc	0.040*	-0.025*	-0.054*	-0.015*	0.358*	1.000		
7 Invrec	0.004	0.028*	0.293*	-0.270*	-0.102*	-0.069*	1.000	
8 Opinion	0.004	0.010*	-0.040*	-0.015*	-0.030*	0.254*	-0.006	1.000
9 Modified_opinion	0.0038	0.010	-0.040*	-0.015*	-0.029*	0.254*	-0.007	0.995*
10 Tenure	-0.010*	0.027*	0.051*	0.001	-0.036*	-0.107*	-0.071*	-0.148*
11 ROA	-0.025*	0.0010	0.099*	0.064*	-0.043*	-0.649*	0.095*	-0.400*
12 Loss	0.020*	-0.037*	-0.122*	-0.083*	-0.021*	0.175*	-0.109*	0.238*
13 Leverage	-0.008	0.004	-0.045*	0.200*	-0.034*	0.014*	-0.161*	0.027*
14 Cash	0.011*	-0.034*	-0.191*	-0.220*	0.137*	0.132*	-0.321*	0.044*
15 Mismatch	0.026*	0.033*	-0.061*	-0.118*	-0.049*	0.053*	0.049*	0.110*
16 Size	-0.043*	-0.009	0.026*	0.100*	0.059*	-0.154*	-0.202*	-0.279*
17 Merger	-0.006	-0.026*	0.047*	-0.041*	0.092*	-0.050*	0.022*	-0.111*

	9	10	11	12	13	14	15	16
9 Modified_opinion	1.000							
10 Tenure	-0.148*	1.000						
11 ROA	-0.402*	0.160*	1.000					
12 Loss	0.238*	-0.209*	-0.432*	1.000				
13 Leverage	0.025*	0.036*	-0.033*	0.027*	1.000			
14 Cash	0.045*	-0.068*	-0.240*	0.304*	-0.324*	1.000		
15 Mismatch	0.111*	-0.097*	-0.180*	0.251*	-0.209*	0.297*	1.000	
16 Size	-0.279*	0.412*	0.297*	-0.435*	0.107*	-0.199*	-0.472*	1.000
17 Merger	-0.111*	0.122*	0.127*	-0.186*	0.055*	-0.221*	-0.234*	0.312*

Table 4
Determinants of Fee Premium Metrics (2000-2011)

Dependent Variable: LAF	Column I: 2000-2002			Column II: 2003-2015		
	a			b		
	Coef.	Z	P-value	Coef.	Z	P-value
Big-5/4	0.153	2.26	0.02	0.210	16.94	0.00
LTA	0.474	110.04	0.00	0.524	202.40	0.00
CR	-0.051	-22.70	0.00	-0.040	-24.28	0.00
CA_TA	0.625	13.98	0.00	0.860	30.58	0.00
ARINV	0.210	4.36	0.00	0.064	2.09	0.04
ROA	-0.204	-11.28	0.00	-0.147	-13.87	0.00
Loss	0.140	9.80	0.00	0.179	19.41	0.00
Foreign	0.261	17.60	0.00	0.311	34.78	0.00
Merger	0.055	3.73	0.00	0.060	6.95	0.00
Busy	0.079	5.47	0.00	0.080	9.44	0.00
LEV	0.049	1.89	0.06	0.048	3.60	0.00
Intang	0.425	9.46	0.00	0.570	22.75	0.00
SEG	0.068	4.29	0.00	0.052	5.05	0.00
Opinion	0.303	9.30	0.00	0.200	8.47	0.00
MatWeak	0.469	11.29	0.00	0.319	25.74	0.00
Intercept	0.153	2.26	0.02	0.210	16.94	0.00
Industry Dummies			Yes			Yes
N			8,776			21,101
Adjusted R ²			0.737			0.817

