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**Aggregate Quasi Rents and Auditor Independence:
Evidence from Audit Firm Mergers in China**

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Aggregate Quasi Rents and Auditor Independence: Evidence from Audit Firm Mergers in China

ABSTRACT

Using a sample of audit firm mergers in China's audit market, this paper provides evidence on how auditor independence can be improved following audit firm mergers as a result of a change in aggregate quasi rents that are exposed to risk (i.e., quasi rents at stake). The setting allows us to examine directly the relationship between aggregate quasi rents at stake and independence after controlling for the confounding effects of auditor competence, audit firm brand name, and the self-selection problem that could exist in previous studies. We hypothesize that auditors become more independent in the post-merger period only if the mergers increase their aggregate quasi rents at stake. Proxying audit quality by the frequency of modified audit opinions (MAOs), we conduct separate tests for two types of mergers: one with an increase in aggregate quasi rents at stake and the other with little change in quasi rents at stake under the institutional arrangements in China. We observe more MAOs after mergers, but only for the type of mergers that increases auditors' aggregate quasi rents at stake. Moreover, within this type of mergers, the post-merger increase in the propensity of MAOs is positively associated with the magnitude of expected change in aggregate quasi rents at stake. Our findings are consistent with the theory that auditor independence is a positive function of aggregate quasi rents at stake.

Keywords: Audit quality; Auditor independence; Quasi rents; Audit firm mergers

JEL Descriptors: G34, L10, M42

Aggregate Quasi Rents and Auditor Independence: Evidence from Audit Firm Mergers in China

1. Introduction

In an influential study, DeAngelo (1981) shows that auditors' commitments to independence are positively related to audit firm size. She argues that large audit firms have more aggregate quasi rents, defined as audit fees in excess of audit costs, serving as collateral against auditors' opportunistic behavior. Because auditors in large audit firms have "more to lose" if they fail to report breaches in clients' accounting reports, they are motivated to provide higher quality audit services. Consistent with this argument, researchers have found that audit firm size is positively correlated with audit quality. For example, Big N audits help to constrain firms' earnings management (Becker, DeFond, Jiambalvo, and Subramanyam 1998; Francis, Maydew, and Sparks 1999). The Big N firms are also more conservative in issuing clean audit reports to their clients (Francis and Krishnan 1999). Accounting information provided by the clients of Big N is perceived to be more useful by the stock market (Teoh and Wong 1993) and employing Big N auditors helps firms to lower the cost of capital (Pittman and Fortin 2004).

However, empirical evidence on the relationship between audit firm size and auditor independence is confounded by a number of factors. First, as Watts and Zimmerman (1986) point out, audit quality is a joint product of auditors' competence (i.e., the ability of an auditor to discover a breach) and independence (i.e., auditor's propensity to report the discovered breach). Dopuch and Simunic (1980a, b) suggest that auditors in large audit firms are more competent than those in small firms. For example, large audit firms are better able to recruit graduates from leading universities, hire reputable specialists from labor markets, and offer specialized training to their staff. Peer reviews are also more prevalent and rigorous in large audit firms. Therefore, audit firm size affects not only independence but also competence. This makes clear inferences on the relationship between audit firm size and independence difficult.¹

The second confounding factor is the brand name effect. The brand name investment model (Klein and Leffler 1981) predicts that auditors are motivated to maintain audit quality to protect their brand name once it is established. In previous studies, researchers generally compare the audit quality between Big N and non-Big N firms, and use the membership of Big N to proxy for

audit firm size. Since Big N are all brand name producers, the difference in audit quality between Big N and non-Big N could be driven by Big Ns' incentives to protect their brand names, even if competence is constant among auditors and only independence matters.

Finally, the match between clients and auditors is not random. On the demand side, clients select audit firms that best meet their needs to lower costs (Johnson and Lys 1990). On the supply side, audit firms select their clients strategically to reduce audit risks (Shu 2000; Johnstone and Bedard 2004). The non-randomness of auditor choice suggests that the observed audit quality difference between Big N and non-Big N could be caused by this self-selection.² Although techniques such as the Heckman (1979) two-stage procedure have been applied to correct the selectivity problem, Francis (2004, p.354) cautions: "endogeneity and selection cannot be entirely ruled out as an alternative explanation and more work is needed on this important topic." This is echoed by Francis and Lennox (2008), who underscore the pitfalls associated with the application of the Heckman procedure in accounting and auditing literature.

Using data on audit firm mergers in China, we investigate the empirical relationship between audit firms' aggregate quasi rents at stake and auditor independence in a setting that allows us to mitigate the above problems. As will be discussed in more details later, prior research on auditor expertise suggests that mergers are not likely to affect auditors' competence immediately. However, mergers do have an immediate and significant impact on audit firm size and auditors' aggregate quasi rents. Therefore, changes in audit quality *immediately* after mergers can be attributed mainly to changes in auditors' independence rather than competence. Moreover, we investigate the difference in auditor independence between the pre- and the immediate post-merger period of the same audit firms, instead of the cross-sectional difference between Big N and non-Big N firms. Such a design is less subject to the brand name effect or the self-selection problem.

Unlike the U.S. or other developed countries where the vast majority of public companies are audited by the Big N, China's audit market is dominated by small domestic audit firms during our sample period. As predicted by the theory that merger waves result from the shocks to an industry's environment (Harford 2005), the economic and regulatory changes in China's audit market induced a large number of audit firm mergers in a short period of time. We are thus able to

study the impact of mergers on audit quality in a similar regulatory environment for an important economy. This is an important reason why we study this issue using data from China's audit market. In addition, the institutional setting in China allows us to split our sample into two groups of mergers. In one group, mergers occur between two (or more) CPA firms licensed to audit listed companies (referred to as multi-license mergers), and in the other group, a CPA firm with such a license merges with non-licensed ones (referred to as single-license mergers). Since non-licensed firms do not have listed clients and regulators focus their attention on listed companies and their auditors in China, we expect that multi-license mergers would lead to a larger increase in quasi rents that are exposed to risks (thus making auditors' opportunistic behavior more costly) than the single-license mergers.³ The difference between the two groups in the post-merger audit quality change would thus manifest how quasi rents at stake affect auditor independence. Such a natural experiment setting helps to test DeAngelo's (1981) theory that auditor independence is positively related to the aggregate quasi rents at stake.

We proxy auditor independence by audit opinions and examine the change in auditors' propensity to issue modified audit opinions (MAOs) around the time of audit firm mergers. We find that auditors issue more MAOs after the multi-license mergers. In addition, the increase in MAOs is positively correlated with the magnitude of audit firm size change caused by the mergers. However, there is no significant change in MAOs after the single-license mergers, where we expect little increase in quasi rents at stake. The overall evidence supports the DeAngelo theory.

This study also contributes to the literature in other respects. To a large extent, the mergers of Chinese audit firms are induced by government policies attempting to enhance domestic auditors' ability to compete with the large international audit firms after China's entrance to the World Trade Organization (WTO). Our findings have policy implications to China's regulators in evaluating the effectiveness of their policies. Moreover, the monitoring role played by auditors is crucial in mitigating agency problems in emerging markets, where the conventional corporate governance mechanisms are weak (Fan and Wong 2005; Choi and Wong 2007). This study is thus of interest to regulators on how to improve the corporate governance of public companies by fostering auditor independence in China. After China joined the WTO and gradually opened its

accounting market, international accounting firms have increased their presence in China's audit market. How mergers influence domestic auditors' quality and the audit market structure in China is highly relevant to these international accounting firms in designing their marketing strategy.

The next section presents the institutional background. In the third section, we develop the hypotheses tested in the paper. Section 4 describes the sample data. The main empirical tests are reported in the fifth section. The sixth section examines whether the results are open to alternative explanations and analyzes the variation in post-merger improvement in audit quality. The final section concludes the paper.

2. Institutional background

The economic reforms in China since 1979 brought about structural changes in its national economy. The entrance of foreign investment enterprises and the restructuring of state-owned enterprises (SOEs) into joint stock companies created demand for independent audits. In 1980, the first Chinese CPA firm was established in Shanghai, followed by thousands of new firms nationwide (Tang 2000). In the early 1990s, China established the Shanghai and Shenzhen stock exchanges. To perform audit services for listed companies, CPA firms must obtain a license from the China Securities Regulatory Commission (CSRC) and the Ministry of Finance (MOF).

Although the growth of the accounting profession in China has been rapid, most domestic CPA firms remain small-scale. According to the CSRC (2001), there were 106 CPA firms licensed to audit listed companies at the end of 1999 (before most mergers took place in China). On average, each had less than 10 listed clients. Furthermore, the market share for the largest 20 CPA firms was only 49.6% (60.4%) in terms of the number of listed clients (listed clients' total assets).⁴ At the turn of the millennium, the profession was concerned about whether domestic firms could compete with the large international accounting firms when they were allowed to operate directly in China after China's accession to the WTO.⁵ As indicated by Mr. Yunwei Tang, a senior partner of a leading CPA firm in China, many practitioners believe that one important way to enhance their competitiveness is to increase firm size through mergers (*China Securities News* 2000).

The CPA firm merger wave was also activated by the advance in China's economic reform.

Guided by the philosophy of “crossing the river by touching the stones”, the Chinese government first targeted small and medium-sized SOEs for restructuring into corporations (Sun and Tong 2003). As the government gains experience, more and more large SOEs are opened up for the reform in the late 1990s. The government began to pay close attention to whether the supply of quality audit services provided by domestic audit firms is sufficient to meet the increasing demand from SOE reforms (*China Finance and Economics Newspaper* 2000). To induce CPA firms to increase their size, the government issued several regulations. According to a regulation issued in 1997, a CPA firm is eligible to apply for a license to audit listed companies if it employs more than 8 individual CPAs who have passed additional professional examinations and obtained the qualification from CSRC to sign audit reports for listed companies. In June 2000, CSRC and MOF issued a new regulation, which increases this number from 8 to 20. The regulators also set a new threshold by which CPA firms must have annual revenues over 8 million RMB yuan (*Ren Min Bi*, the Chinese currency) to audit listed companies. As this exceeded many CPA firms’ revenues in 1999 and the number of qualified CPAs in China is limited, the most efficient way for small CPA firms to retain their license to audit listed companies is to merge with other CPA firms.⁶ In July 2000, the MOF promulgated *Provisional Regulations on CPA Firms’ Performing Audit Service in the Banking Industry*, which stipulates that a CPA firm is not eligible to perform audit service to selected banks if it employs less than 60 CPAs or its prior year’s revenue is lower than 15 million RMB. Thus, to maintain a market share in the banking industry is also an incentive for many CPA firms to merge.

