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THE EFFECTS OF SIGNIFICANT CHANGES IN AUDITOR CLIENTELE AND AUDITOR-CLIENT MISMATCHES ON AUDIT QUALITY

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KENNETH L. BILLS
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THE EFFECTS OF SIGNIFICANT CHANGES IN AUDITOR CLIENTELE AND AUDITOR-CLIENT MISMATCHES ON AUDIT QUALITY

A DISSERTATION APPROVED FOR THE
MICHAEL F. PRICE COLLEGE OF BUSINESS

BY

_____
Dr. Kevan L. Jensen, Chair

_____
Dr. Louis H. Ederington

_____
Dr. Dipankar Ghosh

_____
Dr. Robert C. Lipe

_____
Dr. Wayne B. Thomas

DEDICATION

I dedicate this dissertation to my wife, Jamie, who makes my life a joy to live and to my parents who have always encouraged me to do the best that I can at every worthwhile endeavor I choose to pursue.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

This study contributes to the current debate on mandatory audit firm rotation by investigating how possible consequences of mandating audit firm rotation may affect audit quality. I find that audit offices with large increases in their clientele (strained capacity) or decreases in their clientele (excess capacity) have significantly lower audit quality as measured by the absolute value of discretionary accruals. I find evidence of a smaller effect for larger audit firms with strained capacity supporting a reputational or flexibility hypothesis. Additionally, audit offices with strained capacity are more likely to issue going-concern opinions to companies that do not subsequently go bankrupt (Type I errors). I further investigate the effect of strained and excess capacity on an audit firm's client acceptance decisions and find that mismatches, where a large audit firm accepts a client expected to be served by a small audit firm, are less likely to occur when a large audit firm has strained capacity. Finally, I investigate the effect of auditor-client mismatches on audit quality. I find that audit quality is positively affected when a large audit firm performs the audit for a company expected to be served by a smaller audit firm and is negatively affected when a small audit firm performs the audit for a company expected to be served by a larger audit firm.

I. INTRODUCTION

In this study, I investigate the effects of strained and excess capacity on audit firms' audit quality and portfolio management decisions. I also test whether such effects are contingent upon the size and structure of the audit firm. I further test whether auditor-client mismatches affect audit quality. This study is motivated in part by two important current issues being addressed by auditing regulators. The first is a current heated public discourse about mandatory rotation for auditors of public companies. Mandatory audit firm rotation would add volatility to audit firms' clientele portfolios, potentially making it more difficult for audit firms to plan for, and adequately adjust their levels of available capacity. Additionally, mandatory audit firm rotation may increase the rate of auditor-client mismatches, especially where there are few rotation options available. Second, a technical committee of the International Organization of Securities Commissions (IOSCO) issued a paper in 2008 implying that regulators have serious concerns about the effects that significant changes in audit firm capacity may have on the audit market. My study seeks to provide evidence that will be useful to regulators and practitioners as they make decisions that affect the capacity of audit firms to provide audit services.

On August 16, 2011, the Public Company Accounting Oversight Board (PCAOB) issued a concept release requesting comments from the public about setting term limits for auditors of public companies (see PCAOB 2011). There are two camps arguing their side of this divisive issue. Both sides have strong opinions about the effect of audit firm tenure on audit quality, and their arguments are lengthy. The first camp is concerned about the coziness that may develop between public companies and what are

supposed to be their *independent* auditors as long-term relationships are established. The second camp argues that there may be no viable rotation opportunities for some companies, that the cost of audit firm rotation is high, and that the development of company-specific knowledge through longer auditor tenures may actually improve audit quality.[1] My study provides evidence on an important consideration in this debate. Mandating audit firm rotation would result in significant fluctuations in audit firm client portfolios, which may make it difficult for audit firms to plan for and adequately adjust their levels of capacity. When an audit firm has significant fluctuations in its clientele resulting in either strained or excess capacity, it has the potential to impact audit quality and influence audit firms' portfolio management decisions. My study provides evidence on these relations. Additionally, mandatory audit firm rotation may increase auditor-client mismatches where larger audit firms perform the audits of clients expected to be served by smaller firms and vice versa. My study provides evidence about how such mismatches affect audit quality.

A related issue which has concerned regulators is the concentration of audit firms and its implications for audit quality. With the SEC's decision to effectively shut down Arthur Andersen, there has been considerable debate about the effects that disruptions in the capacity of a single audit firm to provide audit services may have on the audit market. In May 2008, a technical committee of the International Organization of Securities Commissions issued a paper (IOSCO 2008) on contingency planning for

[1] For research investigating the last claim, see Johnson et al. (2002), Geiger and Raghunandan (2002), Myers et al. (2003), and Ghosh and Moon (2005).

events and conditions that affect the availability of audit services.[2] The IOSCO study considers catastrophic events that may result in the complete or partial removal of an international audit firm from a geographic area (e.g. the demise of Arther Anderson, ChuoAoyama, and Leventhal & Horwath). My study seeks to provide evidence that will be useful to regulators and practitioners as they make decisions that affect the ability of audit firms to provide audit services by examining more frequent, less severe changes in audit firm capacity. This may aid regulators in better understanding the market forces which take effect when there are changes in audit firm capacity.

My study provides empirical evidence about the effects of city-level changes in audit firm capacity which occur due to significant changes in audit firms' clientele. In this study, I use theory from the auditor reputation, production economics, operations management, and assortative matching literatures to develop hypotheses about the effects of strained and excess capacity on a local audit office's audit quality and portfolio management decisions. I utilize significant changes in a local audit office's clientele as a proxy for periods of strained and excess audit firm capacity.

I find that strained and excess capacity at audit offices result in lower audit quality as measured by absolute values of performance-matched discretionary accruals. I also find evidence that the negative effect of strained capacity is smaller for clients audited by the Big 4 or second-tier audit firms.[3] Results further show that strained capacity at audit offices results in a greater number of Type I going-concern opinion

[2] Membership in the IOSCO includes securities commissions or principal financial regulators from over 100 member countries. IOSCO (2008) emphasizes regulators' concerns about the effects of significant changes in the available capacity of audit firms.

[3] In this study, second-tier audit firms include Grant Thornton, BDO Seidman, McGladrey & Pullen, and Crowe Horwath. These audit firms and the Big 4 audit firms are those required to be inspected by the PCAOB on an annual basis.

errors, however, neither strained nor excess capacity is associated with the occurrence of Type II going-concern opinion errors.

Additional results show that strained capacity results in a lower likelihood of auditor-client mismatches where a client that is expected to be served by a small audit firm is served by a large audit firm. Results further show that clients expected to be served by small audit firms that are served by large audit firms have lower absolute values of discretionary accruals even after matching on probability of selecting a large audit firm. Finally, in a matched sample design, results indicate that clients typically served by large audit firms that are served by smaller audit firms have greater absolute values of discretionary accruals.

This study contributes to current literature in a number of ways. First, it addresses an area of concern for both the PCAOB and the IOSCO. It adds to the audit firm portfolio management literature by investigating the effects of significant increases and decreases in clientele on local offices' client-acceptance decisions. Further, it provides evidence on the differential effects of audit market changes on Big 4 and second-tier audit firms versus smaller firms. Finally, this study investigates the effects of two types of auditor-client misalignments on audit quality.

The remainder of this paper proceeds as follows. Section II summarizes the background literature and key concepts that are important to this study. Section III describes the development of testable hypotheses. Section IV describes the sample used in this study and illustrates the methodology used to test the hypotheses. Section V illustrates results, robustness checks, and limitations of the study. Section VI summarizes and concludes.

II. BACKGROUND

Audit firms are similar to other service firms in that they provide a perishable asset. That is, they employ a workforce with the capacity to provide labor inputs that expire if not used (Sasser 1976; Weatherford and Bodily 1992). As such, audit firms are faced with important decisions that affect the capacity of their firms to provide audit services. These decisions include those that affect the levels of available inputs such as decisions about staffing, length of working-days, and firm expansion. These decisions affect the efficient use of available inputs, such as use of technology, training, incentives, and allocation of resources. Auditing firms then make decisions about the supply of their firms' services through client-acceptance and continuance decisions. External forces such as changes in economic conditions and client-initiated changes also impact an audit firm's capacity to provide services.

Considering the market for assurance services broadly as a dynamic and complex set of matching and resource allocation decisions, factors that affect audit firm capacity have the potential to significantly impact all parts of the audit industry. For example, factors that affect an audit firm's capacity, be it through choice or external forces, have a direct impact on an audit firm's short- and long-term profitability as well as on its current and future opportunity set. In addition, such factors may have direct and indirect effects on such important areas as audit quality, competition, portfolio management, audit pricing, and industry specialization. In light of this, extant auditing research has just brushed the surface of investigating the impact that auditor capacity has in the audit market.

Prior studies related to the demand for audit services operationalize differences

in the demand on audit firm capacity by either using audit firms' peak versus nonpeak periods or by utilizing a quasi-experimental setting where there is an external shock which causes a significant change in the demand for audit services. In the following pages, I summarize prior literature on these measures and provide background information about how differences in the demand on audit firm capacity relate to audit quality and auditor portfolio management decisions.

Relevant Auditing Research on Audit Firm Capacity

There is substantial research which investigates the potential negative consequences of audit work being performed during an auditor's peak period ("busy season") and potential benefits of audit work performed during the nonpeak period. Hay et al. (2006) provide a useful summary of this line of literature. For auditors of public and nonpublic companies, this peak period is driven by the fact that the majority of these companies have December 31 year ends. For auditors of governmental agencies and not-for-profits, the peak period is due to the majority of these entities having a June 30 year end. In essence, busy season is a "bottleneck," or a stage in which the performance of a system is constrained (Mukherjee and Chatterjee 2006). Specifically, although the capacity of an audit firm may be used at or near its fullest extent during busy season, capacity is not sufficient to keep work from piling up.

Two studies provide some evidence about the effect of auditor's busy season on audit quality. Johnstone and Bedard (2001) find weak evidence that less audit effort is used for busy season audits. If auditor effort is positively correlated with audit quality, then these results suggest that audit quality may be lower for busy season clients. Lambert et al. (2011) find, however, that while increasing time pressure is positively

correlated with discretionary accruals, this relation is not greater during busy season. Regarding the effect of the busy season bottleneck on auditors' client acceptance decisions, Lopez et al. (2008) provide evidence that audit firms with client portfolios with workload heavily compressed during busy season (workload compression) are less likely to accept more busy season clients. Lopez and Peters (2011) provide evidence that auditor switches are more likely for audit firms with greater workload compression.