Table 5
Auditor Switch Model

Panel A: Auditor Switching Model

	Column I: 2003-2015						Column II: 2000-2002					
	a			b			a			b		
	Coef.	z	P-value	Coef.	z	P-value	Coef.	z	P-value	Coef.	z	P-value
ΔAbafee	-0.295	-7.95	0.00	-0.295	-8.25	0.00	0.023	0.28	0.78	0.021	0.26	0.80
NB-4 Market Share 2000	-2.007	-2.01	0.04				-2.374	-1.34	0.18			
AA Market Share 2000				-1.772	-1.21	0.23				0.223	0.19	0.85
Growth	0.185	6.83	0.00	0.187	7.27	0.00	0.127	2.98	0.00	0.126	2.95	0.00
ABSDACC	0.092	1.88	0.06	0.091	1.85	0.07	0.102	0.93	0.35	0.101	0.92	0.36
ARINV	-0.822	-2.09	0.04	-1.078	-2.10	0.04	0.350	1.06	0.29	0.279	0.81	0.42
Opinion	-0.254	-1.95	0.05	-0.250	-1.84	0.07	9.119	0.02	0.98	10.123	0.02	0.99
Modop	-0.184	-2.96	0.00	-0.202	-3.03	0.00	-9.222	-0.02	0.98	-10.218	-0.02	0.99
Tenure	-0.220	-22.61	0.00	-0.222	-22.45	0.00	-0.034	-2.07	0.04	-0.035	-2.11	0.03
ROA_L	-0.198	-5.53	0.00	-0.190	-4.76	0.00	-0.086	-0.51	0.61	-0.088	-0.53	0.60
Loss_L	-0.094	-2.26	0.02	-0.094	-2.24	0.03	-0.216	-1.66	0.10	-0.206	-1.59	0.11
LEV_L	0.064	0.79	0.43	0.106	1.18	0.24	-0.278	-0.98	0.33	-0.268	-0.94	0.35
Cash	-0.176	-0.79	0.43	-0.263	-0.81	0.42	-0.195	-0.70	0.49	-0.152	-0.53	0.60
Mismatch	1.492	14.91	0.00	1.488	15.71	0.00	0.041	0.27	0.79	0.053	0.34	0.73
Size	0.127	5.56	0.00	0.125	5.34	0.00	0.018	0.54	0.59	0.021	0.63	0.53
M&A	0.361	4.12	0.00	0.343	3.57	0.00	-0.055	-0.49	0.63	-0.052	-0.46	0.65
Intercept	-4.424	-22.34	0.00	-4.336	-7.04	0.00	-2.101	-5.09	0.00	-2.551	-6.35	0.00
N			23,521			23,521			6,355			6,355
Pseudo R ²			0.058			0.058			0.010			0.023

Table 5, continued

Panel B: Auditor Resignation and Auditor Dismiss

Auditor Switch Model (2003-2015)									
	Auditor Dismissal			Auditor Resignation			Unclassified Switch		
	Column I			Column II			Column III		
	Coef.	z	P-value	Coef.	z	P-value	Coef.	z	P-value
ΔAbafee	-0.315	-23.55	0.00	0.274	12.52	0.00	-0.334	-7.77	0.00
NB-4 Market Share 2000	-0.804	-4.54	0.00	0.040	0.05	0.96	-1.649	-1.90	0.06
Growth	0.033	1.40	0.16	0.162	8.34	0.00	0.202	8.47	0.00
ABSDACC	0.061	1.59	0.11	-0.116	-2.47	0.01	0.092	1.71	0.09
ARINV	0.201	5.50	0.00	0.250	4.38	0.00	-0.239	-0.67	0.50
Opinion	1.390	115.33	0.00	0.287	12.04	0.00	0.206	1.84	0.07
Modop	-1.939	-55.83	0.00	0.136	2.15	0.03	-0.837	-13.16	0.00
Tenure	-0.314	-33.71	0.00	-0.341	-43.66	0.00	-0.233	-16.71	0.00
ROA_L	0.023	0.84	0.40	-0.083	-2.38	0.02	-0.241	-6.69	0.00
Loss_L	-0.031	-0.91	0.37	0.294	6.06	0.00	-0.216	-5.00	0.00
LEV_L	0.066	2.15	0.03	-0.132	-2.04	0.04	0.211	2.52	0.01
Cash	-0.272	-5.56	0.00	0.802	7.23	0.00	0.089	0.42	0.68
Mismatch	-0.441	-30.10	0.00	-1.762	-17.67	0.00	1.212	10.94	0.00
Size	-0.023	-5.36	0.00	-0.131	-8.64	0.00	0.125	5.84	0.00
M&A	-0.062	-6.03	0.00	-0.290	-23.39	0.00	0.341	3.78	0.00
Intercept	0.082	2.88	0.00	-1.222	-11.39	0.00	-4.432	-19.58	0.00
N			22,710			21,459			21,686
Pseudo R ²			0.104			0.178			0.051
Switches			1,543			292			519
Chi ² test: ΔAbafee	Column I = Column II			Chi ² = 22.54			p-value = 0.000		
	Column II = Column III			Chi ² = 3.85			p-value = 0.049		
	Column I = Column III			Chi ² = 0.01			p-value = 0.938		
Chi ² test: NB-4 Market Share 2000	Column I = Column II			Chi ² = 0.16			p-value = 0.686		
	Column II = Column III			Chi ² = 0.20			p-value = 0.652		
	Column I = Column III			Chi ² = 0.05			p-value = 0.816		