Taken together, there are both market-based incentives and regulatory reasons for Chinese CPA firms to increase firm size via mergers. The first merger appeared in 1999, when Zhong Rui merged with Hua Xia. From 1999 to 2006, there are 68 merger cases involving CPA firms licensed to audit listed companies. Largely because of these mergers, the number of licensed CPA firms decreased from 106 in 1999 to 72 in 2006.

3. Hypotheses development

3.1 The impacts of merger on a CPA firm’s willingness to compromise independence

To analyze the impacts of merger on auditor independence, we follow Chung and Kallapur’s

(2003, 934-935) framework, which elaborates on DeAngelo's original analysis. Specifically, the value of audit firm A can be expressed as:

$$V^A = QR_c + QR_o^A, \quad (1)$$

where QR_c denotes the present value of future quasi rents specific to client c , and QR_o^A denotes the present value of all other future quasi rents of firm A . Consistent with DeAngelo (1981), we define quasi rents as audit fees in excess of audit costs. To retain client c and earn QR_c , A could compromise independence since c can deny QR_c to A by switching to other audit firms if A insists on reporting a discovered breach. Denote the probability that client c will fire A for reporting the breach as P_{fire} . When A selects to be independent, V^A becomes:

$$(1 - P_{fire})QR_c + QR_o^A. \quad (2)$$

However, A risks QR_o^A by compromising independence since the value of audit depends on its reputation and it could lose clients if such a malfeasance becomes known. Denote the probability of a compromise by A being detected by the outside as P_{detect}^A and the fraction of the other quasi rents lost upon detection as α^A . When A selects to compromise and retain c , V^A is:

$$QR_c + (1 - P_{detect}^A \alpha^A) QR_o^A. \quad (3)$$

Chung and Kallapur (2003) suggest that, to maximize its wealth, A will compromise independence when (3) is larger than (2). This condition can be simplified to:

$$P_{fire} QR_c > P_{detect}^A \alpha^A QR_o^A. \quad (4)$$

That is, auditors will compromise independence to retain c when the expected loss of quasi rents from c is larger than the expected loss of quasi rents from all other clients. *Ceteris paribus*, audit firm's incentives to compromise independence to a specific client hinge on the magnitude of QR_o^A . Having more aggregate quasi rents serving as collateral, large audit firms have more to lose if their opportunistic behavior becomes known.

Now assume that two audit firms, A and B , merge into a new firm, AB .⁷ We use the superscripts B and AB to denote the parameters for B and the merged firm AB , respectively. When AB chooses to acquiesce to client c , the value of the merged firm AB , V^{AB} , becomes:

$$QR_c + (1 - P_{detect}^A \alpha^A) QR_o^A + (1 - P_{detect}^B \alpha^B) QR_o^B. \quad (5)$$

If AB chooses to maintain independence, then V^{AB} is:

$$(1 - P_{fire}) QR_c + QR_o^A + QR_o^B. \quad (6)$$

Thus, the condition for AB to retain c by compromising independence becomes:

$$P_{fire}QR_c > P^A_{detect}\alpha^A QR^A_o + P^B_{detect}\alpha^B QR^B_o. \quad (7)$$

Since $P^B_{detect}\alpha^B QR^B_o$ is strictly positive, the threshold for the merged firm, AB , to compromise independence is higher than that of firm A . By aggregating the quasi rents of two firms, merger essentially makes it more costly for auditors to compromise independence. We therefore predict that post-merger audit firm is less likely to compromise independence to retain a specific client.

Although Chinese auditors' exposure to litigation risk is lower than their U.S. counterparts, there are regulatory bodies in place to oversee the activities of audit firms. In emerging capital markets, where the costs of verifying the circumstances of specific cases and interpreting statutes are high, enforcement by regulators can be a more efficient way to foster the independence of intermediaries than judicial enforcement (Glaeser, Johnson, and Shleifer 2001; La Porta, Lopez-de-Silanes, Shleifer, and Vishny 2000). Indeed, sanctions taken by China's regulators, such as the CSRC and MOF, against audit failure could be harsh. These sanctions include public reprimand, warnings, fines, suspension or revocation of license to practice, and even imprisonment. From 1993 to 2003, the number of sanctions taken by the CSRC against CPA firms and individual CPAs are 29 and 71, respectively (CSRC, 2003). This suggests that regulators do take actions to detect auditor's opportunistic behavior and P_{detect} should play a role in auditors' decision makings.

Suspension or revocation of license could result in the shut-down of CPA firms and thus the loss of all quasi rents. For instance, in 1998, CSRC revoked the licenses of SiChuan and ShuDu CPA firms for their audit failures in "Orient Boiler" and "Chengdu HongGuang", respectively. These two firms lost all of their listed clients in that year. The potential penalty imposed on audit firms could also result in the dismissal of auditors by clients. In 2000, the CSRC investigated Hubei LiHua CPA firm because some of its clients had been found to violate securities laws. Being concerned with its tarnished reputation, other clients dismissed this CPA firm quickly (*Securities Times*, 2001). These cases suggest that α , the fraction of other quasi rents lost upon detection, could be quite large. In extreme cases where CPA firm's license to practice is revoked, α is 100%.

3.2 The impacts of merger on quasi rents

In the above analysis, we assume that merger *per se* does not change QR^A_o or QR^B_o . However, merger could also affect the present value of quasi rents through its impacts on audit costs and audit prices. Evidence from the merger literature suggests that future operating costs of merged firms are likely to be lower since increased firm size is usually followed by improved production efficiency arising from greater realization of the economies of scale, elimination of overlapping facilities, etc.⁸ Consistent with this, Ivancevich and Zardkoohi (2000) and Sullivan (2002) report that the 1989 mergers in the U.S. (creating Ernst & Young and Deloitte & Touche) lead to a decrease in costs for the merged audit firms relative to their rivals.

In a highly competitive market, auditors price audit services marginally higher than audit costs. If mergers lower audit costs, then auditors could also cut audit fees after mergers. While the audit market for listed firms in China is competitive, only the licensed audit firms are allowed to audit listed companies. In a market with entry barriers, mergers could lead to higher prices since mergers reduce the number of suppliers and enhance the market power of the merged suppliers (Stigler 1964). The new regulation promulgated by the CSRC and MOF in 2000 increase the difficulty of entry for non-licensed audit firms. Moreover, the Chinese Institute of Certified Public Accountants (CICPA) and the Pricing Bureau set a minimum limit on audit fee, which is based on a percentage of a client's total assets (e.g., see Beijing Pricing Bureau, 2001). This minimum price ensures that auditors will not price below cost, which could affect audit quality.

As how the mergers affect audit pricing is an empirical question, we examine whether audit price changes around mergers in the Appendix. The regression results suggest that there is no significant change in audit fees immediately after mergers. In fact, audit fees increase slightly. Furthermore, China's minimum audit fee system generally provides a reasonable profit for audit work. Therefore, any reduction in audit costs should improve CPA firms' profits or quasi rents. We therefore anticipate that mergers would increase auditors' expected quasi rents and make any compromise of independence to retain a client more costly to the auditors.⁹

3.3 Merger types and their impacts on quasi rents at stake

As mentioned before, not all audit firms in China have a license to audit listed companies. Therefore, there are two types of mergers in our sample. One is mergers between two CPA firms

that have licenses to audit listed companies (*multi-license mergers*), and the other is mergers between a licensed firm and a firm without a license to audit listed companies (*single-license mergers*).¹⁰ Recall that mergers would motivate auditors to improve independence because the threshold for auditors to compromise independence increases from $P^A_{detect}\alpha^A QR^A_o$ before merger to $(P^A_{detect}\alpha^A QR^A_o + P^B_{detect}\alpha^B QR^B_o)$ after mergers. However, in single-license mergers, if A is a licensed firm and B is a non-license firm, the net impact of mergers could be different from that of multi-license mergers.

The regulatory oversight ensures that P_{detect} takes a positive value in China. However, regulatory penalties are primarily restricted to audit failure for listed companies, because listed companies are more visible to the public and government enforcement focuses on audits of listed companies and licensed CPA firms. This suggests that P^B_{detect} is small in single-license mergers. Licensed firms also differ from non-licensed firms in α , the fraction of other quasi rents lost upon detection. Compared with the public firms audited by licensed firms, the clients of non-licensed CPA firms in China should be less concerned about auditor reputation since they are all non-public firms and are not really visible to the public. Being concerned with auditor switch costs, such non-listed clients may not dismiss auditors even though auditors' opportunistic behavior has been detected by the outside. This suggests that the economic consequence of detected audit failures, α^B , should be lower if B is a non-licensed firm in the mergers.

Given that both P^B_{detect} and α^B are likely to be smaller if B is a non-licensed firm, the magnitude of $P^B_{detect}\alpha^B QR^B_o$, or the increase in the aggregate quasi rents *at stake* after mergers, should be lower in single-license mergers than that in multi-license mergers. We therefore classify all mergers into two types in testing the effect of mergers on auditor independence: *multi-license mergers* where there are at least two constituent licensed CPA firms, and *single-license mergers* where there is only one licensed CPA firm involved in the mergers. We expect the increased quasi rents at stake after mergers would motivate auditors in the multi-license group to be more independent. The first null hypothesis of this study is stated as:

HYPOTHESIS 1: *There is no improvement in auditor independence after multi-license mergers.*

While we expect that P^B_{detect} and α^B will be small in single-license mergers and thus this type

of merger will have little impact on auditor independence, the exact values of these parameters are not readily observable to us. Therefore, we treat the effects of single-license mergers on auditor independence as an empirical question and test the following hypothesis:

HYPOTHESIS 2: *There is no improvement in auditor independence after single-license mergers.*

3.4 Merger and competence

While mergers may also affect auditors' competence, such an effect should be small *immediately* after the mergers because specific knowledge about a particular client of an audit firm is difficult to transfer (Fama and Jensen 1983). Results from audit judgment research show that years of experience help to explain auditors' performance (Frederick and Libby 1986). Bonner and Lewis (1990) further find that auditors' client-related knowledge acquired from client or industry specific experience provides the best explanations of auditor expertise. Moreover, auditors may not share their specific knowledge straightly through general instruction. Bonner and Walker (1994) demonstrate that instruction without experience (through practice and feedback) cannot produce knowledge in training auditors. The laboratory evidence is corroborated by archival research. Ferguson, Francis, and Stokes (2003) report that the fee premium for industry expertise in Australia is only specific to offices where accounting firms are the city-level industry leaders. The premium, however, is not enjoyed by other offices located in cities where they are not industry leaders. This finding indicates that it is not easy to distribute expertise across offices even within the same audit firm.