My study differs from these busy season studies in that it investigates the effect of excess and strained capacity in the context of significant changes in an audit firm's portfolio as opposed to an audit cycle bottleneck. In addition, I test characteristics of clients that will be selected under strained and excess capacity that have not been previously explored. My study further differs in that it investigates whether audit firm size affects the actions of local audit offices with excess or strained capacity.

One non-busy season study which investigates the effect of audit firm capacity constraints is Landsman et al. (2009). This study provides evidence that capacity constraints on audit firms due to the demise of Arthur Andersen and the influx of their clientele to other audit firms as well as the increased demands of the Sarbanes-Oxley Act resulted in an increased likelihood that high quality audit firms would shed clients with whom they were misaligned. Misalignments are defined as auditor-client alignments where high quality auditors are serving a client which is expected to be served by a lower quality auditor and vice versa. The results of Landsman et al. (2009) support the clientele-adjustment hypothesis (Johnson and Lys 1990; Shu 2000) that auditor switches are driven by changes over time in economic conditions and market competition.

My study differs from the Landsman et al. (2009) study in that I evaluate mismatches that occur at initial client acceptance as opposed to mismatches that occur as the characteristics of an audit client change over time. Unlike Landsman et al. (2009), strained capacity in this study is measured at the city level and is due to extreme changes in a local audit office's clientele as opposed to an external shock to the entire audit market. Further, my study is the first to investigate the effect that auditor-client mismatches have on audit quality.

Strained and Excess Capacity Caused by Major Changes in Local Audit Office Clientele

Strained Capacity

When local audit offices substantially expand their client base in a short period of time, they are likely to strain their capacity to provide audit services. There are several actions that local audit offices can take to reduce capacity strain such as hiring and outsourcing; however, successfully eliminating all capacity strain in the short term is unlikely when extreme changes in local audit office clientele occur. As in many service industries, auditing firms often build some degree of "cushion" into their available capacity that allows them to capitalize on new revenue opportunities. They also may have a limited amount of "flexible capacity," or the ability to use current employee overtime and/or outsourced services (Fine and Freund 1990; Gans and Zhou 2002). However, large increases in a local audit office's clientele would quickly subsume or at least put a significant strain on these two forms of reserved capacity. Audit firms may also expand their capacity through hiring. Both internal and market constraints such as the ability to hire, train, supervise, and retain employees, however,

make it difficult for audit firms to obtain large, rapid growth in their capacity through hiring.

Excess Capacity

When audit firms lose clientele either due to auditor or client choice, managing partners of these firms are left with the decision of how to deal with the resulting excess capacity. Available short-term options include seeking new engagements, allowing attrition, laying off employees, maintaining excess capacity, transferring employees, or some combination of the various options. Among these options, attrition is a relatively slow solution. While laying off employees is a quick way to eliminate excess capacity and is used occasionally in the auditing profession, it has significant costs. These costs include upsetting those terminated, remaining employees, potential future hires, suppliers of future hires, clients, and the community.[4] In addition, if the cost of laying off additional employees is nonlinear (increasing at an increasing rate) then the optimal level of workforce reduction may still include some degree of excess capacity.

Large Audit Firms' Ability to Transfer Personnel and Reputational Concerns

Local offices of the Big 4 and second-tier audit firms have an additional resource for addressing capacity needs that small audit firms do not have. The national offices at these firms are empowered to transfer personnel between local audit offices to where the need for personnel is greatest. This ability may reduce the likelihood that a significant change in audit firm clientele would lead to either strained or excess capacity. The ability to transfer personnel is constrained, however, by the willingness of employees to relocate.

[4] For example, see Harrington (2010).

In addition to differences in personnel management, the Big 4 and second-tier audit firms also have different reputational concerns than smaller audit firms. DeAngelo (1981b) introduces the theory that audit firm size is a valid proxy for audit quality because larger audit firms have "more to lose" in the form of quasi rents. Theoretically, quasi rents can be obtained by incumbent auditors because of the existence of significant switching costs. An incumbent auditor can charge clients more than the avoidable cost of an audit (can charge quasi rents) as long as the additional audit fees are less than the cost of switching. Large audit firms collecting quasi rents from a sizeable portfolio of clientele will then have a greater incentive to maintain independence and reduce audit risk related to any individual client.

A substantial amount of research supports this theory. Palmrose (1988) provides empirical evidence that Big 8 auditors are less likely to be litigated for malpractice than non-Big 8 auditors. Defond and Jiambalvo (1991) find that clients of Big 8 auditors have fewer accounting errors as revealed in prior period adjustments. Davidson and Neu (1993) find that clients of Big 8 auditors have smaller earnings forecast errors. Teoh and Wong (1993) show that clients of Big 8 auditors have statistically greater earnings response coefficients than clients of non-Big 8 auditors. Francis et al. (1999) and Becker et al. (1998) show that firms audited by Big 6 auditors have smaller amounts of discretionary accruals. Nelson et al. (2002) show that clients of non-Big 5 auditors are more likely to just meet-or-beat analyst forecasts. Hammersley et al. (2007) find that negative market reactions to the disclosure of internal control weaknesses are lower in magnitude when a firm is audited by a Big 4 auditor. Lennox and Pittman (2010) show that clients of Big 5 auditors are less likely to be investigated by the SEC for fraudulent

financial reporting.

In addition to Big 4/5/6/8 (hereafter Big 4) auditors, there are so-called "second-tier" auditors. These are international audit firms including Grant Thorton, BDO Seidman, McGladery and Pullen, and Crowe Horwath which have national offices, but are smaller than the Big 4. Like the Big 4, these audit firms are required to be inspected by the PCAOB on an annual basis. Evidence suggests that historically, these firms may have been perceived as having lower audit quality than Big 4 audit firms (Khurana and Raman 2004). Follow up studies, however, provide evidence that subsequent to the Sarbanes-Oxley Act of 2002 (SOX), the quality of audits provided by second-tier audit firms is not significantly different from the quality of audits provided by Big 4 firms both in fact and in perception. Weber and Willenborg (2003) reveal that opinions issued by second-tier audit firms are "comparably predictive to those of the Big 4." Cassell et al. (2011) find that after SOX, the ERCs of firms audited by second-tier auditors are not significantly different from those of firms audited by Big 4 firms. Krishnan et al. (2008) show that from the period 1998-2006, switching from a Big 4 auditor to a second-tier auditor did not result in an increase in abnormal accruals. Boone et al. (2010) replicate these results from the period 2003-2006 and further show that clients of Big 4 auditors and second-tier auditors have statistically similar *ex ante* costs of equity capital. However, they also find weak evidence that Big 4 auditors are more likely to issue going-concern opinions to distressed companies than second-tier firms.

Both Big 4 and second-tier auditors have formal structures and procedures in place to protect their reputations. They have established national offices which have a say in the client acceptance and client retention decisions of each local audit office.

National offices have an incentive to protect the reputation of the overall firm by reducing the audit risk related to any individual audit office. At times, and perhaps more often than might be expected, the national offices of these audit firms reject clients that local audit offices would otherwise accept.[5] Additionally, the Big 4 and second-tier audit firms have formal, internally-developed client acceptance procedures and audit pricing strategies which are developed at the national office level and mandated by firm policy.

In summary, considerable evidence exists that is consistent with the theory that the Big 4 and second-tier audit firms act to protect their reputation. There are then two distinct hypotheses which predict that local audit offices of the Big 4 and second-tier audit firms will be less affected by strained capacity than small audit firms. As discussed previously, the first hypothesis is that the Big 4 and second-tier audit firms have more flexibility to reduce strained capacity through transferring employees between local audit offices (flexibility hypothesis). The second hypothesis is that reputational concerns may result in constraints on the engagement performance and client-acceptance criteria of local audit offices of the Big 4 and second-tier audit firms (reputation hypothesis). Both the reputation and flexibility hypotheses predict that the effects of strained capacity on local audit offices' audit quality and client acceptance decisions will be smaller for local audit offices of the Big 4 and second-tier audit firms.

Changes in Local Audit Office Clientele and Audit Quality

I now consider the effects that significant increases in local audit office clientele

[5] Rejection rates of the Big 4 and other audit firms are not publicly available, although personal conversations with several audit partners from firms with national offices have suggested that rejections by the national office occur frequently at different stages of the client acceptance process.

may have on audit quality. I begin this literature review in the production economics literature. Lovelock (1984) and Sridharan (1998) describe the difficult task faced by managers of maintaining delivery dependability and quality in tightly constrained systems. For many service firms, capacity constraints lead to deterioration in quality. For example, in the restaurant industry, the service received by patrons generally declines as a restaurant reaches its full capacity. Likewise, customers at a mechanics shop may expect delays and poorer service when the shop is full.

Further analyzing these last two examples, strained capacity appears to potentially affect both a customer's "experience" as well as the "effectiveness" of the service. In a highly influential study, Parasuraman et al. (1985) outline the following ten distinguishable components to service quality: responsiveness, courtesy, access, communication, tangibles, security, credibility, competence, reliability, and understanding of the customer. While capacity constraints may put a strain on any or all of these ten components, I focus on the credibility, competence, and reliability of the audited financial statements which are similar to attributes of audit quality defined by DeAngelo (1981b). DeAngelo (1981b) describes audit quality as having two components. The first is the probability that the auditor will *detect* a material misstatement (competence). The second is the probability that the auditor will *report* the material misstatement (credibility and reliability).

Prior literature is mixed about whether strained auditor capacity has a significant impact on audit quality. Agoglia et al. (2010) provide evidence contrary to the hypothesis that audit quality is negatively affected by strained capacity. In a survey and experimental setting, they investigate the method of communication used by managers'

to communicate the results of reviews to audit staff. Prior literature has found that the use of in-person communication as opposed to electronic communication contributes to audit effectiveness (Brazel et al. 2004). Agoglia et al. (2010) find that reviewers are more likely to communicate via electronic means during busy season only when risk of misstatement is low. When risk of misstatement is high, managers communicate the results of their reviews in person.

On the contrary, Houston (1999) provides evidence in support of the hypothesis that audit quality is affected by capacity constraints. This study shows that fee pressure induces less responsiveness by auditors to increased risk in terms of both risk assessment and budgeted audit hours. In this study, audit seniors prepare a preliminary risk assessment for an audit engagement and create a preliminary time budget for audit procedures to be performed. The risk level of the audit engagement is then manipulated upward and those audit seniors where fee pressure is induced adjust their risk assessments and time budgets upward less than those audit seniors where fee pressure is not induced.

In summary, whether strained and excess audit firm capacity affect audit quality is an empirical question. In this study, I test whether local audit offices with strained (excess) capacity have lower (higher) audit quality as measured by both going concern opinion errors and the absolute value of performance-matched discretionary accruals. I also test an alternative hypothesis that strained (excess) capacity will strengthen (weaken) an audit firm's negotiating power resulting in higher (lower) audit quality. I further test whether the effect of strained and excess capacity on audit quality is smaller for local audit offices of the Big 4 and second-tier audit firms due to reputational

concerns and/or their ability to transfer personnel between offices.