Note: The observations in each column include 21,167 non-switching firms and the particular type of switching firm. The auditor dismissal column uses 21,167 + 1543, the resignation sample 21,167 + 292 and the unclassified sample 21,167 + 519.

Table 5, continued

Panel C: Audit Switching model by prior AA clients and non-prior AA clients

Audit Switching Model (2003-2015)						
	Non-prior AA clients			Prior AA clients		
	Column I			Column II		
	Coef.	z	P-value	Coef.	z	P-value
Δ Abafee	-0.347	-8.03	0.00	0.728	21.63	0.00
NB-4 Market Share 2000	-1.822	-1.76	0.08	-4.188	-6.65	0.00
Growth	0.185	6.81	0.00	-2.343	-21.49	0.00
ABSDACC	0.062	1.46	0.14	-0.328	-9.39	0.00
ARINV	-0.693	-1.75	0.08	-2.614	-26.88	0.00
Tenure	-0.237	-25.39	0.00	0.037	6.34	0.00
ROA_L	-0.165	-3.90	0.00	2.044	11.08	0.00
Loss_L	-0.157	-3.59	0.00	0.350	6.01	0.00
LEV_L	0.158	2.01	0.04	-2.167	-24.73	0.00
Cash	-0.174	-0.76	0.45	0.315	3.66	0.00
Mismatch	1.544	13.84	0.00	0.958	20.57	0.00
Size	0.134	6.78	0.00	0.218	5.93	0.00
M&A	0.381	4.01	0.00	0.202	5.95	0.00
Intercept	-4.375	-25.72	0.00	-6.646	-22.07	0.00
N			20,588			2,933
Pseudo R ²			0.064			0.060

Table 5, continued

Panel D: Switch Model 2003-2015 by Assets Quintiles

Test Variables	AT1			AT2			AT3			AT4			AT5		
	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value
ΔAbafee	0.22	1.86	0.06	-0.77	-62.90	0.00	-0.07	-23.01	0.00	-0.99	-6.70	0.00	-0.62	-26.46	0.00
NB-4 Market Share 2000	-13.85	-5.93	0.00	4.64	1.06	0.29	-5.65	-23.95	0.00	-1.40	-0.67	0.50	1.99	4.96	0.00
Stand by control variables are included			Yes			Yes			Yes			Yes			Yes
Intercept	-3.72	-7.54	0.00	-5.42	-8.38	0.00	-6.96	-141.44	0.00	-0.72	-0.70	0.49	-7.57	-40.75	0.00
N			4,138			4,310			4,720			5,024			5,329
Pseudo R2			0.155			0.099			0.069			0.099			0.050
Switches			704			541			452			323			334

Panel E: Dismissal or Resignation Subsample by Assets Quintiles

	AT1									AT2								
	Dismissal			Resignation			Unclassified			Dismissal			Resignation			Unclassified		
	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value
ΔAbafee	-0.10	-3.64	0.00	0.11	4.87	0.00	0.32	2.11	0.04	-0.35	-45.76	0.00	0.27	11.05	0.00	-0.65	-59.71	0.00
NB-4 Market	-0.85	-2.83	0.01	6.68	7.75	0.00	-7.79	-1.92	0.06	1.61	6.30	0.00	-9.96	-14.50	0.00	3.50	0.73	0.47
Stand by control variables are included			Yes			Yes			Yes			Yes			Yes			Yes
Intercept	-0.40	-4.64	0.00	-3.55	-24.06	0.00	-4.79	-4.88	0.00	-1.03	-15.90	0.00	-0.49	-2.64	0.01	-6.20	-9.34	0.00
N			4,138			4,138			4,138			4,310			4,310			4,310
Pseudo R2			0.092			0.172			0.149			0.123			0.147			0.081
Switches			431			136			137			331			68			142