In our research design, we define the post-merger period as the first year in which auditors issue audit reports in the name of the merged audit firms. These post-merger audit reports are in effect issued by auditors only several months after mergers. Given the difficulty in transferring such client-specific knowledge to other auditors immediately after the mergers and the importance of such knowledge on auditor competence, we expect that any change in auditors' competence *immediately* in the year of merger should be minimal. Indeed, one may even expect mergers to cause temporary disruption and coordination problems, which could reduce auditor competence in the merger year.

Moreover, single- and multi-license groups are quite comparable before mergers in terms of

their listed clientele, as we will show later. If the competence effect exists, improvement in audit quality should be observed in both groups. Evidence on improved audit quality specific only to the multi-license mergers is more consistent with the idea that mergers improve auditor independence by increasing auditors' quasi rents at stake. We also conduct several tests in section 6.3 to investigate whether post-merger change in competence, if any, can explain our findings.

4. Research method and sample data

Since the loss of quasi rents caused by regulatory sanctions can be significant in China, auditors should issue modified audit opinions (MAOs) when appropriate to avoid such sanctions. Several studies (DeFond, Wong, and Li 2000; Chen, Chen, and Su 2001; Chan, Lin, and Mo 2006; Wang, Wong, and Xia 2008) also suggest that MAOs have reasonable power to capture variations in audit quality in different research settings in China. Following these studies, we test the above hypotheses by examining post-merger changes in auditors' propensity to issue MAOs.

Operationally, we compare audit reports for the first fiscal year influenced by the audit firm mergers (year 0), with those for the most recent three years prior to year 0 (year -3 to -1). We define year 0 as the first year in which auditors issue audit reports in the name of the merged audit firms. In anticipation of the mergers, auditors may have incentives to be more independent in year -1. This would work against our tests. In other words, if this is the case, our findings will be conservative. Observations after year 0 are not included so that improvement in auditors' competence, which should emerge in a longer horizon, will not confound with the improvement in independence.

From the Chinese Institute of CPAs and several leading financial newspapers, we collected data for audit firm mergers that took place between 1999 and 2006. The identity of the CPA firms and whether they have a license to audit listed companies were checked against *Who Audits China's Securities Market* published by the China Securities Regulatory Commission. Client firms' financial statement and stock market data are from the *China Stock Market & Accounting Research Data Base* (CSMAR).

We identify 68 mergers from the CPA firms with a license to audit listed companies. To ensure that we have pure pre-merger data, we delete 4 cases that took place after the firms

consummated other earlier mergers. We also delete 5 cases where the CPA firms do not perform audits to listed companies before mergers. The remaining 59 cases include 21 multi-license mergers (MULTI hereafter) and 38 single-license mergers (SINGLE hereafter). Panel A of Table 1 shows the distribution of these two types of mergers by time. It is clear that a substantial number of observations have year 0 in 2000.¹¹ In section 6.1, we consider the possible impacts of time-clustering on the results.

[Insert Table 1 here]

In Panel B, we report the mean number of firms involved in each type of mergers (MULTI or SINGLE) and the types of CPA firm (licensed or not). By definition of the merger types, there are more licensed CPA firms than non-licensed ones in the MULTI group. However, the last column of Panel B suggests that there is no significant difference in the total number of CPA firms involved between the two types of mergers.

To further examine the characteristics of the merging CPA firms, we show the mean value of several variables measuring the size of listed clientele in Panel C: the number of listed clients, the total assets of listed clients audited, and the number of CPAs that issue auditor reports to listed clients. The pre- and post-merger data are assembled according to the CPA firms' listed clients in the most recent year before mergers and at the end of the merger year, respectively. When the pre-merger data of the MULTI group are compared with those of the SINGLE group, we find no significant difference between them in any measure. This suggests that audit firms in the MULTI group are comparable to those in the SINGLE group in terms of listed clientele, had they not merged. However, the post-merger data indicate that the MULTI group grows substantially in all measures and it becomes significantly larger than the SINGLE group in terms of *listed clientele*.

The above analysis is based on listed clients. However, the SINGLE group acquires only non-licensed firms, which do not have listed clients. It is thus inappropriate to infer that mergers do not change firm size in the SINGLE group. An appropriate measure is the change in revenues from both listed and non-listed clients around mergers. The CICPA occasionally published the revenue rankings of Chinese CPA firms. From its website, we are able to collect the total revenues (earned from *both* listed *and* non-listed clients) of 1999 and 2002 for 17 MULTI and 25 SINGLE mergers that took place in 2000.¹² Panel D presents the mean annual revenues (in

millions RMB yuan) for these firms. From 1999 (one year before mergers) to 2002 (two years after mergers), total revenues for both groups grow considerably. Moreover, there is *no* significant difference between two groups before or after mergers in terms of total revenues. By taking more non-listed clients, CPA firms in the SINGLE group keep pace with those in the MULTI group in terms of growth, although mergers affect the SINGLE group's listed clientele only marginally.¹³

In sum, merger types (MULTI vs. SINGLE) affect the characteristics of constituent CPA firms' listed clientele differently. Given that two groups are comparable in listed clientele before mergers and in overall firm size (in terms of annual total revenues) before or after mergers, increase in firm size for the MULTI group is primarily caused by larger listed clientele whereas that for the SINGLE group mainly results from taking more non-listed clients. Therefore, different changes in auditor behavior after mergers between two groups of audit firms are very likely due to different impacts of mergers on listed clientele, which is more subject to regulatory scrutiny (i.e., higher values of the P_{detect} and α parameters for listed clientele). In section 6.2, we will analyze whether the audit firms' choice of merger types endogenously affects our results.

There are 2,879 client firm-years audited by the merged CPA firms (including both MULTI and SINGLE groups) from year -3 to 0. Because our focus is on whether auditor independence improves after mergers, we require that: (1) client firms have at least one pre-merger observation, and (2) the client firms are audited by the same CPA firm in the pre- and post-merger years. By these criteria, we deleted: (1) 89 observations for client firms that are first listed in year 0 and thus do not have pre-merger data; and (2) 442 observations for client firms that have changed auditors in any year between year -3 and 0. The final sample includes 1,047 and 1,301 client firm-years for the MULTI and the SINGLE groups, respectively.

5. Analysis of auditors' reporting decisions

We use the frequency of MAOs as proxy for audit independence, consistent with DeFond et al. (2000), Chen et al. (2001), Chan et al. (2006), and Wang et al. (2008). Analogous to the U.S. or International GAAS, the Chinese Independent Auditing Standards specify four types of audit opinions: unqualified, qualified, disclaimer, and adverse. It is also stipulated that explanatory notes can be used with unqualified opinions when deemed necessary. Although the CICPA

interprets unqualified opinions with explanatory notes in a manner similar to the “emphasis of a matter” in the U.S. GAAS, this type of audit report is often issued in place of a qualified opinion in China.¹⁴ Consistent with previous studies, we classify auditors’ reports into two categories: (1) clean reports, and (2) modified audit opinions (MAOs), including unqualified but with explanatory notes, qualified, disclaimed, and adverse opinions. We present the relative frequency of these MAOs for the population of Chinese listed firms from 1993 to 2006 in Figure 1 (there is no MAO before 1993 in China). Consistent with DeFond et al. (2000), there is a significant increase in MAOs in 1995, when the CICPA promulgated the first batch of independent auditing standards. The relative frequency of MAOs reaches its peak at in 1999, decreases in the following years, but stabilizes in recent years. Note that year 2000 is the event year 0 for most merger cases in our sample, and the relative frequency of MAOs in this year for the whole population is lower than that in the preceding years. This might work against finding evidence on increase in MAOs in year 0 for our merger sample.

[Insert [Figure 1](#) here]

5.1 Univariate analysis

Table 2 reports the χ^2 tests on whether the frequency of MAOs is independent of CPA firm mergers. In the pre-merger period, the proportion of MAOs is similar for the MULTI (Panel A) and the SINGLE (Panel B) groups. For the MULTI sample, the proportion of MAOs in the post-merger period is higher than that before mergers and the difference is significant at the 0.01 level in the χ^2 test. We thus reject the first hypothesis (H1) that there is no increase in MAOs after mergers for the MULTI sample. While there is also an increase in the proportion of MAOs in the post-merger period in the SINGLE sample, we cannot reject the second hypothesis (H2) that there is no post-merger change in audit opinions since the χ^2 statistic in Panel B is not significant.

[Insert [Table 2](#) here]

5.2 Multivariate analysis

To test our hypotheses in a multivariate setting, we estimate the following Logit model:

$$MAO = \alpha + \beta POST + \gamma_1 CURRENT + \gamma_2 ARINV + \gamma_3 LEV + \gamma_4 TURN + \gamma_5 ROA + \gamma_6 LOSS + \gamma_7 AGE + \gamma_8 EM + \gamma_9 RET + \gamma_{10} STDR + \gamma_{11} Ln(TAST) + \varepsilon, \quad (8)$$

where *MAO* is coded one if the client firm receives an MAO, and zero otherwise. *POST* is a dummy variable taking a value of one to indicate that the client firm observations are in year 0, and zero for other years. Therefore, the coefficient on *POST* represents a change in the probability of MAOs in the post-merger period.