III. HYPOTHESIS DEVELOPMENT

Audit Quality

Mandating audit firm rotation has the potential to cause serious fluctuation in the work performed by audit firms. Such fluctuations may leave local audit offices with either too little or too much capacity. When an audit firm has strained capacity, there may be significant audit quality implications. Similar to fee pressure, capacity strain motivates audit firms to complete tasks quickly and efficiently. Efficiency per se should have no effect on audit quality; however, if capacity strain induces less responsiveness to increased risk, then there may be negative audit quality implications. Alternatively, audit firms with strained capacity due to a significant increase in clientele may have more negotiating power due to the reduced need to maintain individual clients (Reynolds and Francis 2000). Greater negotiating power may then result in a greater ability to issue going-concern opinions and compel clients to make adjustments to their financial statements resulting in greater audit quality.

Similar to strained capacity, excess capacity could have positive or negative effects on audit quality. Excess capacity weakens an audit firm's negotiating power and provides an incentive to maintain current clients and fill excess capacity. To do so, local audit offices with excess capacity may relax their audit quality in order to induce potential clients to acquire their services and persuade current clients against switching audit firms. Alternatively, fewer capacity constraints may result in more time to devote to making better judgments. I propose the following non-directional hypothesis stated in null form.

H1: *Companies audited by local audit offices with strained (excess) capacity will have audit quality similar to companies audited by local audit offices without strained (excess) capacity.*

In this study, I use two approaches to measure audit quality. For the first approach, I estimate the likelihood of Type I and Type II going-concern opinion errors.[6] Audit firms use the going concern explanatory paragraph to express their opinion about a client's financial health. Type I errors occur when an audit firm issues a going concern opinion and a client does not subsequently go bankrupt within a year. Type II errors occur when an audit firm does not issue a going-concern opinion and the client subsequently goes bankrupt. Fewer errors of either type are an indication of greater audit quality, although Type II errors are generally considered more severe.

Audit firms have competing incentives regarding issuing going concern opinions that can bias their decisions. On the one hand, audit firms can reduce their risk of litigation by issuing going concern opinions to financially stressed clients (Carcello and Palmrose 1994) whether such an opinion is deemed appropriate or not. In addition, failure to issue a going concern opinion to a client that subsequently goes bankrupt may result in damage to an audit firm's reputation as it is perceived as a signal of low audit quality. On the other hand, clients are more likely to dismiss auditors that issue them a going concern opinion (Krishnan 1994). These competing incentives can be described as a risk-versus-relationship dilemma.

Figure 1 illustrates the relation between an audit firm's decision of whether or not to issue a going concern opinion and audit quality. Type I errors result under one of

[6] I treat Type I and Type II errors separately because the causes and incentives for their occurrence are different. These incentives are discussed in detail below.

two conditions: 1) the audit firm issues a going concern opinion when one was not necessary because of poor judgment or 2) the audit firm does not deem it necessary to issue a going concern opinion, but does so in order to reduce the audit firm's litigation risk. The first condition relates to DeAngelo's (1981a) first component of audit quality, the *failure to detect*. The second condition relates to DeAngelo's (1981a) second component of audit quality, the *failure to report* correctly. Similarly, Type II errors occur either due to an audit firm's failure to detect the need for a going-concern opinion or the failure to report one when it was deemed necessary due to relationship concerns.

[Insert Figure 1 Here]

As a second measure of audit quality, I use a measure of discretionary accruals based on the model derived in Jones (1991) and further modified by Dechow et al. (1995) and Kothari et al. (2005). Discretionary accruals provide a broad measure of audit quality which is not restricted to extremes. In addition, accrual-based measures have been found to be significantly correlated with the occurrence of fraud (Jones et al. 2008).

Audit Firm Size

As previously described, there are two distinct hypotheses which predict that local audit offices of the Big 4 and second-tier audit firms will react less to strained and excess capacity caused by extreme changes in clientele. The first hypothesis is that the Big 4 and second-tier audit firms are able to react to capacity changes by transferring personnel between local offices, a capability that smaller audit firms do not have. The second hypothesis is that national offices of these local offices protect the reputation of the entire audit firm by managing the performance standards and client acceptance

decisions of each local audit office. I propose the following hypothesis stated in alternate form to jointly test these theories.

> ***H2:*** *The effects of strained (excess) capacity on audit quality will be smaller for Big 4 and second-tier audit firms than for other firms.*

Portfolio Management Decisions

In an operational sense, capacity considerations can affect the order in which a business selects the jobs it will perform. Such is the case with "make-to-order" manufacturing firms (Sridharan 1998). Make-to-order manufacturing firms are similar to service firms in that they hold capacity in stock as opposed to inventory. Under strained capacity, make-to-order manufacturing firms must discriminate between different customers, resulting in the rejection of some orders for lower priority products. Likewise, audit firms with strained capacity cannot accept all requests for their services. Capacity strained audit firms may then be extra selective in determining those companies that they will serve. The opposite is true for audit firms with excess capacity.

Bills and Jensen (2011) provide evidence that 1) audit firms prefer to serve higher quality companies and 2) the ability of audit firms to be selective of the clients they serve increases as the demand on audit firm capacity is increased. These results support the hypothesis that the audit market follows a two-sided matching approach known as positive assortative matching (PAM). This approach or model is in contrast to one-sided matching models such as signaling models which have been used to describe how audit clients alone select the audit firm that will perform their audit. Matching decisions are defined by a market with multiple parties where members from each party must make decisions about who they will pair with from another party, such as with

audit firms and potential audit clients. When members from each party have limited pairing capacity (such as audit clients only needing one auditor and audit firms only having the capacity to serve a limited number of clients) and when members from each party can be ranked from most preferred to least preferred based on one or more characteristics, the preferences of *both* parties will drive how pairing will occur. PAM occurs when members from differing parties match on characteristics that both prefer. Under this model, the most preferred partners will be paired first, the second most preferred partners will be paired second, and this matching continues until the pairing capacity of all members of at least one party is used up. For example, Bills and Jensen (2011) provide evidence that audit firms prefer higher quality clients and clients prefer higher quality auditors resulting in higher quality audit firms matching with higher quality companies and lower quality audit firms matching with lower quality companies.

Other than company quality, there are other characteristics for which audit firms have a preference. Prior literature has shown that there are significant differences in the characteristics of clients that are expected to be served by larger audit firms and those expected to be served by smaller audit firms. Shu (2000) introduces a methodology for determining the likelihood a company will be served by a large audit firm and for determining where auditor-client mismatches are present.[7] Results of Shu (2000) indicate that when mismatches occur through changes in the characteristics of audit clients that it increases the likelihood that the audit firm will resign from the audit engagement. These results indicate that mismatches may not be favorable to audit firms.

[7] This likelihood is similar to the "propensity score" discussed by Francis and Lennox (2008) and Lawrence et al. (2011) which can be used to correct for selection bias.

Consistent with the findings from these studies, I expect that auditor-client mismatches are less likely to occur when an audit firm has strained capacity and can be more selective and are more likely to occur when an audit firm has excess capacity and cannot be as selective. Positive assortative matching theory would suggest that, all else equal, the likelihood of mismatches occurring would be lower when audit firm's capacity is strained. Alternatively, when an audit firm has excess capacity, it may be willing to accept clients it would not typically serve. As such, I propose the following testable hypothesis.

> ***H3:*** *Auditor-client mismatches are less (more) likely to occur when an audit firm has strained (excess) capacity.*

Auditor-Client Mismatches

As shown by Shu (2000) and others, characteristics of clients generally served by larger audit firms are different than characteristics of clients generally served by small audit firms. Mismatches exist when large audit firms serve clients expected to be served by small audit firms and vice versa. Mandatory audit firm rotation may increase the rate of auditor-client mismatches, especially where there are few rotation options available. Whether such mismatches have an effect on audit quality is an empirical question.

Prior research has shown that audits provided by larger audit firms result in greater audit quality (e.g. Francis et al. 1999; Nelson et al. 2002; Hammersley et al. 2007). Recently, Lawrence et al. (2011) questions whether these results are robust when a matched sample design is used. Lawrence et al. (2011) match on several different factors including propensity score (the likelihood that a client will be audited by a large

audit firm); however, they match all clients not served by the Big 4 to clients served by the Big 4 and do not identify mismatches or differentiate between the two types of mismatches. I propose the following two testable hypotheses.

> ***H4a:*** *Auditor-client mismatches where clients expected to be served by large audit firms are served by small audit firms have lower audit quality than where no mismatches are present.*
>
> ***H4b:*** *Auditor-client mismatches where clients expected to be served by small audit firms are served by large audit firms have higher audit quality than where no mismatches are present.*

IV. SAMPLE SELECTION AND METHODOLOGY

Sample Selection

Table 1 illustrates the samples used in this study. Audit fee and opinion data are available from the Audit Analytics database beginning in the year 2000. In order to avoid the changing dynamics of the audit industry around the implementation of the Sarbanes-Oxley Act of 2002 and the movement of Arthur Anderson's clients to other auditors, I exclude years 2000 through 2003 and include only the years 2004 through 2009 in my sample. I merge the Audit Analytics data set with the Compustat Industrial Annual database and eliminate observations where Compustat data are unavailable. My initial sample consists ofzz 42,193 client-year observations with Audit Analytics and Compustat data.[8] I correct 526 of these client-year observations which have either the incorrect auditor city or the incorrect auditor in the Audit Analytics database. Errors were found by scanning client-year observations and investigating 10-K's where logical

[8] Where I calculated assets audited in an MSA, I use the full Audit Analytics fee file and do not eliminate observations that are missing Compustat data.

discrepancies were identified.[9] I identify an additional 3,495 client-year observations in the Audit Analytics database which are missing auditor city information and am able to add auditor city information to 3,355 of these observations resulting in a total sample of 45,547 client-year observations.[10] I add to this sample bankruptcy information from the UCLA-LoPucki Bankruptcy Research Database which was kindly provided upon request.

[Insert Table 1 Here]

After calculating my measures of strained and excess capacity (described in detail below), I eliminate years 2004 and 2005 from the sample because two years of prior data are required for the measurements of strained and excess capacity. Because clients in the financial industry (SIC codes 60-69) have different financial statement characteristics than nonfinancial clients, I exclude these from my sample.