Table 5 Panel E, continued

	AT3									AT4								
	Dismissal			Resignation			Unclassified			Dismissal			Resignation			Unclassified		
	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value
ΔAbafee	-0.63	-66.01	0.00	0.35	33.14	0.00	-0.07	-21.40	0.00	-0.36	-12.15	0.00	0.31	12.48	0.00	-0.99	-6.70	0.00
NB-4 Market	-3.49	-11.53	0.00	-0.68	-2.67	0.01	-6.01	-26.03	0.00	1.23	3.13	0.00	-6.42	-8.44	0.00	-1.40	-0.67	0.50
Stand by control variables are included			Yes			Yes			Yes			Yes			Yes			Yes
Intercept	0.12	1.92	0.06	-1.63	-30.65	0.00	-7.57	-163.12	0.00	-0.01	-0.06	0.96	-1.11	-18.76	0.00	-0.72	-0.70	0.49
N			4,720			4,720			4,720			5,024			5,024			5,024
Pseudo R2			0.102			0.102			0.077			0.086			0.131			0.099
Case No.			301			42			109			235			20			68
AT5																		
	Dismissal			Resignation			Unclassified			Dismissal			Resignation			Unclassified		
	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value
ΔAbafee	-0.06	-7.05	0.00	0.81	3.85	0.00	-0.62	-26.46	0.00									
NB-4 Market	-2.63	-3.32	0.00	3.74	2.74	0.01	1.99	4.96	0.00									
Stand by control variables are included			Yes			Yes			Yes			Yes			Yes			Yes
Intercept	0.88	4.57	0.00	-4.95	-7.23	0.00	-7.57	-40.75	0.00									
N			5,329			5,329			5,329									
Pseudo R2			0.076			0.071			0.050									
Case No.			245			26			63									

Panel A shows the results of auditor choice model over the years 2000-2015. Column I covers the period 2003 to 2015 whereas Column II covers the sub-period 2000-2002. Column IV examine whether the clients switching behavior changed after SOX. ΔAbafee is the change in residual fee. The Mismatch variable is based on Landsman et al. (2009) in Appendix B. As we limit our sample to firms only audited by Big-4 in 2002, we use Big4* Mismatch in our regressions (i.e., to see if mismatched clients with the Big-5/4 were more likely to switch to NB-5/4). Our sample exhibits properties similar to the previous study (see Appendix B). Our results show that clients are *less* likely to switch if they are paying a *higher* premium (in the post-SOX period) and *less likely* (marginal significant) to switch in the years 2000-2015 in industries where NB-4 had a larger market share *in 2000*. Panel B separate auditor switch by auditor dismissal, auditor resignation, and the other switch in the years 2003-2015. Column I shows the results of auditor dismissal. Column II shows the results of auditor resignation. Column III shows the results of the other switch. Panel C separate the sample into prior AA clients and non-prior AA clients and find results only in the non-prior AA clients sample after 2002. Column I shows the results of non-prior AA clients sample. Column II show prior AA clients sample. Panel D shows switch model by asset quintiles from 2003-2015. Panel E shows dismissal and resignation subsamples by asset quintiles.

Table 6**Propensity Score Matching****Panel A: Summary Statistics in Change of Abnormal Audit Fee**

	N	Mean	Median	Std Deviation
Switching Firms	530	-0.069	-0.072	0.666
Non-switching Firms	524	-0.002	-0.007	0.525
Difference	-0.067	t = -16.929	p-value = 0.000	

Panel B: Summary Statistics in Abnormal Audit Fee

	N	Mean	Median	Std Deviation
Switching Firms	530	-0.508	-0.564	0.717
Non-switching Firms	524	-0.083	-0.030	0.644
Difference	-0.425	t = -2.7301	p-value = 0.0063	

The sample is matched on the probability audited by BIG-4 based on Appendix B, and we match the sample and find 524 firms matching with the probability difference smaller than 0.00012, and we try to compare the fee premium, and Panel A show that non-switching firms have a lower premium change than switching firms. Panel B show that non-switching firms been charged higher premium than switching firms.