Following prior studies on audit reporting in the U.S. (e.g., Dopuch, Holthausen, and Leftwich 1987; Bell and Tabor 1991) and in China (DeFond et al. 2000; Chen et al. 2001), we include a set of control variables in the Logit models. First, we include five financial ratios, *CURRENT* (current assets divided by current liabilities), *ARINV* (receivables and inventory divided by total assets), *LEV* (total liabilities divided by total assets), *TURN* (total sales divided by total assets), and *ROA* (earnings divided by total assets). Generally, higher levels of *CURRENT*, *TURN*, and *ROA* indicate lower audit risk. Thus, the coefficients on these variables are expected to be negative. Since higher levels of *ARINV* and *LEV* are associated with higher audit risk, their coefficients should be positive.

LOSS is a dummy variable indicating that the firm has reported a loss in a given year and is expected to have a positive coefficient. Because Chinese firms are more susceptible to financial distress after they exhaust the capital raised in the IPOs, younger firms are less likely to receive MAOs in China (DeFond et al. 2000; Chen et al. 2001). Therefore, *AGE*, defined as the number of years a company has been listed, is expected to have a positive coefficient. According to China's *Company Law*, firms will be delisted if they incurred losses for three consecutive years. As Chinese firms that manage earnings to be slightly above zero to avoid being delisted are more likely to receive MAOs (Chen et al. 2001), we use a dummy variable, *EM*, to control for this effect. It is equal to one if the client firm reported a ROE between 0 and 1 percent, and zero otherwise.¹⁵

In addition to the above financial statement variables, we include two stock market variables that could influence auditors' decisions. The market-adjusted stock returns for the fiscal year, *RET*, is to control for news incorporated into stock returns but not yet recognized in earnings. The coefficient on *RET* is expected to be negative. *STDR* is the standard deviation of residuals from

the market model.¹⁶ This variable should capture risks that are not reflected in the financial statement variables (Ali, Hwang, and Trombley 2003). Since risky firms are more likely to receive MAOs (Dopuch et al. 1987), we expect *STDR* to have a positive coefficient. Finally, we include the natural logarithm of clients' total assets, $Ln(TAST)$, in the regression. We expect the coefficient on $Ln(TAST)$ to be negative since large clients are usually less risky to the auditors due to more stable operations and better internal control systems.

We transform all the continuous variables into cross-sectional percentile ranks. Specifically, for each variable, we rank all firms in CSMAR by year and scale the percentile ranks (from 0 to 99) by 99. Thus the scaled ranks range from 0 to 1, with 0.50 indicating that the observation is at the population median. This procedure is more efficient than alternative procedures such as log transformations and sample trimming to avoid skewness and outlier problems (Lennox 2005). Table 3 reports the mean of the raw values and scaled percentile ranks for these variables by group (MULTI or SINGLE) and periods (pre- or post-merger). The univariate *t*-test is performed to examine the difference between the two periods.¹⁷ For the raw values, the longer listing age and larger size of the post-merger client observations reflect the sequential nature of data (pre-merger data predate the post-merger ones) and the growth of client firms over time. We also observe that post-merger observations have significantly lower current ratio and *ROA*, higher leverage, and more volatile stock returns. This holds for both groups. However, for the percentile ranks, we find no significant difference in the MULTI group between the pre- and the post-merger data, except the *AGE* variable. Since the rank variables are based on the population of listed companies, the difference in the raw values between two periods is mainly due to a general change occurring across the board for all listed firms in China, rather than the financial deterioration specific to the sample clients. In any event, these variables are included in the regressions to control for possible impacts on audit opinions. Moreover, we analyze both the MULTI and the SINGLE samples. As the time period of these two samples largely overlaps, if there is a problem of omitting some time-varying variables that correlate with audit reporting, the problem should manifest in both groups. However, as explained later, we find no significant change in audit opinions after mergers for the SINGLE group.¹⁸

[Insert Table 3 here]

Equation (8) is estimated for the MULTI and SINGLE groups separately and the results are presented in Table 4. Since we use panel data, the regression standard errors could be biased if the residuals are correlated time-serially or cross-sectionally. In the spirit of Petersen (2008), we report the Z-statistics based on robust standard errors clustered by client firms. For the MULTI group, the coefficient on *POST* is significantly positive ($p < 0.01$). This suggests that, *ceteris paribus*, auditors in this group are more likely to modify audit opinions after mergers. To evaluate the economic significance, we set all the variables except *POST* at sample mean and change *POST* from zero to one. Such a change would increase the probability of issuing MAOs by 5.21% (from 8.48% to 13.69%).

In contrast, the coefficient on *POST* is not significant in the SINGLE group. When setting all variables except *POST* at the mean values for this sample, a shift from pre- to post-merger period will change auditors' probability to issue MAOs by only 0.92% (from 8.89% to 9.81%). Thus, we can reject H1, but not H2. This supports our argument that improvement in independence after mergers should only be observed in the multi-license group. The coefficients on most of the control variables have the predicted signs, although some have unexpected signs (but not significant).

[Insert Table 4 here]

5.3 Sensitivity tests

We perform several sensitivity tests to check the robustness of our findings. First, to be sure that individual merger cases do not drive the results, we re-estimated equation (8) dropping each merger case one at a time. As there are 21 (38) cases in the MULTI (SINGLE) sample, equation (8) is re-estimated 21 (38) times. For the MULTI sample, the coefficient of *POST* is always significantly positive at the 0.05 or better levels (results not tabulated). In contrast, this coefficient is never significant at any conventional level for the SINGLE sample. Therefore, the main findings of this study are not unique to individual cases.

Second, the dichotomous *MAO* variable does not differentiate various types of MAOs. Since different types of MAOs may reflect auditors' judgment on the fairness of clients' financial statements, we also re-define the dependent variable as an ordered-level variable, which is coded from 0 to 4 for clean, unqualified but with explanatory notes, qualified, disclaimed, and adverse

opinions, respectively. The ordered Logit regressions yield results qualitatively the same as those reported. Some may argue that unqualified audit reports with explanatory notes are not an MAO. However, excluding this type of audit reports from our sample does not affect our conclusion.

Third, in our sample selection, we require that clients should be audited by the same CPA firm in both pre- and post-merger years so that the pre- and post-merger comparison is based on the same client portfolios. This may introduce some selection bias if mergers affect the audit firms' selection of clients or clients' choices over auditors. We therefore construct an alternative sample without such a requirement. This sample includes all clients firms audited by the merging CPA firms from years -3 to 0. The Logit regression results based on this alternative sample are qualitative the same: the *POST* variable is significantly positive ($Z = 2.602$) for the MULTI sample and remains to be insignificantly different from zero ($Z = 0.613$) for the SINGLE sample.

6. Further analyses

6.1 The clustering of mergers in calendar time

Our design is to compare the audit reporting decision of the merging CPA firms between the pre- and the post-merger periods. If there is no systematical time-series change in P_{detect} , α , and other factors that affect auditor decision making, the change in audit quality can be attributed to the audit firm mergers. However, a substantial number of observations have year 0 in 2000 (see Panel A, Table 1). As the clustering in calendar time may not randomize the effects of these factors, it could be that the changes we observe for our test sample is an artifact of a more general change occurring across the board for all firms. To examine the potential confounding effect of time period, we compare our experimental sample with a control sample over the same period.

Specifically, we match the CPA firms in our experimental sample (firms that merged) with those that do not undergo mergers during our sample period by year. We require that between experimental and control CPA firms, the absolute difference in total client assets audited at the end of year -1 does not exceed 20%. By these criteria, we have 20 non-merger control CPA firms matched with 20 pre-merger CPA firms in the MULTI group. The difference between the experimental and the control CPA firms in total client assets audited at the end of year -1 is not significant ($t = -0.89$). Similar to the sample selection criteria described in section 4, we selected

748 client firm-years audited by the control CPA firms from year -3 to 0. These observations are pooled with 680 client firm-years of the experimental sample and the following Logit model is estimated:

$$\begin{aligned}
 MAO = & \alpha_0 + \alpha_1 EXP + \beta_0 POST + \beta_1 EXP \times POST & (9) \\
 & + \gamma_1 CURRENT + \gamma_2 ARINV + \gamma_3 LEV + \gamma_4 TURN + \gamma_5 ROA + \gamma_6 LOSS \\
 & + \gamma_7 AGE + \gamma_8 EM + \gamma_9 RET + \gamma_{10} STDR + \gamma_{11} Ln(TAST) + \varepsilon,
 \end{aligned}$$

where *EXP* equals to one if the observation is audited by the experimental CPA firms, and zero otherwise, and other variables are defined as before. In this model, the coefficient on *EXP* measures the pre-merger difference between the experimental and the control CPA firms in their propensity to issue MAOs. The coefficient on *POST* estimates the general change in this propensity across the experimental and the control CPA firms during the post-merger period. The post-merger change in the issuance of MAOs specific to the experimental CPA firms is captured by the interaction term *EXP*×*POST*.¹⁹

Column (1) of Table 5 reports the results for equation (9) for the MULTI group. The coefficient on *EXP* is not significantly different from zero. Therefore, auditors in the experimental CPA firms are similar to their peers in the control sample in issuing MAOs before mergers. The coefficient on *POST* is not significant either. Thus, there is no evidence suggesting a general change in issuing MAOs across the control and the experimental samples in the year 0. However, the coefficient on *EXP*×*POST* is significantly positive ($p < 0.01$). This suggests that, other things being equal, auditors in our experimental sample are more likely to issue MAOs than auditors in the non-merger control audit firms in the merger year (i.e., year 0). Additionally, the sum of *POST* and *EXP*×*POST* is positive and significant at the 0.01 level, indicating post-merger propensity of MAOs in the MULTI sample is higher than that before mergers. Therefore, our findings are not time-period specific results.

[Insert Table 5 here]

By the same method, we create a control sample of 27 non-merger CPA firms for the SINGLE group. The difference in total client assets audited at the end of year -1 between the SINGLE group and the control sample is not significant ($t = -1.24$). The estimates of equation (9) for the SINGLE group and its control sample are reported in Column (2) of Table 5. Auditors in

the SINGLE group are not different from their matched peers in issuing MAOs before or after mergers, as neither the *EXP* nor the *EXP×POST* variable is significantly different from zero. Moreover, *POST + EXP×POST* is not significantly different from zero. We thus find no evidence suggesting post-merger change in the propensity of issuing MAOs for the SINGLE group auditors.