Two factors that may undesirably affect the measures of strained and excess capacity are audit firm mergers and audit offices with very little audit work from public companies. Because I measure strained and excess capacity by relative percentage change in assets audited, audit office mergers disrupt this measurement. I hand collected a dataset of audit firm mergers at the local audit office level from multiple sources.[11] I exclude from my sample all observations that were audited by audit offices identified at the local level as having merged with an audit office of another audit firm during the

[9] For example, if Audit Analytics identifies only one audit by an audit firm in a city, I investigate 10-K's to determine whether the auditor city identified by Audit Analytics is incorrect.

[10] I first use logical steps to add auditor city information to 2,311 of these observations. For example, if auditor city information is missing from a firm-year observation and the audit firm performing the company's audit for that year has only one audit office, then I add the city of the one audit office to the observation. I then hand collect auditor city information from 10-K filings for an additional 1,044 observations.

[11] Sources of audit firm mergers include the PCAOB's report on name changes of registered public accounting firms (PCAOB 2010), reports from Compliance Week (Compliance Week 2008, 2009, 2010), and investigation of audit firm changes identified in Audit Analytics through Google searches.

sample period.[12] Also, audit offices in my sample with few public audit clients are disproportionately likely to have significant changes in total assets audited due to their relatively small size which may lead to the measures of strained and excess capacity capturing an audit office size effect. It is doubtful that all the small audit offices that would be indicated as having strained or excess capacity according to the measures used in this study truly have strained or excess capacity. For this reason, I eliminate audit offices that have fewer than three audit clients.

An alternative explanation for a correlation between stained and excess capacity and audit quality is that those audit firms identified as having strained capacity are also likely to have a larger proportion of initial year audits. Prior research has shown that initial year audit engagements have greater amounts of discretionary accruals (Myers et al. 2003) and greater amounts of going-concern errors (Geiger and Raghunandan 2002). In order to control for this possible explanation, I eliminate all initial year audits from my GCO and DC samples and include only continuing audit engagements.[13] Finally, I limit my sample to those clients that are financially distressed (described in detail below), resulting in a final sample of 8,845 client-years that I use to test H1 and H2 using going-concern opinions (GCO sample).

Table 1 further illustrates how I reach my final samples for testing H1 and H2 using discretionary accruals (DA sample) and each of the remaining hypotheses. All continuous variables in each sample are winsorized at their 1% extremes.

[12] I do not exclude only merger years and the years just prior and after the merger years because the exact dates of the mergers and detail about their implementation were largely unavailable.
[13] Untabulated results are similar if initial year audits are not eliminated.

Methodology

Audit Quality

My first set of hypotheses relates to the impact of excess and strained local audit office capacity on audit quality. As described previously, I use the likelihood of a Type I and Type II going concern opinion error as an initial measure of audit quality. I restrict my sample to financially distressed companies where financial distress is defined as having one of the following: 1) negative operating cash flows (Compustat variable OANCF), 2) a net loss (Compustat variable NI), 3) negative retained earnings (Compustat variable RE) in the current or previous two years, or 4) negative working capital (Compustat variable WCAP) in the current or previous two years (Hopwood et al. 1994). Similar to Knechel and Vanstraelen (2007), I estimate the following model under two specifications with the dependent variables being either Type I or Type II errors.

$$ERROR_{it} = \mu_0 + \mu_1 STRAIN_{ft} + \mu_2 EXCESS_{ft} + \mu_3 LTA_{it} + \mu_4 Z_{it} + \mu_5 \Delta Z_{it} + \mu_6 AFEES_{it} + \mu_7 NFEES_{it} + \mu_8 GDP_{it} + \mu_9 \Delta GDP_{it} + \mu_{10} DECYE_{it} + \mu_j Year_{it} + \mu_k Industry_{it} + \varepsilon_{it} \quad (1)$$

where,

$ERROR_{it}$ = 1 if a Type I error occurred, 0 otherwise;

= 1 if a Type II error occurred, 0 otherwise;

$STRAIN_{ft}$ = 1 if company i's auditor is in the top decile of audit firms having a percentage increase in metropolitan statistical area (MSA) total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise; [14,15]

[14] Geographic cities are classified by MSA using the U.S. Census Bureau's MSA cross-map that can be found at http://www.census.gov/geo/www/maps/msa_maps2008/msa2008_previews_html/cbsa_us_wall_1108.html.

$EXCESS_{ft}$ = 1 if company i's auditor is in the bottom decile of audit firms having a percentage decrease in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;

LTA_{it} = log of company i's year end total assets;

Z_{it} = Altman's (2000) z-score for nonmanufacturing firms ranked from 0 to 9 by two-digit SIC code where Z-score= 6.56 (X1) + 3.26 (X2) + 6.72 (X3) + 1.05 (X4), where X1 is working capital divided by total assets, X2 is retained earnings divided by total assets, X3 is earnings before interest and taxes (EBIT) divided by total assets, and X4 is market value of equity divided by book value of total liabilities.

ΔZ_{it} = change in a company's Altman's Z-score from t-1 to t;

$AFEES_{it}$ = log of total audit fees paid by company i for a first year audit engagement;

$NFEES_{it}$ = log of total nonaudit fees plus one;

GDP_{it} = yearly GDP per capita per local audit office's MSA;

ΔGDP_{it} = change in yearly GDP per capita per local audit office's MSA;

$DECYE_{it}$ = 1 if the company has a December fiscal year end, zero otherwise;

$Year_t$ = year dummy variables;

$Industry_k$ = industry dummy variables by two-digit SIC code;

The variables of interest are STRAIN and EXCESS. H1 predicts either a positive or negative coefficient on these variables. Control variables are similar to those

[15] Local audit office capacity could have been modeled as a single continuous variable or a variable having a value of 1, 0, or -1 if the local audit office had strained, normal, or excess capacity, respectively; however, doing so would assume a symmetric effect for both strained and excess capacity. The approach used to measure excess and strained capacity in my study was chosen because it allows more information about the effects to be shown.

in Knechel and Vanstraelen (2007). Client total assets (LTA) are included to control for size effects. Z and ΔZ are included to control for each client's level of and change in bankruptcy risk. Local economic conditions are controlled for by including yearly gross domestic product by population (GDP) and change in GDP (ΔGDP) in the auditor's MSA.[16] Finally, whether the company has a December fiscal year end (DECYE) is included in the model in order to control for the effect peak period may have on local audit office's capacity.

As a second test of H1, I use a measure of discretionary accruals as a proxy for audit quality. To estimate discretionary accruals, I employ the modified Jones model (Dechow et al. 1995):

$$\frac{\mathrm{ACC_{i,t}}}{\mathrm{ATA_{i,t}}} = \propto_1 + \propto_2 \frac{(\Delta \mathrm{REV_{i,t}} - \Delta \mathrm{REC_{i,t}})}{\mathrm{ATA_{i,t}}} + \propto_3 \frac{\mathrm{PPE_{i,t}}}{\mathrm{ATA_{i,t}}} + \varepsilon_{i,t} \quad (2)$$

I further modify this model by matching each firm-year observation with another observation from the same two-digit SIC code and year with the closest return on assets as in Kothari et al. (2005).[17] Reynolds and Francis (2000) express that in the absence of a prediction about the direction of accrual manipulation that unsigned accruals should be used. The magnitude of unsigned accruals captures a company's success in managing earnings either up or down (Healy 1985; DeFond and Park 1997). I therefore use the absolute value of performance-matched discretionary accruals and estimate the following model which includes variables shown to be correlated with discretionary accruals:

$$\mathrm{ABSPDA_{it}} = \beta_0 + \beta_1 \mathrm{STRAIN_{ft}} + \beta_2 \mathrm{EXCESS_{ft}} + \beta_3 \mathrm{LTA_{it}} + \beta_4 \mathrm{CFO_{it}} + \beta_5 \mathrm{LEV_{it}} \quad (3)$$

[16] Historical data on gross domestic product by population for U.S. MSA's was obtained from the U.S. Bureau of Economic Analysis's web page.

[17] Results of this study are robust to the use of the absolute value of Dechow et al.'s (1995) modified Jones model (nonperformance adjusted).

$$+ \beta_6 MKTBK_{it} + \beta_7 DECYE_{it} + \beta_j Year_t + \varepsilon_{it}$$

where,

$ABSPDA_{it}$ = absolute value of performance matched discretionary accruals,

CFO_{it} = operating cash flows divided by lagged total assets,

LEV_{it} = total long-term debt caled by total assets,

$MKTBK_{it}$ = market value of equity divided by book value of equity at year end.

and all other variables are as previously defined.

The variables of interest are STRAIN and EXCESS. H1 predicts that β_1 (β_2) will be positive if strained (excess) capacity results in lower audit quality or negative if strained (excess) capacity results in greater audit quality. Client size (LTA) and cash flow from operations (CFO) are included in the model as in Becker et al. (1998). Leverage (LEV) is included as companies with greater levels of debt have a greater incentive to manipulate earnings (Reynolds and Francis 2000). Market-to-book ratio (MKTBK) is included as a measure of company growth as companies that are growing rapidly may have a greater incentive to manage accruals to maintain the appearance of growth. Finally, whether the company has a December fiscal year end (DECYE) is included in the model in order to control for the effect that audit timing has on local audit office's capacity.

Audit Firm Size

To test H2, I add to models 1 and 3 an indicator variable, LGAUDITOR, which

is equal to one if a client is audited by a Big 4 or second tier auditor, zero otherwise.[18] I further interact each variable of interest (STRAIN and EXCESS) and each control variable with LGAUDITOR and add the interactions to the model as follow:

$$ERROR_{it} = \mu_0 + \mu_1 STRAIN_{ft} + \mu_2 EXCESS_{ft} + \mu_3 LGAUDITOR_t + \mu_4 STRAINLG_{ft} + \mu_5 EXCESSLG_{ft} + \mu_6 LTA_{it} + \mu_7 Z_{it} + \mu_8 \Delta Z_{it} + \mu_9 AFEES_{it} + \mu_{10} NFEES_{it} + \mu_{11} GDP_{it} + \mu_{12} \Delta GDP_{it} + \mu_{13} DECYE_{it} + \mu_{14} LTALG_{it} + \mu_{15} ZLG_{it} + \mu_{16} \Delta ZLG_{it} + \mu_{17} AFEESLG_{it} + \mu_{18} NFEESLG_{it} + \mu_{19} GDPLG_{it} + \mu_{20} \Delta GDPLG_{it} + \mu_j Year_{it} + \mu_k Industry_{it} + \varepsilon_{it} \quad (4)$$

$$ABSPDA_{it} = \beta_0 + \beta_1 STRAIN_{ft} + \beta_2 EXCESS_{ft} + \beta_3 LGAUDITOR_f + \beta_4 STRAINLG_{ft} + \beta_5 EXCESSLG_{ft} + \beta_6 LTA_{it} + \beta_7 CFO_{it} + \beta_8 LEV_{it} + \beta_9 MKTBK_{it} + \beta_{10} DECYE_{it} + \beta_{11} LTALG_{it} + \beta_{12} CFOLG_{it} + \beta_{13} LEVLG_{it} + \beta_{14} MKTBKLG_{it} + \beta_j Year_t + \varepsilon_{it} \quad (5)$$

where,

$LGAUDITOR_i$ = 1 if company i is audited by a Big 4 or second-tier auditor, 0 otherwise;

I then test the significance of the coefficients on the interaction terms STRAINLG and EXCESSLG to determine if the effects of strained and excess capacity in each of the models are significantly smaller for those companies audited by the Big 4 and second-tier audit firms.