Table 7 Additional Tests

Panel A: Busy and Non-Busy Seasons

	Dec FY end			Non-Dec FY end		
	Coef.	Z	P-value	Coef.	Z	P-value
ΔAbafee	-0.47	-8.52	0.00	0.16	2.44	0.02
NB-4 Market Share 2000	-0.87	-1.95	0.05	-6.07	-1.67	0.10
Mismatch	1.33	21.49	0.00	1.84	9.35	0.00
Stand by control variables are included			Yes			Yes
Intercept	-4.00	-14.29	0.00	-5.50	-22.42	0.00
N			15,968			7,553
Pseudo R2			0.07			0.07

Panel B: Dismissal & Resignation Subsample Busy and Non-Busy Seasons

	Dismissal						Resignation					
	Dec FY end			Non-Dec FY end			Dec FY end			Non-Dec FY end		
	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value	Coef.	Z	P-value
ΔAbafee	-0.25	-11.36	0.00	-0.45	-60.72	0.00	0.31	9.14	0.00	0.21	7.68	0.00
NB-4 Market Share 2000	-1.62	-8.49	0.00	1.20	3.68	0.00	-0.78	-0.94	0.35	0.86	1.06	0.29
Mismatch	-0.37	-16.98	0.00	-0.47	-9.64	0.00	-1.35	-12.20	0.00	-2.95	-88.69	0.00
Stand by control variables are included			Yes			Yes			Yes			Yes
Intercept	0.05	1.07	0.29	-0.30	-5.14	0.00	-1.16	-12.25	0.00	-2.30	-23.53	0.00
N			15,968			7,553			15,968			7,553
Pseudo R2			0.10			0.11			0.17			0.16

	Unclassified					
	Dec FY end			Non-Dec FY end		
	Coef.	Z	P-value	Coef.	Z	P-value
ΔAbafee	-0.40	-6.90	0.00	0.01	0.31	0.76
NB-4 Market Share 2000	-0.42	-0.83	0.41	-5.28	-1.53	0.13
Mismatch	1.12	13.91	0.00	1.60	6.84	0.00
Stand by control variables are included			Yes			Yes
Intercept	-4.19	-13.02	0.00	-6.87	-46.17	0.00
N			15,968			7,553
Pseudo R2			0.06			0.05

Table 7, continued

Panel C: Accelerated filers and Non-accelerated filers

	Non-accelerated filer			Accelerated filer		
	Coef.	Z	P-value	Coef.	Z	P-value
Δ Abafee	0.353	3.41	0.001	-0.601	-54.9	0.000
NB-4 Market Share 2000	-12.839	-4.71	0.000	-0.168	-0.15	0.882
Mismatch	3.779	34.46	0.000	0.886	6.11	0.000
Stand by control variables are included			Yes			Yes
Intercept	-4.324	-7.33	0.000	-4.333	-28.12	0.000
N			3,854			19,667
Pseudo R2			0.170			0.042

Table 7, continued

Panel D: Switch Model 2003-2014 by Years

Test Variables	2003-2010			2003-2011			2003-2012			2003-2013			2003-2014		
	Coef.	Z	P	Coef.	Z	P	Coef.	Z	P	Coef.	Z	P	Coef.	Z	P
Δ Abafee	-0.339	-398.39	0.000	-0.383	-59.48	0.000	-0.346	-53.12	0.000	-0.345	-38.16	0.000	-0.295	-7.94	0.000
NB-4 Market Share 2000	-1.620	-23.89	0.000	-1.621	-3.1	0.002	-1.393	-1.15	0.249	-1.761	-1.48	0.140	-2.013	-2.02	0.043
Mismatch	1.327	147.67	0.000	1.254	58.73	0.000	1.410	15.61	0.000	1.421	14.94	0.000	1.492	14.92	0.000
Stand by control variables are included			Yes			Yes			Yes			Yes			Yes
Intercept	-5.110	-709.6	0.000	-4.911	-31.4	0.000	-4.886	-37.46	0.000	-4.672	-42.42	0.000	-4.424	-22.32	0.000
N			17,460			19,094			20,652			22,121			23,500
Pseudo R ²			0.043			0.045			0.052			0.054			0.058

Panel A We use Dec 31st fiscal year-end as a benchmark for busy season. Panel B separates Dismissal, Resignation subsamples into busy and non-busy seasons, and we find our results hold in both samples, mitigating concerns about capacity issues. Panel C shows subsamples of accelerated and non-accelerated filers. Panel D presents the results by different samples across time. Our results hold in each of these subsamples.