In the above analysis, we use total client assets audited by the audit firms as the matching criterion. The results are not sensitive to the use of number of listed clients as an alternative audit firm size measure. We also perform the analyses by partitioning the merger cases into two sub-samples: those in 2000 and those in other years. Untabulated results indicate that, for the MULTI type mergers, the variable of *POST* is significantly positive in both sub-samples. Again, *POST* is not significant for the SINGLE type mergers in either sub-sample. Collectively, the results do not indicate that the increase in the propensity of issuing MAOs is due to some systematic factors that affect all auditors in year 2000. Recall that the absolute difference in listed clientele between the merging CPA firms and their control firms cannot exceed 20% in matching. This procedure reduces the sample size (for example, *n* is reduced from 1,047 in Table 4 to 680 in Table 5 for the MULTI sample). Therefore, in subsequent analyses, we keep the original sample, which should be more representative of the population.

6.2 Possible selection bias caused by audit firms' merger decisions

Our investigation of the difference in audit quality before and after mergers for the same set of clients avoids the selection bias caused by clients' auditor choice. However, it could be that audit firms choosing the MULTI type mergers are inherently different from those in the SINGLE group, which leads to the different effects of mergers on audit quality. Although the descriptive statistics in Table 1 reveal no systematic difference in major characteristics between the SINGLE and MULTI groups, we adopt the matched propensity approach suggested by Francis and Lennox (2008) to further address this issue. Specifically, we first estimate a Logit model to predict the propensity for audit firms to choose the MULTI type mergers. For each MULTI type audit firm, we identify a SINGLE type audit firm that has the closest predicted probability as match. Finally, we estimate a regression to examine whether the MULTI firms are more likely to issue MAOs after mergers than their matched SINGLE firms. This approach controls the possible selectivity

by aligning the distribution of observed characteristics within the matched MULTI and SINGLE samples.²⁰

To predict the merger types chosen by the audit firms, we estimate the following Logit model using pre-merger audit firms as unit of analysis:

$$MULTI = \alpha + \beta_1 Legal + \beta_2 Beijing + \beta_3 Shanghai + \beta_4 BigN + \beta_5 \sum Ln(TAST) + \beta_6 AGE + \beta_7 F_Score + v, \quad (10)$$

where *MULTI* is equal to 1 if the merger type is a multi-license one, and 0 otherwise. We include the following independent variables, all measured at the beginning of merger year, to predict the types of audit firm mergers. *Legal*, *Beijing*, and *Shanghai* are three region-specific variables.

Legal is Fan and Wang's (2004) legal environment index for the region where the merging audit firm locates, with higher index meaning a better legal environment. As listed clients and CPA firms serving such clients are more likely to cluster in a legally mature environment, audit firms are more likely to consummate the MULTI-type mergers in regions with higher *Legal* index. We note that there are relatively more merging firms located in Beijing and Shanghai, the two most important metropolitans in China. Two dummy variables, *Beijing* and *Shanghai*, for audit firm located in these two cities are included to examine whether Beijing and Shanghai audit firms differ from others in their merger decisions. We then include several audit firm characteristics variables. *BigN* is a dummy indicating the observations is one of the Big N firms. To protect themselves on audit risks, Big N are more likely to choose quality partners. Given their power, they are also more likely to attract quality firms to merge with them. If the average quality of licensed audit firms is higher, Big N firms are more likely to be in the MULTI group. $\sum Ln(TAST)$ is the sum of logged clients' total assets and *Age* is the number of years the audit firm performs audit services to listed companies. Large, mature firms could have their own practice philosophy and may not find other compatible licensed firms to merge with. *F_Score* is the mean value of clients' first factor score from the factor analysis of the variables that may affect audit reports (i.e., the variables in Table 3), with higher score representing better financial position. It is more difficult for firms with risky client portfolios to merge with other licensed firms since the high audit risk of such clients could jeopardize the career of the incoming partners.

Panel A of Table 6 presents the prediction model results. The results reveal that audit firms

operating in better legal environment are more likely to choose the MULTI type mergers. The coefficient on *Beijing* is significantly negative at the 5% level, while that on *Shanghai* is not significant.²¹ The coefficient signs of the audit firm characteristics variables are all consistent with our conjecture with the exception of the *Age* variable.²²

[Insert Table 6 here]

Following Francis and Lennox (2008), we sort the sample audit firms by the estimated probability obtained from the prediction model and implement the following rules to match the MULTI audit firms with the SINGLE ones: (1) if only one of the two firms adjacent to a MULTI audit firm is a SINGLE audit firm, it is chosen as the match; (2) if both adjacent firms belong to the SINGLE group, we choose the one with closest estimated probability; and (3) if there is no SINGLE audit firm adjacent to a MULTI audit firm, it is dropped. We are able to identify 27 pairs of audit firms. With the paired difference between two groups in the estimated probability being lower than 0.01%, the probability distribution of the MULTI audit firms is close enough to their SINGLE matches to mitigate the selectivity. To examine whether the post-merger change in the propensity to issue MAOs differs between the two groups, we pool the client firm-years audited by the MULTI and the matched SINGLE samples and estimate the following model:

$$\begin{aligned}
 MAO = & \alpha_0 + \alpha_1 SINGLE + \beta_0 POST + \beta_1 SINGLE \times POST & (11) \\
 & + \gamma_1 CURRENT + \gamma_2 ARINV + \gamma_3 LEV + \gamma_4 TURN + \gamma_5 ROA + \gamma_6 LOSS \\
 & + \gamma_7 AGE + \gamma_8 EM + \gamma_9 RET + \gamma_{10} STDR + \gamma_{11} Ln(TAST) + \varepsilon,
 \end{aligned}$$

where *SINGLE* is a dummy variable indicating that the audit firm selects SINGLE type merger, and all other independent variables are defined as before. In this model, the coefficient on *SINGLE* captures the difference between the SINGLE and the MULTI groups in their propensity to issue MAOs before mergers. Post-merger change in the likelihood of MAOs in the MULTI group is reflected in the *POST* coefficient, and such a change for the SINGLE group is measured by the sum of coefficients on *POST* and *SINGLE*×*POST*.

Model (11) results are reported in Panel B of Table 6. After correcting the selection bias, the conclusion is qualitative the same as before: the significantly positive coefficient on *POST* indicates that the MUTLI group issues more MAOs after mergers; *SINGLE*×*POST* is significantly negative ($p < 0.10$) and the sum of coefficients on *POST* and *SINGLE*×*POST* is not

significantly different from zero in the χ^2 statistics, which means that there is no significant post-merger change in the propensity for MAOs in the matched SINGLE group. Therefore, it does not appear that there is any selection bias that affects our results.

Using the full sample, we also apply the Heckman method by including the inverse Mills ratio estimated from the choice model [i.e., model (10)] in model (11). The results are qualitative the same as those in Table 6. Also, the multicollinearity problem is not a concern as the VIF statistics in model (11) are all below 4.

6.3 Alternative explanations

In the prior section, we show that auditors in the MULTI group are more likely to issue MAOs after mergers, while those in the SINGLE group are not. Given the different impacts of the two types of mergers on CPA firms' listed clients and thus quasi rents at stake, the evidence lends support to the theory that auditor independence is positively related to quasi rents at stake. From the auditor expertise literature, mergers should have little *immediate* effect on auditor competence. Moreover, if competence does change immediately, both the SINGLE and MULTI groups should show post-merger improvement in audit quality.²³ We further analyze the competence issue in the following.

Some cases in the MULTI group involve Big Ns' member firms in China. If the Big N auditors are more competent due to better training, auditors in the non-Big N firms could be more competent after they merge with Big N.²⁴ To verify whether mergers with Big N firms are driving the results for the MULTI sample, we exclude two cases involving Big N (AA and DTT) from the sample. Column (1) of Table 7 reports the results without these cases. The results are qualitatively the same as those reported before.

[Insert Table 7 here]

Since we argue that improvement in audit quality in year 0 is primarily due to changes in independence rather than competence after mergers, it is interesting to examine whether different pre-merger audit firms jointly audit the same client after mergers. Intuitively, joint audits could allow auditors to share their expertise and thus improve the overall competence of the merged firms. In China, audit reports for listed companies should be signed by at least two individual CPAs who perform audits for the clients. If there is any joint audit in year 0, then the audit reports

should be signed by CPAs from different pre-merger audit firms. We examine the audit reports and find 21 such joint audit cases out of 293 observations in year 0 in the MULTI sample. Column (2) of Table 7 reports the results based on the sample excluding pre- and post-merger observations that belonged to client firms jointly audited by different pre-merger audit firms in year 0. The tenor of our results is not changed after excluding these observations. Therefore, the potential improvement in competence immediately after mergers does not explain the post-merger improvement in audit quality.

Another possibility that may confound the significant audit quality improvement after merger in the MULTI group is that independence may improve through channels other than the size of quasi rents at stake. Chan et al. (2006) and Wang et al. (2008) find that Chinese auditor locality affects their reporting decision. Due to the political influence of local governments, auditors report more favorably when the auditors and client firms are located in the same regions (province or equivalent in China), as compared to the non-local clients. Mergers between CPA firms may change the relative locality of clients. For example, a Beijing firm merges with a Shanghai firm and administers audits of clients that are previously audited by the Shanghai firm. In such cases, the merged firm could be more independent since the Shanghai government is less able to intervene in the audits performed by the Beijing auditors. It is thus possible that independence improvement is caused by a change in locality rather than quasi rents at stake. To alleviate this concern, we split the sample into two sub-samples: one for mergers within the same region, and the other for mergers across different regions. The results for these two sub-samples for the MULTI group are reported in Columns (3) and (4), respectively, of Table 7. The *POST* variable takes a significantly positive coefficient in both sub-samples. Hence, the possible impacts of the locality change caused by mergers do not fully explain our findings.²⁵

6.4 The magnitude of mergers' impacts and post-merger audit quality improvement

The previous analysis suggests that MULTI type mergers have a more significant impact on post-merger audits than the SINGLE type. This supports DeAngelo's (1981) theory since the former leads to a larger increase in quasi rents at stake than the latter. In this section, we investigate whether the change in audit quality after the MULTI mergers varies with the magnitude of mergers' impact on audit firm's quasi rents at stake. Such evidence would lend

further support to the quasi rent theory. The following two hypothetical cases illustrate how the impact of mergers can differ across firms.