Portfolio Management Decisions

In order to test H3, I define mismatches using the methodology described in Shu (2000). First, I estimate the following logit model separately for each year on the full sample of client-year observations.

[18] As a robustness check, I estimate the model under two alternative specifications using an indicator variable for Big 4 only or indicator variables for each large audit firm separately. Results are robust to these alternative specifications.

$$LGAUDITOR_i = \rho_0 + \rho_1 LTA_{it} + \rho_2 ACQUISITION_{it} + \rho_3 \Delta FINANCING_{it} + \rho_4 PROFITABILITY_{it} + \rho_5 MKTBK_{it} + \varepsilon_{it} \quad (6)$$

where,

$ACQUISITION_{it}$ = acquisitions per the cash flow statement divided by average total assets;

$FINANCING_{it}$ = total debt and stock issuances from the cash flow statement divided by average total assets;

$PROFITABILITY_{it}$ = income before extraordinary items divided by average total assets;

$MKTBK_{it}$ = market value of equity scaled by book value of common equity.

I then multiply the respective yearly estimated coefficients by the actual values from each observation. As in Shu (2000), I use these estimations to determine the optimal yearly cutoffs that minimize the two types of misclassification rates (expected to be audited by a large audit firm when it is not and expected to not be audited by a large audit firm when it is). [19] I use the estimates from each observation and the cutoff to determine whether an observation is expected to be audited by a large audit firm or not. I then create the variable MISMATCH1 which is equal to one if a client is audited by a small audit firm when it is expected to be audited by a large audit firm, zero otherwise, and MISMATCH2 which is equal to one if a client is audited by a large audit firm when it is expected to be audited by a small audit firm, zero otherwise. I restrict the sample to those observations that are first year audit engagements and estimate the following logit model.

[19] Cutoffs were as follows: .55 in 2004, .55 in 2005, .53 in 2006, .55 in 2007, .57 in 2008, and .62 in 2009.

$$MISMATCH(1 \text{ or } 2)_{ft} = \sigma_0 + \sigma_1 STRAIN_{ft} + \sigma_2 EXCESS_{ft} + \sigma_3 AFEES_{it} + \sigma_4 NFEES_{it} \quad (7)$$
$$+ \sigma_5 GDP_{it} + \sigma_6 \Delta GDP_{it} + \sigma_7 HERF_{mt} + \sigma_8 DECYE_{ft} + \sigma_k Year_t + \sigma_k Industry_t + \varepsilon_{it}$$

where,

$MISMATCH1_{ft}$ = 1 if a client is audited by a small audit firm when it is expected to be audited by a large audit firm, zero otherwise;

$MISMATCH2_{ft}$ = 1 if a client is audited by a large audit firm when it is expected to be audited by a small audit firm, zero otherwise;

$HERF_{mt}$ = the industry Herfindahl index calculated as the sum of squared industry market shares (in audit fees) of all local audit offices in an MSA (m);

and all other variables as previously defined.

I control for audit fees (AFEES) and nonaudit fees (NFEES) paid to the auditor as a large audit firm may be willing to serve a company it would not typically serve if the fees are high enough. I also control for city level economic conditions (GDP and ΔGDP) that may affect an audit firm's willingness to serve a client as well as local audit firm concentration (HERF) and fiscal year end (DECYE) as concentration and audit timing may affect the auditor-client matching decision. H3 predicts that σ_1 will be negative, while H3 predicts that σ_2 will be positive.

Mismatch Effect on Audit Quality

H4a predicts that auditor-client mismatches where clients typically served by large audit firms are served by small audit firms will result in lower audit quality. Similarly, H4b predicts that mismatches where clients typically served by small audit firms are served by large audit firms will result in higher audit quality. I test these

hypotheses using tests of differences in means and the following multiple regression model:

$$ABSPDA_{it} = \lambda_0 + \lambda_1 MISMATCH1_{ft} + \lambda_2 MISMATCH2_{ft} + \lambda_3 LTA_{it} + \lambda_4 CFO_{it} + \lambda_5 LEV_{it} + \lambda_6 MKTBK_{it} + \lambda_7 DECYE_{it} + \lambda_j Year_t + \varepsilon_{it} \quad (8)$$

where all variables are as previously described.

H4a predicts that λ_1 will be positive and H4b predicts that λ_2 will be negative. Additional variables are included in the model which have been shown in prior literature to influence discretionary accruals as previously described. In response to Lawrence et al.'s (2011) suggestion to use matched samples when testing audit quality difference between audits performed by Big 4 and non-Big 4 audit firms, I estimate the model after matching mismatches with non-mismatches with the closest propensity score estimated using Model 6.

V. RESULTS

Table 1 and Table 2 present descriptive statistics and correlations for both the GCO and DA samples used to test H1 and H2. The GCO sample contains 8,845 client-year observations of which 7,443 (84.1 percent) are audited by the Big 4 or second-tier audit firms, 615 (7 percent) are identified as being audited by audit firms with strained capacity, and 266 (3 percent) are identified as being audited by audit firms with excess capacity. The GCO sample includes 264 bankruptcies. The industries with the greatest number of bankruptcies represented in the sample are the computer equipment and services industry (SIC codes 35 and 73) with 46, the chemicals and allied products industry (SIC code 28) with 33, and the electronics equipment industry (SIC code 36) with 26 client-year observations. In the GCO sample, there are 724 identified Type I

errors (343 by Big 4 and second tier auditors) and 143 Type II errors (110 by Big 4 and second tier auditors).

[Insert Tables 2 and 3 Here]

Results of the first test of H1 and H2 are illustrated in Table 4. Column 1 and Column 2 in Table 4 show logistic estimations of Model 1 under two specifications with the dependent variable TYPEII. The coefficients on STRAIN and EXCESS in these two estimates are insignificant at conventional levels as are the coefficients on the interaction terms STRAINLG and EXCESSLG. Client size (LTA) is negatively correlated with the occurrence of Type II errors and Altman's z-score (Z) is positively correlated with the occurrence of Type II errors as expected.

[Insert Table 4 Here]

The dependent variable in columns 3 and 4 in Table 4 is TYPEI. The coefficient on STRAIN in the full sample is positive and significant at the .10 level and the coefficients on EXCESS are insignificant at conventional levels. These results indicate that clients served by audit firms with strained capacity are more likely to have Type I going-concern opinion errors consistent with the hypothesis that strained capacity results in lower audit quality. The interaction terms STRAINLG and EXCESSLG are insignificantly correlated with Type I errors inconsistent with H2.

As a second test of H1 and H2, I use a measure of discretionary accruals calculated using the modified Jones model as described by Dechow et al. (1995) adjusted for performance as described by Kothari et al. (2005). There are 8,845 observations in the DA sample. Table 5 illustrates the results of this test. The coefficient estimates on STRAIN and EXCESS are both positive and significant at the .01 level

indicating that clients served by audit firms with strained or excess capacity have lower audit quality as measured by discretionary accruals. The coefficient on the interaction term STRAINLG is negative and significant at the .01 level consistent with the negative consequences of strained capacity being lower for local offices of the Big 4 and second-tier audit firms. The coeffeicient on the interaction term EXCESSLG is negative, but insignificant.

[Insert Table 5 Here]

Table 6 presents descriptive data and correlations for the sample used to test H3. The sample includes 1,276 first year audit observation with 83 (6.5 percent) mismatches where clients expected to be served by large audit firms are served by smaller audit firms (MISMATCH1) and 112 (8.8 percent) mismatches where clients expected to be served by small audit firms are served by large audit firms (MISMATCH2). The sample also includes 94 (7.4 percent) clients served by auditors with strained capacity and 32 (2.5 percent) clients served by auditors with excess capacity.

[Insert Table 6 Here]

Results of the estimation of Model 7 are shown in Table 7. The dependent variable in column 1 is MISMATCH1. The coefficient on EXCESS is insignificantly different from zero. The coefficient on STRAIN is positive and significant indicating that strained audit firm capacity does not dissuade small audit firms from accepting new clients that are typically served by larger audit firms. A possible explanation for this unexpected result is that all mismatches are not less preferred by audit firms. Shu (2000) and Landsman et al. (2009) do not differentiate between the two distinct types of mismatches. Anecdotal evidence suggests that small audit firms may desire to pick up

clients typically served by the Big 4 or second tier audit firms any time they can because serving such clients helps smaller firms establish credibility.

Column 2 shows estimation of Model 7 with MISMATCH2 as the dependent variable. The coefficient on STRAIN is negative and significant supporting H3 that mismatches are less likely when an audit firm has strained capacity. Again, the coefficient on EXCESS is insignificantly different from zero. Audit fees are negatively correlated with MISMATCH1 and MISMATCH2 indicating that mismatches may result in lower audit fees.

[Insert Table 7 Here]

Table 8 shows descriptive statistics and correlation tables related to the full sample and matched sample used to test H4. The full sample includes 21,693 firm-year observations from 2004 through 2009 with 1,604 (7.4 percent) mismatches where clients typically served by large audit firms are served by smaller audit firms (MISMATCH1) and 1,576 (7.3 percent) mismatches where clients typically served by small audit firms are served by large audit firms (MISMATCH2). The matched sample has 6,360 observations with 3,180 mismatches and 3,180 nonmismatches.

[Insert Tables 7 and 8 Here]

Table 9 Column 1 presents the two-sample test of means between those company-year observations in the unmatched sample with MISMATCH1 and MISMATCH2 and those company-year observations with no mismatches. Test statistics indicate that both the MISMATCH1 and MISMATCH2 samples have mean absolute values of performance-matched discretionary accruals lower than those company-year observations with no mismatches, providing evidence that rather than impairing audit

quality, mismatches may actually result in greater audit quality. The estimation of Model 8 with the full sample in Column 2 provides similar results where the coefficient on MISMATCH2 is negative and significant at the.01 levels, however, the coefficient on MISMATCH1 is insignificant. Utilizing the matched sample design, the coefficient MISMATCH2 remains negative and significant; however, the coefficient on MISMATCH1 becomes positive and significant at the .01 level. The change in sign supports the importance in controlling for differences in client characteristics described by Francis and Lennox (2008) and Lawrence et al. (2011). In summary, the results support H4a and H4b that when large audit firms perform the audit of clients typically served by smaller audit firms it is correlated with greater audit quality. However, when smaller audit firms perform the audits of clients typically served by large audit firms it is correlated with lower audit quality, at least in the matched sample design.