Case I: The pre-merger firm A has 5 listed clients and the pre-merger firm B has 15 listed clients. The post-merger firm, AB, has 20 clients.

Case II: The pre-merger firms A* and B* have 10 listed clients each. The post-merger firm, A*B*, has 20 clients.

Although all firms experience an increase in clients after mergers, the impacts are quite different: in Case I, the increase in the number of listed clients is 15 and 5, for A and B, respectively, while the increase is 10 for both A* and B* in Case II. Accordingly, the strength of the post-merger change in audit quality is the greatest for A, followed by A*/B*, and B. To capture the strength of the merger, we define the relative size of an audit firm in a merger as:

$$RELSIZE_i = \frac{Size_{i,-1}}{\sum_{i=1}^n Size_{i,-1}}, \quad (12)$$

where $Size_{i,-1}$ is the size of listed clientele for audit firm i at the end of year -1, and $\sum_{i=1}^n Size_{i,-1}$ is the sum of listed clientele for n audit firms participating in a merger.²⁶ Since a larger value in $RELSIZE_i$ means a relatively smaller change in audit firm size after mergers for audit firm i , we predict a *negative* relation between the post-merger change in audit quality and $RELSIZE_i$. An interaction term, $POST \times RELSIZE$, is added to the regression model to test this prediction.

We use the continuous form of $RELSIZE$ as well as its tercile ranks (from 0 to 2 and then divided by 2), which is less subject to the outlier problem and the linearity assumption. The results are reported in Panel A of Table 8, where Columns (1) and (2) are based on continuous and rank specifications, respectively. In both columns, $POST$ is significantly positive and $POST \times RELSIZE$ is significantly negative. Therefore, the post-merger increase in the probability of MAOs decreases with $RELSIZE$, i.e., the larger the audit firm before the mergers, the smaller will be the post-merger improvement in audit quality. To determine the economic significance, we set all the variables at sample mean and $POST$ at 1, and then change the value of $RELSIZE$. For the continuous specification, when $RELSIZE$ is at its first quartile (0.364), the post-merger probability of issuing MAOs is 15.02%; and when setting $RELSIZE$ at the third quartile (0.660),

this probability decreases to 9.60%. Similarly, for the rank specification, moving from the bottom- to middle- and then to top-tercile of *RELSIZE* (i.e., the variable is changed from 0, to 0.5, and 1) is associated with a decrease in this probability from 17.99%, to 13.27%, and to 9.64%. Given that the base probability of MAOs is 8.48% before merger (see Section 5.2), the *RELSIZE* variable does cause economically significant variation in the post-merger MAO probability change.

In Panel B of Table 8, we use total listed clientele assets audited by the firm as an alternative size measure. The results are even stronger in statistical sense and our conclusion remains the same. Taken together, the results in Table 8 suggest that in the *MULIT* group the change depends on the magnitude of the change in firm size due to mergers. This finding provides additional support to the DeAngelo (1980) theory.

[Insert Table 8 here]

7. Summary and conclusion

Studies on audit quality typically compare the difference between Big N and non-Big N and find that the audit quality of Big N is higher than that of non-Big N. However, DeAngelo's (1981) proposition that large auditors are more independent due to more aggregate quasi rents serving as collateral against malfeasance is subject to alternative explanations, including the difference in auditors' competence between large and small auditors, the incentives for Big N to protect their brand names, and the potential self-selection problem in the data. By examining the difference in audit quality between the pre- and the post-merger audit firms in China, we have a better control for these confounding effects. We hypothesize that auditors are more independent subsequent to mergers *only* when mergers increase their quasi rents at stake. Since the *SINGLE* mergers (where a licensed CPA firm merges with non-licensed ones) have little impact on auditors' aggregate quasi rents at stake, we argue that the improvement of independence should be more evident in *MULTI* mergers (involving at least two CPA firms licensed to audit listed companies).

Consistent with the above argument, we find that audit firms involved in *MULTI* mergers are more likely to issue MAOs to clients after mergers. Also, the increased propensity for MAOs is significantly related to change in audit firm size after mergers. In contrast, there is no evidence

suggesting any significant change in the issuance of MAOs for audit firms involved in SINGLE mergers. Given that the two groups of CPA firms are comparable prior to mergers and similar in size (in terms of annual total revenues) after mergers, the different effects of mergers on audit quality support the theory that auditor independence is a positive function of aggregate quasi rents at stake.

While the wave of CPA firm mergers in China was at least partly orchestrated by the government, more than half of the mergers (i.e., the SINGLE group) do not result in any apparent improvement in audit quality. One policy implication is that simply increasing audit firm size *per se* (e.g., increase the number of auditors or audit firm revenues, as the new regulations stipulated) does not enhance auditors' independence. The level of independence and thus audit quality is determined by auditors' trade-off between the costs and benefits of opportunistic behavior. Although we show that there is a significant change in auditor independence for the multi-license type of mergers, the evidence does not necessarily imply that the overall post-merger audit quality in China has reached a socially optimal level in protecting investors. Experience from mature markets suggests that, in addition to public enforcement by regulators, other mechanisms such as private litigation against auditors, the market demand for auditor reputation and improved disclosures on audit services should be helpful in a well-functioning audit market. These mechanisms, however, are not yet very effective in China's audit market. To further foster auditor independence, it should be useful for Chinese regulators to consider these additional mechanisms as well as other social costs involved.

Endnotes

¹ Some researchers have noticed this issue (cf. Deis and Giroux 1992, 464; Jeter and Shaw 1995, 314).

² For example, contrary to the theory that risky firms would select high quality auditors to maximize firm value when going public (Datar, Feltham, and Hughes 1991), Feltham, Hughes, and Simunic (1991) report that U.S. IPO clients of the Big N are less risky than those of the non-Big N. They conjecture that this might be due to self-selection since U.S. Big N tend to avoid risky clients and the potential litigation losses. This conjecture is confirmed by Clarkson and Simunic (1994) using data from Canada, where the auditor litigation costs are lower and the self-selection problem is less serious.

³ We define risk to auditors as the probability of auditor's opportunistic behavior being detected. Moreover, the detection affects the utility of the auditors negatively (e.g., law suits, regulatory sanctions, and the loss of market share due to tarnished reputation).

⁴ As early as 1988, the Big 8 already audited 96.6% and 84.5% of the firms listed in NYSE and AMEX, respectively (Wootton, Tonge, and Wolk, 1994). At the end of 1999, the market share of Big Ns' member firms in China is only about 3.6% (11.9%) in terms of the number of listed clients (listed clients' total assets). This figure grows to 6.93% (41.39%) by the end of 2006.

⁵ In the 1990s, international accounting firms had only indirect involvement in China's audit market. For example, they can joint-venture with domestic CPA firms. They can also invest in domestic firms since 1999. China grants Sino-foreign joint ventures, including the international accounting firms, a period of up to five years of income tax exemptions and reductions.

⁶ The supply of qualified CPAs in China is not likely to increase significantly in the short term since the pass rate for professional examinations for audits of listed companies has been quite low. In 2001, 11,307 CPAs took the examination and only 150 passed.

⁷ The analysis can be extended to mergers involving more than two audit firms without loss of generality. While we only analyze the situation where client c is audited by A before merger, the result can also apply to a client originally audited by B .

⁸ Healy, Palepu, and Ruback (1992) report that post-merger improvement in productivity is particularly strong for firms with highly overlapping businesses. Researchers also find that increase in profitability after mergers is associated with lower costs of goods sold in industrial firms (Fee and Thomas 2004) or reduced operating expenses in banking service businesses (Houston, James, and Ryngaert 2001).

⁹ Merger could also affect quasi rents in that clients may switch audit firms after merger if merger results in the client's competitor being served by the same audit firm and thus the possible leakage of proprietary information to the competitor. However, a GAO survey suggests that 92% of large U.S. public companies still choose an audit firm when the firm also audits their competitors (Krishnan 2005). Similarly, for our sample firms, the

market share per audit firm measured by total client assets audited stays basically unchanged immediately after mergers.

¹⁰ There are also mergers where the mergees are all non-licensed CPA firms. As the clients of such non-licensed firms are not listed, data for this type of merger are not publicly available.

¹¹ The clustering of mergers in calendar time is consistent with Harford's (2005) theory that merger activities are firms' rational response to the new environment, such as economic, regulatory, and technological shocks.

¹² Ideally, the comparison should be between 1999 and 2000. However, to the best of our knowledge, data for years 2000 and 2001 are not publicly available.

¹³ Analysis based on median values and Wilcoxon rank sum tests for Panels B, C and D in Table 1 shows a pattern similar to that based on mean values.

¹⁴ Chen, Su, and Zhao (2000) report that the related monetary amounts in some cases of unqualified opinion with explanatory notes were much larger than the adjustment amounts in some qualified audit reports. The CSRC also treats unqualified opinion with explanatory notes opinion the same as qualified opinion in disclosure requirements.

¹⁵ Using data from 1995 to 1997, Chen et al. (2001) report that a similar reason for MAOs is firms' earnings management to meet the profitability requirement specified by CSRC in 1996 for rights offerings. We attempted to include a dummy variable defined in a way that reflects the rule for rights offerings. However, it is not significant. This is probably because the rights offerings rule subsequently enacted in 1999 has lowered such earnings management incentives for Chinese firms (Haw, Qi, Wu, and Wu 2005).

¹⁶ We estimate the market model by regressing individual stock returns on market return, using weekly stock return data during the fiscal year.

¹⁷ The results are similar for the median values and Wilcoxon tests.

¹⁸ In Section 6, we match the merger audit firms with non-merger ones by audit firm size and time, and examine whether the post-merger change in audit reporting is specific to the merger firms. Since the merger sample and their matches are drawn from the same time period, the results from the match design are even less likely to be affected by the correlated-but-omitted variable problem.