Additional Robustness Checks, Additional Analyses, and Limitations

As alternative measures of Type I and Type II going-concern errors, I expand the window over which I measure both from one-year subsequent to the opinion date to two and three years subsequent to the opinion date. Under each of these additional specifications results are similar to those previously reported. Type II going-concern errors remain uncorrelated with STRAIN and EXCESS. Additionally, I redefine Type I (Type II) going-concern errors as occurring if a company received a going concern opinion and did not (did) subsequently go bankrupt, merge with another company, or become delisted or liquidated. Results are again similar to those previously reported.

Next, I evaluate the effect of strained and excess audit office capacity on audit quality on clients with December and non-December year ends. Results of Model 5

estimated on these two samples are shown in Table 10. These results show that the effect of strained and excess capacity on audit quality are significant for December year end clients, but not for non-December year end clients. However, in an untabulated estimation the difference between the effects of strained and excess capacity on the absolute value of performance matched discretionary accruals in the two samples is insignificantly different from zero. This lack of significance may be due to a lack of power in the smaller samples.

[Insert Table 10 Here]

As in all archival studies, this study has its limitations. Ideally, information related to the audit of private companies would be available in addition to the public company information that was used. This same limitation applies to extant literature on auditor industry specialization and auditor concentration. However, to a large extent the experience and skills needed to perform audits of public companies is differentiable from those needed to perform audits of private companies, especially for higher seniority positions. Additionally, significant effort was made in this study to use as much information as could be obtained through collecting auditor city information that was absent in Audit Analytics.

Additionally, information related to audit hours and number of employees in a local audit office would be ideal for determining periods of strained or excess capacity; however, such information is not made available by audit firms. That being said, identifying local audit offices that are more likely to have strained or excess capacity by extreme changes in clientele fits well in the context of the questions being addressed in this study as mandatory audit firm rotation would result in swings in auditor clientele.

VI. CONCLUSIONS

As regulators weigh the costs and benefits of mandating audit firm rotation, they should consider the impact such regulation would have on audit firms' capacity at the local office level and on auditor-client alignments. While this study does not directly test the effects of a transition into mandatory audit firm rotation in the US market, it does test how possible consequences of mandating audit firm rotation may affect audit quality. Two potential consequences of mandatory audit firm rotation are 1) it increases the volatility of local audit offices' client portfolios and increases the likelihood of local audit offices having periods of strained or excess capacity, and 2) it increases the likelihood of auditor-client mismatches occurring, especially in locations/industries where there are few rotation opportunities available.

In this study, I investigate the effects of strained and excess audit firm capacity at the local level on audit quality and whether such effects are contingent upon the size and structure of the audit firm. I provide evidence that audit quality is negatively affected by both strained and excess audit firm capacity. Further, I find evidence that the negative effect of strained capacity on audit quality is smaller for the Big 4 and second tier audit firms, supporting the flexibility and reputation hypotheses.

I further investigate the effect of strained and excess capacity on an audit firm's client acceptance decisions. I find that mismatches, where a large audit firm accepts a client expected to be served by a small audit firm, are less likely to occur when a large audit firm has strained capacity. Unexpectedly, I find that mismatches, where a small audit firm accepts a client expected to be served by a large audit firms, are more likely to occur when a small audit firm has strained capacity. This result may indicate the

desire of smaller audit firms to win clients from larger firms. I find no correlation between excess capacity and auditor-client mismatches.

Finally, I investigate the effect of auditor-client mismatches on audit quality. I find that audit quality is positively affected when a large audit firm performs the audit for a company expected to be served by a smaller audit firm and is negatively affected when a small audit firm performs the audit for a company expected to be served by a larger audit firm.

This study bridges the auditing and operations management literatures while addressing an area of concern for regulators. In this study, I consider audit firms as other service businesses which face operating challenges such as that of managing capacity levels. I believe that more research is needed in this area. Future research should look at other managerial and operational characteristics of auditing firms and their implications for important audit topics including audit quality, concentration, specialization, and portfolio management. This research will be especially beneficial in the context of regulation that has the potential to effect audit firms' operational decisions.

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APENDIX A
Tables and Figures

TABLE 1
Sample Selection

Panel A: Going-Concern Sample Selection

Observations	
Merged Audit Analytics and Compustat Client-Year observations from January 01, 2004 to December 31, 2009 where Compustat data are available	42,129
Plus: Added auditor city information	3,355
Less: Observations from 2004 and 2005 for STRAIN and EXCESS measures	(15,877)
Less: Observations in financial industries	(10,101)
Less: Observations with local audit offices which merged during the sample period	(4,463)
Less: Observations with fewer than three public clients in an MSA	(821)
Less: Initial year audits	(781)
Less: Observations that are not financially distressed	(4,596)
Going-concern opinion sample	**8,845**

Panel B: Discretionary Accruals Sample Selection

Merged Audit Analytics and Compustat Client-Year observations from January 01, 2004 to December 31, 2009 where Compustat data are available	46,429
Plus: Added auditor city information	3,355
Less: Observations in industries with fewer than 20 observations	(11,256)
Less: Observations in financial industries	(16,835)
Discretionary accruals sample for testing Hypothesis 4	**21,693**
Less: Observations from 2004 and 2005 for STRAIN and EXCESS measures	(7,229)
Less: Observations with audit firms which merged during the sample period	(2,207)
Less: Observations with fewer than three clients in an MSA	(406)
Less: Initial year audits	(896)
Discretionary accruals sample for testing Hypotheses 1 and 2	**10,955**
Add back: Initial year audits	896
Plus: Observations where Compustat is available due to different model variables	380
Less: Non-intitial year audits	(10,955)
Initial audit sample for testing Hypothesis 3	**1,276**

TABLE 2
Descriptive Data – GCO and DA Samples

Panel A - GCO Sample (N= 8,845)

	Mean	Std Dev	First Quartile	Median	Third Quartile
TYPE1	0.082	0.274	0.000	0.000	0.000
TYPE2	0.016	0.126	0.000	0.000	0.000
STRAIN	0.070	0.254	0.000	0.000	0.000
EXCESS	0.030	0.171	0.000	0.000	0.000
STRAINLG	0.031	0.172	0.000	0.000	0.000
EXCESSLG	0.022	0.145	0.000	0.000	0.000
LGAUDITOR	0.841	0.365	1.000	1.000	1.000
LTA	5.594	2.283	3.971	5.545	7.174
Z	-8.458	21.694	-7.490	-1.215	0.474
ΔZ	-0.520	12.628	-1.556	-0.132	0.684
AFEES	13.486	1.282	12.660	13.563	14.322
NFEES	9.697	4.433	9.321	11.106	12.433
GDP	10.907	0.196	10.778	10.905	11.007
ΔGDP	-0.002	0.031	-0.025	-0.001	0.016
DECYE	0.734	0.442	0.000	1.000	1.000

Panel B - DA Sample (N= 10,955)

	Mean	Std Dev	First Quartile	Median	Third Quartile
ABSPDA	0.081	0.107	0.019	0.045	0.098
STRAIN	0.069	0.253	0.000	0.000	0.000
EXCESS	0.031	0.172	0.000	0.000	0.000
STRAINLG	0.037	0.188	0.000	0.000	0.000
EXCESSLG	0.025	0.155	0.000	0.000	0.000
LGAUDITOR	0.874	0.332	1.000	1.000	1.000
LTA	5.914	2.170	4.427	5.949	7.439
CFO	0.031	0.244	0.004	0.082	0.148
LEV	0.181	0.229	0.000	0.104	0.282
MKTBK	2.753	5.264	1.107	1.937	3.421
DECYE	0.684	0.465	0.000	1.000	1.000

Type I = 1 if a Type I error occurred, 0 otherwise;
Type II = 1 if a Type II error occurred, 0 otherwise;
STRAIN = 1 if company i's auditor is in the top decile of audit firms having a percentage increase in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
EXCESS = 1 if company i's auditor is in the bottom decile of audit firms having a percentage decrease in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
STRAINLG = the interaction between STRAIN and LGAUDITOR;
EXCESSLG = the interaction between EXCESS and LGAUDITOR;
LGAUDITOR = 1 if company i is audited by a Big 4 or second-tier auditor, 0 otherwise;
LTA = log of company i's year end total assets;
Z = Altman's (2000) z-score for nonmanufacturing firms ranked from 0 to 9 by two-digit SIC code;
ΔZ = change in a company's Altman's Z-score from t-1 to t;
AFEES = log of total audit fees paid by company i for a first year audit engagement;
NFEES = log of total nonaudit fees plus one;
GDP = yearly GDP per capita per local audit office's MSA;
ΔGDP = change in yearly GDP per capita per local audit office's MSA;
ABSPDA = the absolute value of discretionary accruals based on the model derived in Jones (1991) and further modified by Dechow et al. (1995) and Kothari et al. (2005);
CFO = operating cash flows at time t divided by lagged total assets,
LEV = total debt at time t divided by lagged total assets,
MKTBK = market value of equity divided by book value of equity at year end;
DECYE = 1 if company has a December year end, 0 otherwise.

TABLE 3
Correlation Tables – GCO and DA Samples

Panel A -GCO Sample (N= 8,845)

	TYPEI	TYPEII	STRAIN	EXCESS	STRAINLG	EXCESSLG	LGAUDITOR	LTA	Z	ΔZ	AFEES	NFEES	GDP	ΔGDP	DECYE
TYPE1	1.000														
TYPE2	-0.038***	1.000													
STRAIN	0.100***	0.002	1.000												
EXCESS	0.005	0.015	-0.016	1.000											
STRAINLG	-0.017	-0.001	0.550***	-0.009	1.000										
EXCESSLG	-0.023**	0.014	-0.012	0.782***	-0.007	1.000									
LGAUDITOR	-0.301***	-0.025**	-0.237***	-0.061***	0.039***	0.033***	1.000								
LTA	-0.352***	-0.051***	-0.161***	-0.043***	-0.034***	0.019*	0.513***	1.000							
Z	-0.392***	-0.005	-0.050***	-0.029***	0.003	0.009	0.247***	0.383***	1.000						
ΔZ	0.053***	-0.004	0.053***	-0.003	-0.002	-0.002	-0.062***	-0.036***	0.016	1.000					
AFEES	-0.290***	-0.038***	-0.194***	-0.061***	-0.044***	0.008	0.591***	0.854***	0.284***	-0.050***	1.000				
NFEES	-0.180***	-0.011	-0.114***	-0.037***	-0.032***	-0.013	0.260***	0.429***	0.177***	-0.029***	0.445***	1.000			
GDP	-0.018*	0.008	-0.045***	-0.063***	-0.021**	-0.063***	0.048***	-0.037***	-0.038***	-0.002	0.087***	-0.028***	1.000		
ΔGDP	0.011	0.015	-0.011	-0.022**	-0.001	-0.030***	-0.038***	-0.089***	-0.025**	0.012	-0.048***	-0.024**	0.313***	1.000	
DECYE	0.010	-0.020*	-0.020*	-0.018*	-0.013	0.002	0.064***	0.128***	-0.008	0.009	0.095***	0.010	-0.044***	-0.006	1.000

Panel B - DA Sample (N=10,958)

	ABSPDA	STRAIN	EXCESS	STRAINLG	EXCESSLG	LGAUDITOR	LTA	CFO	LEV	MKTBK	DECYE
ABSPDA	1.000										
STRAIN	0.100***	1.000									
EXCESS	0.030***	-0.014	1.000								
STRAINLG	-0.001	0.603***	-0.008	1.000							
EXCESSLG	-0.010	-0.011	0.836***	-0.007	1.000						
LGAUDITOR	-0.309***	-0.218***	-0.049***	0.033***	0.030***	1.000					
LTA	-0.378***	-0.149***	-0.034***	-0.030***	0.015	0.489***	1.000				
CFO	-0.373***	-0.071***	-0.023**	-0.006	0.013	0.266***	0.448***	1.000			
LEV	-0.014	-0.020**	0.004	-0.009	0.022**	0.088***	0.231***	-0.018*	1.000		
MKTBK	0.060***	0.007	-0.02**	-0.005	-0.014	-0.019**	-0.035***	-0.013	-0.096***	1.000	
DECYE	0.024**	0.001	-0.003	0.004	0.009	0.023**	0.072***	-0.055***	0.120***	0.002	1.000

*,**,*** Pearson correlations are significant at the .10, .05, and .01 level, respectively.

Type I = 1 if a Type I error occurred, 0 otherwise;
Type II = 1 if a Type II error occurred, 0 otherwise;
STRAIN = 1 if company i's auditor is in the top decile of audit firms having a percentage increase in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
EXCESS = 1 if company i's auditor is in the bottom decile of audit firms having a percentage decrease in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
STRAINLG = the interaction between STRAIN and LGAUDITOR;
EXCESSLG = the interaction between EXCESS and LGAUDITOR;
LGAUDITOR = 1 if company i is audited by a Big 4 or second-tier auditor, 0 otherwise;
LTA = log of company i's year end total assets;
Z = Altman's (2000) z-score for nonmanufacturing firms ranked from 0 to 9 by two-digit SIC code;
ΔZ = change in a company's Altman's Z-score from t-1 to t;
AFEES = log of total audit fees paid by company i for a first year audit engagement;
NFEES = log of total nonaudit fees plus one;
GDP = yearly GDP per capita per local audit office's MSA;
ΔGDP = change in yearly GDP per capita per local audit office's MSA;
ABSPDA = absolute value of discretionary accruals based on the model derived in Jones (1991) and further modified by Dechow et al. (1995) and Kothari et al. (2005);
CFO = operating cash flows divided by lagged total assets,
LEV = total long-term debt scaled by total assets,
MKTBK = market value of equity divided by book value of equity at year end.
DECYE = 1 if company has a December year end, 0 otherwise.

TABLE 4
Results of Going-Concern Opinion Error Test

		Type II[a]		Type I[a]	
	Sign	1	2[b]	3	4[b]
Constant		-4.876	-5.798	3.735	5.223
		(0.82)	(1.12)	(1.48)	(1.26)
STRAIN	+/-	-0.321	-0.429	0.395	0.296
		(0.88)	(0.85)	(7.86***)	(2.99*)
EXCESS	+/-	0.107	0.234	-0.226	-0.129
		(0.05)	(0.10)	(0.85)	(0.17)
STRAINLG	+/-		0.306		-0.227
			(0.19)		(0.42)
EXCESSLG	+/-		-0.104		-0.602
			(0.01)		(1.11)
LGAUDITOR	-		-0.102		-7.518
			(0.13)		(1.65)
LTA	-	-0.298	-0.314	-0.768	-0.801
		(11.65***)	(11.62***)	(185.77***)	(69.72***)
Z	-	0.010	0.010	-0.021	-0.020
		(3.55*)	(3.64*)	(119.45***)	(62.11***)
ΔZ	-	-0.014	0.010	0.008	-0.020
		(2.60)	(2.53)	(11.13***)	(23.33***)
AFEES	+	0.101	0.122	0.368	0.430
		(0.53)	(0.62)	(20.23***)	(9.42***)
NFEES	+	0.018	0.017	-0.021	-0.036
		(0.68)	(0.60)	(3.99**)	(4.81**)
GDP		0.069	0.129	-0.021	-0.709
		(0.02)	(0.06)	(3.73*)	(2.75*)
ΔGDP		-0.611	-0.132	4.512	3.161
		(0.02)	(0.00)	(2.66)	(0.78)
DECYE	+	-0.197	-0.142	0.188	0.173
		(1.17)	(0.58)	(2.83*)	(2.31)
Likelihood Ratio		52.36	80.24	1,657.94	1,748.00
p value		<0.001***	<0.001***	<0.001***	<0.001***
N		8,845	8,845	8,845	8,845

*,**,*** Chi-square statistics are significant at the .10, .05, and .01 level, respectively using two-tailed tests.
a- Year and industry dummy variable coefficients are excluded from the table to conserve space.
b- Interaction terms between LGAUDITOR and control variables are excluded to conserve space.

Type I = 1 if a Type I error occurred, 0 otherwise;
Type II = 1 if a Type II error occurred, 0 otherwise;
STRAIN = 1 if company i's auditor is in the top decile of audit firms having a percentage increase in MSA total assets audited from year t-2 to year t-1 calculated yearly calculated yearly, 0 otherwise;
EXCESS = 1 if company i's auditor is in the bottom decile of audit firms having a percentage decrease in MSA total assets audited from year t-2 to year t-1 calculated yearly calculated yearly, 0 otherwise;
STRAINLG = the interaction between STRAIN and LGAUDITOR;
EXCESSLG = the interaction between EXCESS and LGAUDITOR;
LGAUDITOR = 1 if company i is audited by a Big 4 or second-tier auditor, 0 otherwise;
LTA = log of company i's year end total assets;
Z = Altman's (2000) z-score for nonmanufacturing firms ranked from 0 to 9 by two-digit SIC code;
ΔZ = change in a company's Altman's Z-score from t-1 to t;
AFEES = log of total audit fees paid by company i for a first year audit engagement;
NFEES = log of total nonaudit fees plus one;
GDP = yearly GDP per capita per local audit office's MSA;
ΔGDP = change in yearly GDP per capita per local audit office's MSA;
DECYE = 1 if company has a December year end, 0 otherwise.

TABLE 5
Results of Discretionary Accruals Test

		ABSPDA[a]		
	Sign	1	2	3[b]
Constant		0.077	0.148	0.189
		(71.92***)	(41.89***)	(24.00***)
STRAIN	+/-	0.052	0.021	0.023
		(13.02***)	(5.82***)	(4.03***)
EXCESS	+/-	0.033	0.019	0.031
		(5.60***)	(3.49***)	(2.58**)
STRAINLG	+/-			-0.024
				(3.20***)
EXCESSLG	+/-			-0.022
				(1.63)
LGAUDITOR	-			-0.062
				(7.31***)
LTA	-		-0.013	-0.021
			(26.45***)	(10.54***)
CFO	-		-0.107	-0.175
			(25.38***)	(24.89***)
LEV	-		0.022	0.043
			(5.18***)	(4.05***)
MKTBK	+		0.001	0.000
			(6.17***)	(0.93)
DECYE	+		0.006	0.007
			(2.94***)	(3.71***)
Adj R-Squared		0.017	0.203	0.242
F-Statistic		97.16	279.37	205.28
N		10,955	10,955	10,955

*,**,***Two-sided t-statistics are significant at the .10, .05, and .01 level, respectively.
a- Year dummy variable coefficients are excluded from the table to conserve space.
b- Interaction terms between LGAUDITOR and control variables are excluded to conserve space.
ABSPDA = the absolute value of discretionary accruals based on the model derived in Jones (1991) and further modified by Dechow et al. (1995) and Kothari et al. (2005);
STRAIN = 1 if company i's auditor is in the top decile of audit firms having a percentage increase in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
EXCESS = 1 if company i's auditor is in the bottom decile of audit firms having a percentage decrease in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
STRAINLG = the interaction between STRAIN and LGAUDITOR;
EXCESSLG = the interaction between EXCESS and LGAUDITOR;
LGAUDITOR = 1 if company i is audited by a Big 4 or second-tier auditor, 0 otherwise;
LTA = log of company i's year end total assets;
CFO = operating cash flows divided by lagged total assets,
LEV = total long-term debt scaled by total assets,
MKTBK = market value of equity divided by book value of equity at year end.
DECYE = 1 if company has a December year end, 0 otherwise.

TABLE 6
Descriptive Data and Correlations for Hypothesis 3 Test Sample

Panel A – Descriptive Data for Hypothesis 3 Sample (N=1,276)

	Mean	Std Dev	First Quartile	Median	Third Quartile
MISMATCH1	0.065	0.247	0.000	0.000	0.000
MISMATCH2	0.088	0.283	0.000	0.000	0.000
STRAIN	0.074	0.261	0.000	0.000	0.000
EXCESS	0.025	0.156	0.000	0.000	0.000
AFEES	13.134	1.360	12.193	13.253	14.064
NFEES	7.568	5.477	0.000	10.086	11.910
GDP	10.914	0.181	10.806	10.909	11.007
ΔGDP	0.006	0.029	-0.008	0.011	0.022
HERF	0.260	0.101	0.209	0.238	0.275
DECYE	0.734	0.442	0.000	1.000	1.000

Panel B – Correlations for Hypothesis 3 Sample (N=1,276)

	1	2	3	4	5	6	7	8	9	10
1- MISMATCH1	1.000									
2-MISMATCH2	-0.082***	1.000								
3- STRAIN	0.104***	-0.037	1.000							
4- EXCESS	0.024	0.027	-0.044	1.000						
5- AFEES	-0.172***	-0.206***	-0.149***	-0.135***	1.000					
6- NFEES	-0.095***	-0.104***	-0.081***	-0.030	0.393***	1.000				
7 - GDP	0.068**	-0.007	-0.005	-0.037	0.087***	-0.007	1.000			
8- ΔGDP	0.062**	-0.087***	0.011	-0.043	-0.021	-0.039	0.362***	1.000		
9- HERF	-0.068**	0.011	0.057**	0.065**	0.080***	0.094***	-0.322***	-0.128***	1.000	
10- DECYE	-0.064**	0.017	0.025	-0.027	0.046	0.025	-0.076***	-0.054*	-0.002	1.000

*,**,*** Pearson correlations significant at the .10, .05, and .01 level, respectively.