¹⁹ Note that some variables are significantly different between the pre- and post-merger periods in Table 3. Untabulated analysis suggests that the differences in these variables between the experimental and their controls are not significant in either the pre- or the post-merger periods, except that the experimental clients of the SINGLE group have higher leverage than their controls in both the pre- and the post-merger periods. This will not create any problem since we are comparing audit in the pre-merger period with that of the post-merger period and since we have a control variable for leverage when comparing the experimental clients with their controls.

²⁰ Compared with the traditional Heckman (1979) method, the matched propensity method has the following

merits: (1) it relaxes the “exclusion restrictions” requirement (i.e., some independent variables in the first-stage choice model should be truly exogenous and excluded from the second-stage analysis), which is often overlooked by researchers; (2) it is not subject to the multicollinearity problem due to the inclusion of inverse Mills ratio in the second-stage analysis; and (3) empirical results are not sensitive to the model specifications in the first- or the second-stage and are thus more robust (Francis and Lennox 2008).

²¹ Beijing has the highest per capita accountants in China (Fan and Wang 2004). And all main accounting regulatory agencies, the CSRC, MOF, and CICPA, are in Beijing. It may be particularly attractive for a non-Beijing *licensed* audit firm to merge with a Beijing *non-licensed* firm when entering the Beijing market to facilitate its development. This increases the likelihood of SINGLE mergers occurring in Beijing.

²² In model (10), we also consider other variables proxy for regional development, such as government intervention, credit market development, or the overall marketization. These variables are not significant. We also consider alternative audit firm size measures, such as the number of listed clients, the number of CPAs who sign on the audit reports, or various market share variables (i.e., the size variables deflated by the total market size). Results based on these alternative measures are similar to those reported.

²³ Note that licensed CPA firms in the SINGLE group merge with non-licensed ones. If the expertise of non-licensed CPAs tends to differ from and thus complement that of licensed CPAs, auditors in the SINGLE mergers are more likely to improve their competence. However, we find no such evidence.

²⁴ Alternatively, Big N firms have stronger incentives to promote independence of the non-Big N firm merged with them in order to protect their internationally established brand names.

²⁵ In the SINGLE sample, there is one case involving a Big N firm (EY). Excluding this case does not change the insignificant result for the *POST* variable. For this type of mergers, we cannot identify joint audits by different pre-merger audit firms in year 0 since the identities of auditors from non-license CPA firms are not publicly available in the pre-merger years. We also partition the SINGLE group into two sub-samples by the locality of merging audit firms. In neither sub-sample can we find more frequent MAOs after mergers.

²⁶ Hence, in Case I, $RELSIZE_i$ is 25% and 75% for A and B, respectively, and equals to 50% for both A* and B* in Case II. For our sample, $n = 2$ in most cases.

Appendix

Difference in audit fees between the pre- and the post-merger years

Prior research on the effect of mergers on audit pricing provides mixed evidence. Iyer and Iyer (1996) and Ivancevich and Zardkoohi (2000) do not find significant change in audit fees after mergers in the U.K. or U.S. audit markets. However, Firth and Lau (2004) and Lee (2005) document that audit fees increase after mergers in the Hong Kong market. In this appendix, we examine whether audit prices change around mergers for our sample firms.

Chinese listed firms have been required to disclose audit fees since 2001. As some firms also voluntarily disclose audit fees in the prior year, audit fee data are available for year 2000 onwards. For the 145 client firms whose auditor experience mergers between 2001 and 2006, 118 firms have complete audit fee data in both year -1 (pre-merger) and year 0 (post-merger). Following previous audit pricing research (e.g., Simunic, 1980), we regress the natural logarithm of audit fees on the following variables:

- $POST$ = 1, if the observation is from year 0, and 0 otherwise;
- $Ln(TAST)$ = The natural logarithm of total assets audited;
- $NSUB^{1/2}$ = Square root of the number of consolidated subsidiaries;
- $ARINV$ = The intensiveness of accounts receivables and inventory (sum of total receivables and inventory divided by total assets);
- ROA = Return on assets (earnings divided by total assets);
- $CURRENT$ = Current ratio (current assets divided by current liabilities); and
- LEV = Leverage ratio (liabilities divided by total assets).

The regression results are as follows:

$$Ln(Fee) = 4.910^{\ddagger} + 0.002 \times POST + 0.357^{\ddagger} \times Ln(TAST) + 0.143^{\ddagger} \times NSUB^{1/2} + 0.185 \times ARINV + 0.774^{\dagger} \times ROA + 0.039 \times CURRENT + 0.193 \times LEV + \epsilon.$$

$$R^2 = 51.4\%, N = 236, F\text{-value} = 36.53^{\ddagger}$$

(\dagger and \ddagger denote two-tailed significance at the 0.05 and 0.01 level, respectively.)

In the above regression, the coefficient on $POST$ is 0.002 ($t = 0.04$). This suggests that, *ceteris paribus*, audit fees after mergers increase by 0.2% ($= e^{0.002} - 1$). Such an increase is not statistically or economically significant. At least, the evidence does not support the view that auditors cut audit fees after mergers.

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TABLE 1

Descriptive statistics for CPA firm mergers in China

<i>Panel A: The distribution of mergers</i>									
Type of mergers	1999	2000	2001	2002	2003	2004	2005	2006	Total
MULTI	2	18	0	0	0	0	1	0	21
SINGLE	3	27	1	1	1	0	2	3	38

<i>Panel B: The mean number of CPA firms involved in mergers</i>			
Types of firms	MULTI group	SINGLE group	<i>t</i> -statistics
Licensed firms	2.18	1.00	11.06 ^{***}
Non-licensed firms	0.45	1.97	-3.85 ^{***}
Total	2.64	3.00	-0.93

<i>Panel C: Characteristics of listed clientele before and after mergers</i>			
Characteristics	MULTI group	SINGLE group	<i>t</i> -statistics
<i>Pre-merger (per firm before merger)</i>			
Mean number of listed clients	8.91	10.43	-0.87
Mean total assets audited (in billions yuan)	17.36	17.77	-0.08
Mean number of auditors signing audit reports	6.84	8.15	-1.23
<i>Post-merger (per merged firm after merger)</i>			
Mean number of listed clients	16.41	10.43	2.53 ^{**}
Mean total assets audited (in billions yuan)	36.87	20.95	1.83 [*]
Mean number of auditors signing audit reports	13.43	8.86	3.43 ^{***}

<i>Panel D: Growth in total annual revenues of CPA firms</i>			
Mean annual revenues (in millions yuan)	MULTI group	SINGLE group	<i>t</i> -statistics
Fiscal year 1999	13.15	11.91	0.26
Fiscal year 2002	29.60	31.94	-0.59

MULTI refers to multi-license mergers, where there are at least two constituent licensed CPA firms. SINGLE refers to single-license mergers, where there is only one licensed CPA firm involved in the mergers. The licensed firms are CPA firms that have a license to audit listed companies in China.

In Panel C, the pre-merger data are computed by the CPA firms' listed clients in the most recent year before mergers and post-merger data are computed by merged CPA firms' listed clients at the end of the merger year. Clients newly acquired in the merger year are not included in the post-merger data to improve the comparability of pre- and post-merger data on client characteristics.

In Panel D, the revenues of CPA firms are the total annual revenues, including those earned from listed clients and non-listed clients.

The *t*-statistics are from *t*-tests comparing the difference in mean values between the multi- and single-license sample firms.

^{*}, ^{**}, and ^{***} denote two-tailed significance at the 0.10, 0.05, and 0.01 level, respectively.

TABLE 2

Univariate analysis of auditors' reporting decisions

Panel A: MULTI group

	Pre-merger		Post-merger		Row total	
	(Year -3, -2, and -1)		(Year 0)			
Clean reports	86.34%	(651)	79.18%	(232)	84.34%	(883)
MAOs	13.66%	(103)	20.82%	(61)	15.66%	(164)
Column total	100.00%	(754)	100.00%	(293)	100.00%	(1,047)

$$\chi^2 = 8.185^{***}$$

Panel B: SINGLE group

	Pre-merger		Post-merger		Row total	
	(Year -3, -2, and -1)		(Year 0)			
Clean reports	85.42%	(797)	82.34%	(303)	84.55%	(1,100)
MAOs	14.58%	(136)	17.66%	(65)	15.45%	(201)
Column total	100.00%	(933)	100.00%	(368)	100.00%	(1,301)

$$\chi^2 = 1.925$$

MAOs include unqualified opinions with explanatory notes, qualified, disclaimed, and adverse opinions. Figures in parentheses are actual cell frequencies (i.e., number of clean reports, number of MAOs, etc.).

*** Significant at the 0.01 level.

TABLE 3

Mean value for independent variables used in multivariate Logit analysis

Panel A: MULTI group ($n = 754$ for Pre-merger period; $n = 293$ for Post-merger period)

Variables	Raw value			Scaled percentile ranks		
	Pre-merger	Post-merger	<i>t</i> -Statistics	Pre-merger	Post-merger	<i>t</i> -Statistics
<i>CURRENT</i>	1.956	1.730	2.56**	0.513	0.483	1.51
<i>ARINV</i>	0.376	0.358	1.36	0.499	0.508	-0.45
<i>LEV</i>	0.443	0.476	-2.62***	0.493	0.522	-1.42
<i>TURN</i>	0.530	0.520	0.43	0.512	0.509	0.13
<i>ROA</i>	0.050	0.035	3.46***	0.517	0.510	0.36
<i>LOSS</i>	0.070	0.092	-1.19	-	-	-
<i>AGE</i>	3.292	4.877	-10.36***	0.524	0.587	-3.26***
<i>EM</i>	0.042	0.058	-1.07	-	-	-
<i>RET</i>	-0.008	0.015	-0.89	0.505	0.513	-0.38
<i>STDR</i>	0.046	0.048	-1.86*	0.493	0.515	-1.11
<i>Ln(TAST)</i>	20.754	21.025	-4.51***	0.539	0.548	-0.45

Panel B: SINGLE group ($n = 933$ for Pre-merger period; $n = 368$ for Post-merger period)

Variables	Raw value			Scaled percentile ranks		
	Pre-merger	Post-merger	<i>t</i> -Statistics	Pre-merger	Post-merger	<i>t</i> -Statistics
<i>CURRENT</i>	1.849	1.645	2.61***	0.507	0.483	1.39
<i>ARINV</i>	0.358	0.348	0.87	0.497	0.522	-1.43
<i>LEV</i>	0.464	0.499	-2.83***	0.497	0.519	-1.24
<i>TURN</i>	0.526	0.505	0.85	0.496	0.484	0.65
<i>ROA</i>	0.037	0.022	3.29***	0.520	0.480	2.29**
<i>LOSS</i>	0.097	0.120	-1.23	-	-	-
<i>AGE</i>	3.905	5.438	-8.85***	0.485	0.547	-3.63***
<i>EM</i>	0.047	0.063	-1.13	-	-	-
<i>RET</i>	-0.026	0.006	-1.74*	0.482	0.515	-1.89*
<i>STDR</i>	0.043	0.046	-3.82***	0.475	0.512	-2.17**
<i>Ln(TAST)</i>	20.796	20.994	-3.61***	0.507	0.505	0.11

The table presents the mean of the raw values and the scaled percentile ranks for the control variables used in the regression analysis. The continuous variables are transformed into percentile ranks and the ranks (from 0 to 99) are scaled by 99. The ranking is based on the population in the CSMAR database by year.