MISMATCH1 1 if a client is audited by a small audit firm when it is expected to be audited by a large audit firm, zero otherwise;
MISMATCH2 1 if a client is audited by a large audit firm when it is expected to be audited by a small audit firm, zero otherwise;
STRAIN 1 if company i's auditor is in the top decile of audit firms having a percentage increase in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
EXCESS 1 if company i's auditor is in the bottom decile of audit firms having a percentage decrease in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
AFEES log of total audit fees paid by company i for a first year audit engagement;
NFEES log of total nonaudit fees plus one;
GDP yearly GDP per capita per local audit office's MSA;
ΔGDP change in yearly GDP per capita per local audit office's MSA;
HERF the industry Herfindahl index calculated as the sum of squared industry market shares (in audit fees) of all local audit offices in an MSA;
DECYE 1 if company has a December year end, 0 otherwise.

TABLE 7
Results of Mismatch Test

	Sign	Mismatch1[a]	Mismatch2[a]
Constant		-37.364	-9.669
		(13.92***)	(1.67)
STRAIN	-	0.848	-0.799
		(5.13**)	(2.91*)
EXCESS	+	-0.344	-0.354
		(0.13)	(0.35)
AFEES		-0.544	-0.643
		(26.55***)	(42.77***)
NFEES		-0.021	-0.033
		(0.67)	(2.42)
GDP		3.776	1.065
		(16.18***)	(2.35)
ΔGDP		-15.357	-11.206
		(4.14**)	(3.11*)
HERF		-2.155	1.639
		(1.07)	(2.25)
DECYE	-	-0.245	0.292
		(0.75)	(1.22)
Likelihood Ratio		147.242	164.028
p value		<0.001***	<0.001***
N		1,276	1,276

*,**,*** Chi-square statistics are significant at the .10, .05, and .01 level, respectively.
a- Year and industry dummy variable coefficients are excluded from the table to conserve space.

MISMATCH1 = 1 if a client is audited by a small audit firm when it is expected to be audited by a large audit firm, zero otherwise;
MISMATCH2 = 1 if a client is audited by a large audit firm when it is expected to be audited by a small audit firm, zero otherwise;
STRAIN = 1 if company i's auditor is in the top decile of audit firms having a percentage increase in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
EXCESS = 1 if company i's auditor is in the bottom decile of audit firms having a percentage decrease in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
AFEES = log of total audit fees paid by company i for a first year audit engagement;
NFEES = log of total nonaudit fees plus one;
GDP = yearly GDP per capita per local audit office's MSA;
ΔGDP = change in yearly GDP per capita per local audit office's MSA;
DECYE = 1 if company has a December year end, 0 otherwise.

TABLE 8
Descriptive Data and Correlations for Hypothesis 4 Test Sample

Panel A – Descriptive Data for Hypothesis 4 Samples

	Full Sample (N=21,693)					Matched Sample (N=6,360)				
	Mean	Std Dev	First Quartile	Median	Third Quartile	Mean	Std Dev	First Quartile	Median	Third Quartile
ABSPDA	0.099	0.136	0.021	0.051	0.115	0.131	0.158	0.032	0.076	0.165
MISMATCH1	0.074	0.262	0.000	0.000	0.000	0.252	0.434	0.000	0.000	1.000
MISMATCH2	0.073	0.260	0.000	0.000	0.000	0.248	0.432	0.000	0.000	0.000
LTA	5.372	2.287	3.704	5.340	6.994	3.667	1.191	2.894	3.627	4.430
CFO	-0.001	0.304	-0.027	0.071	0.142	-0.106	0.424	-0.178	0.006	0.111
LEV	0.173	0.231	0.000	0.085	0.270	0.123	0.225	0.000	0.012	0.154
MKTBK	2.874	6.147	1.133	2.022	3.608	2.929	7.581	0.919	1.882	3.758
DECYE	0.675	0.468	0.000	1.000	1.000	0.657	0.475	0.000	1.000	1.000

Panel B – Correlations for Hypothesis 4 Samples

	ABSPDA	MISMATCH1	MISMATCH2	LTA	CFO	LEV	MKTBK	DECYE
Full Sample (N=21,693)								
ABSPDA	1.000							
MISMATCH1	0.033***	1.000						
MISMATCH2	0.097***	-0.079***	1.000					
LTA	-0.421***	-0.104***	-0.316***	1.000				
CFO	-0.418***	0.001	-0.182***	0.431***	1.000			
LEV	-0.024***	-0.035***	-0.068***	0.205***	-0.027***	1.000		
MKTBK	0.043***	-0.025***	0.008	-0.026***	-0.042***	-0.115***	1.000	
DECYE	0.019***	0.020***	-0.029***	0.078***	-0.051***	0.100***	0.018***	1.000
Matched Sample (N=6,360)								
PDA	1.000							
MISMATCH1	-0.055***	1.000						
MISMATCH2	0.061***	-0.333***	1.000					
LTA	-0.296***	0.417***	-0.418***	1.000				
CFO	-0.386***	0.140***	-0.148***	0.349***	1.000			
LEV	0.253***	-0.049***	0.074	-0.215***	-0.232***	1.000		
MKTBK	0.013	-0.050***	0.007	-0.096***	-0.093***	-0.170***	1.000	
DECYE	0.035***	0.064***	-0.037***	0.069***	-0.111***	0.031***	0.012	1.000

*,**,*** Pearson correlations are significant at the .10, .05, and .01 level, respectively.

ABSPDA = the absolute value of discretionary accruals based on the model derived in Jones (1991) and further modified by Dechow et al. (1995) and Kothari et al. (2005);

MISMATCH1 = 1 if a client is audited by a small audit firm when it is expected to be audited by a large audit firm, zero otherwise;

MISMATCH2 = 1 if a client is audited by a large audit firm when it is expected to be audited by a small audit firm, zero otherwise;

LTA = log of company i's year end total assets;

CFO = operating cash flows divided by lagged total assets,

LEV = total long-term debt scaled by total assets,

MKTBK = market value of equity divided by book value of equity at year end.

DECYE = 1 if company has a December year end, 0 otherwise.

TABLE 9
Results of Discretionary Accruals-Mismatch Test

		ABSPDA[a]			
		Unmatched		Matched	
	Sign	Difference[b] in Means	Multiple Regression	Difference[b] in Means	Multiple Regression
Constant			0.191		0.237
			(62.34***)		(29.25***)
MISMATCH1	+	-0.021	-0.002	0.0261	0.024
		(6.08***)	(0.62)	(5.62***)	(5.20***)
MISMATCH2	-	-0.053	-0.029	-0.0218	-0.024
		(14.94***)	(8.91***)	(3.69***)	(5.21***)
LTA	-		-0.019		-0.033
			(45.98***)		(16.73***)
CFO	-		-0.127		-0.118
			(43.14***)		(25.87***)
LEV	+		0.018		0.025
			(5.08***)		(3.14***)
MKTBK	+		0.001		-0.001
			(4.61***)		(2.86***)
DECYE	+		0.007		-0.001
			(4.09***)		(2.86***)
Adj R-Squared			0.251		0.190
F-Statistic			605.73		124.36
N			21,693		6,360

*,**,*** Two-sided t-statistics are significant at the .10, .05, and .01 level, respectively.

a- Year dummy variable coefficients are excluded from the table to conserve space.

b- An independent samples t-test was used in the unmatched sample and a paired samples t-test was used in the matched sample.

ABSPDA = the absolute value of discretionary accruals based on the model derived in Jones (1991) and further modified by Dechow et al. (1995) and Kothari et al. (2005);

MISMATCH1 = 1 if a client is audited by a small audit firm when it is expected to be audited by a large audit firm, zero otherwise;

MISMATCH2 = 1 if a client is audited by a large audit firm when it is expected to be audited by a small audit firm, zero otherwise;

LTA = log of company i's year end total assets;

CFO = operating cash flows divided by lagged total assets,

LEV = total long-term debt scaled by total assets,

MKTBK = market value of equity divided by book value of equity at year end.

DECYE = 1 if company has a December year end, 0 otherwise.

TABLE 10
Results of Discretionary Accruals Test

	Sign	ABSPDA	
		December Year End[a]	Non-December Year End[a]
Constant		0.176	0.221
		(16.40***)	(20.04***)
STRAIN	+/-	0.030	0.013
		(3.85***)	(1.54)
EXCESS	+/-	0.033	0.017
		(1.94*)	(1.06)
STRAINLG	+/-	-0.030	-0.018
		(2.98***)	(1.69*)
EXCESSLG	+/-	-0.024	-0.009
		(1.30)	(0.50)
LGAUDITOR	-	-0.040	-0.097
		(3.46***)	(8.11***)
LTA	-	-0.040	-0.097
		(6.07***)	(10.03***)
CFO	-	-0.186	-0.157
		(20.87***)	(13.36***)
LEV	-	0.060	0.010
		(4.56***)	(0.57)
MKTBK	+	0.000	0.000
		(1.21)	(0.49)
DECYE	+	0.000	-0.002
		(0.15)	(0.44)
Adj R-Squared		0.228	0.284
F-Statistic		138.27	85.31
N		7,489	3,466

*,**,***Two-sided t-statistics are significant at the .10, .05, and .01 level, respectively.
a- Year dummy variable coefficients and interaction terms between LGAUDITOR and control variables are excluded from the table to conserve space.

ABSPDA = the absolute value of discretionary accruals based on the model derived in Jones (1991) and further modified by Dechow et al. (1995) and Kothari et al. (2005);
STRAIN = 1 if company i's auditor is in the top decile of audit firms having a percentage increase in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
EXCESS = 1 if company i's auditor is in the bottom decile of audit firms having a percentage decrease in MSA total assets audited from year t-2 to year t-1 calculated yearly, 0 otherwise;
STRAINLG = the interaction between STRAIN and LGAUDITOR;
EXCESSLG = the interaction between EXCESS and LGAUDITOR;
LGAUDITOR = 1 if company i is audited by a Big 4 or second-tier auditor, 0 otherwise;
LTA = log of company i's year end total assets;
CFO = operating cash flows divided by lagged total assets,
LEV = total long-term debt scaled by total assets,
MKTBK = market value of equity divided by book value of equity at year end.
DECYE = 1 if company has a December year end, 0 otherwise.

FIGURE 1
Going Concern Opinion Decisions and Errors