CURRENT is current ratio (current assets divided by current liabilities); *ARINV* is accounts receivables and inventory intensiveness (sum of accounts receivables and inventory divided by total assets); *LEV* is leverage ratio (liabilities divided by total assets); *TURN* is turnover ratio (total sales divided by total assets); *ROA* is return on assets (earnings divided by total assets); *LOSS* is equal to 1 if client firm has reported a loss, and 0 otherwise; *AGE* is the number of years a company has been listed; *EM* is equal to 1 if client firm has reported a ROE between 0 and 1%, and 0 otherwise; *RET* is annual market adjusted stock returns; *STDR* is the standard deviation of residuals from the market model estimated by weekly return data during the year; *Ln(TAST)* is the natural logarithm of clients' total assets.

*, **, and *** denote the post-merger observations are different from the pre-merger ones in the *t*-test at the 0.10, 0.05, and 0.01 level, respectively.

TABLE 4

Multivariate Logit analysis of auditors' reporting decisions

Independent variables	(1)		(2)	
	MULTI group (<i>n</i> = 1,047)		SINGLE group (<i>n</i> = 1,301)	
	Coefficients	Z-Statistics	Coefficients	Z-Statistics
Intercept	-2.148	-2.652***	-3.077	-4.198***
<i>POST</i>	0.538	3.011***	0.109	0.672
<i>CURRENT</i>	-0.304	-0.462	0.481	0.755
<i>ARINV</i>	0.825	1.648*	1.031	2.024**
<i>LEV</i>	0.513	0.685	1.470	2.209**
<i>TURN</i>	-0.596	-1.288	-1.821	-4.560***
<i>ROA</i>	-2.281	-3.356***	-1.332	-2.261**
<i>LOSS</i>	0.544	1.556	1.145	3.560***
<i>AGE</i>	0.512	1.093	0.495	1.093
<i>EM</i>	0.534	1.430	0.063	0.176
<i>RET</i>	-0.757	-2.212***	-0.235	-0.725
<i>STDR</i>	1.566	3.558***	1.433	3.637***
<i>Ln(TAST)</i>	-0.019	-0.041	-0.247	-0.594
Wald χ^2	153.534***		205.839***	
Pseudo R ²	18.15%		20.42%	

The estimates are based on the Logit method. The dependent variable is *MAO*, which is equal to 1 if client firm receives a modified opinion and 0 otherwise. *POST* is a dummy variable indicating that the observations are from the post-merger period. All other independent variables are defined as in Table 3. The continuous variables have been transformed into cross-sectional percentile ranks and the ranks (from 0 to 99) are scaled by 99. The Z-statistics are based on robust standard errors clustered by client firms.

*, **, and *** denote two-tailed significance at the 0.10, 0.05, and 0.01 level, respectively.

TABLE 5

Auditors' reporting decisions for the experimental and control sample firms

Independent variables	(1) MULTI group (<i>n</i> = 1,428, including 680 experimental and 748 control firms)		(2) SINGLE group (<i>n</i> = 2,158, including 1,180 experimental and 978 control firms)	
	Coefficients	Z-Statistics	Coefficients	Z-Statistics
Intercept	-1.937	-2.823***	-2.669	-4.319***
<i>EXP</i>	0.139	0.573	0.063	0.315
<i>POST</i>	-0.391	-1.590	-0.111	-0.528
<i>EXP</i>×<i>POST</i>	1.061	3.277***	0.246	0.959
<i>CURRENT</i>	-0.465	-0.809	0.411	0.783
<i>ARINV</i>	0.616	1.349	0.813	2.034**
<i>LEV</i>	0.307	0.472	1.620	2.878***
<i>TURN</i>	-1.326	-3.038***	-1.394	-4.505***
<i>ROA</i>	-1.668	-2.677***	-1.494	-2.928***
<i>LOSS</i>	0.772	2.472**	1.121	4.237***
<i>AGE</i>	0.848	1.983**	0.672	1.741*
<i>EM</i>	0.609	1.843*	0.336	1.110
<i>RET</i>	-0.334	-1.218	-0.033	-0.132
<i>STDR</i>	1.205	3.497***	0.621	2.122**
<i>Ln(TAST)</i>	-0.261	-0.611	-0.739	-2.015
χ^2 for <i>POST</i> + <i>EXP</i> × <i>POST</i>		7.372***	0.459	
Wald χ^2		188.575***	326.961***	
Pseudo R ²		16.17%	18.70%	

The estimates are based on the Logit method. The dependent variable is *MAO*, a dummy variable indicating that client firm receives a modified opinion. The independent variables are defined as in Table 3. The Z-statistics are based on robust standard errors clustered by client firms.

The sample CPA firms are matched with those that do not merge during our sample period, by year and by total client assets audited at the end of year -1. The dummy variable *EXP* equals to one if the observation is audited by the experimental CPA firms, and zero otherwise. There are 680 and 748 client observations in the MULTI merger sample and its matched non-merger sample, respectively. For the SINGLE group, the number of observations for the merger and the matched non-merger sample is 1,180 and 978, respectively.

*, **, and *** denote two-tailed significance at the 0.10, 0.05, and 0.01 level, respectively.

TABLE 6

Analysis of selection bias caused by audit firms' merger decisions

<i>Panel A: Analysis of audit firm merger decisions (n = 81)</i>			<i>Panel B: Analysis of auditors' reporting decisions based on a propensity-matched sample (n = 1,229)</i>		
Variables	Coefficients	Asy. <i>t</i> -stat.	Variables	Coefficients	Z-Statistics
Intercept	-2.197	-1.333	Intercept	-3.349	-4.061 ^{***}
<i>Legal</i>	0.512	1.830 [*]	<i>SINGLE</i>	0.241	0.941
<i>Beijing</i>	-2.584	-2.461 ^{**}	<i>POST</i>	0.646	2.846^{***}
<i>Shanghai</i>	-0.262	-0.208	<i>SINGLE</i> × <i>POST</i>	-0.514	-1.702[*]
<i>BigN</i>	1.411	1.065	<i>CURRENT</i>	0.306	0.456
$\sum \text{Ln}(TAST)$	-0.003	-1.638	<i>ARINV</i>	0.641	1.357
<i>Age</i>	0.028	0.190	<i>LEV</i>	1.512	2.147 ^{**}
<i>F_Score</i>	-0.908	-1.564	<i>TURN</i>	-0.871	-1.955 [*]
Wald χ^2		15.28 ^{**}	<i>ROA</i>	-1.784	-2.704 ^{***}
Pseudo R ²		17.20%	<i>LOSS</i>	0.677	1.966 ^{**}
			<i>AGE</i>	0.831	1.771 [*]
			<i>EM</i>	0.262	0.764
			<i>RET</i>	-1.085	-3.220 ^{***}
			<i>STDR</i>	1.964	4.768 ^{***}
			<i>Ln(TAST)</i>	-0.192	-0.421
			χ^2 for		0.184
			<i>POST</i> + <i>SINGLE</i> × <i>POST</i>		
			Wald χ^2		184.77 ^{***}
			Pseudo R ²		19.63%

The estimates are based on the Logit method.

In Panel A, the sample includes 81 pre-merger audit firms. The dependent variable is *MULTI*, which is equal to 1 if the merger type is a multi-license one and 0 otherwise. *Legal* is the legal environment index from Fan and Wang (2004); *Beijing* is equal to 1 if the audit firm is located in Beijing and 0 otherwise; *Shanghai* is equal to 1 if the audit firm is located in Shanghai and 0 otherwise; *BigN* is equal to 1 for Big N audit firms and 0 otherwise; $\sum \text{Ln}(TAST)$ is the logged total assets audited; *Age* is the number of years the audit firm perform audit services to listed companies; *F_Score* is the mean value of clients' first factor score for the variables that may affect audit reports (i.e., the variables in Table 3). The independent variables are measured at the beginning of the merger year.

In Panel B, the sample consists of client-firm years for 27 *MULTI* audit firms and their *SINGLE* matches. The match is based on the propensity to select *MULTI* type mergers estimated in Panel A. The dependent variable is *MAO*, which is equal to 1 if client firm receives a modified opinion and 0 otherwise. *POST* is a dummy variable indicating that the observations are from the post-merger period; *SINGLE* is a dummy variable indicating that the audit firm selects *SINGLE* type merger; and all other independent variables are defined as in Table 3. The continuous variables have been transformed into cross-sectional percentile ranks and the ranks (from 0 to 99) are scaled by 99. The Z-statistics are based on robust standard errors clustered by client firms.

^{*}, ^{**}, and ^{***} denote two-tailed significance at the 0.10, 0.05, and 0.01 level, respectively.

TABLE 7

Tests of the alternative explanations for the MULTI group

Independent variables	(1) Excluding mergers involving Big N (n = 934)		(2) Excluding joint audit observations (n = 963)		(3) Mergers within the same region (n = 524)		(4) Mergers across different regions (n = 523)	
	Coefficients	Z-Statistics	Coefficients	Z-Statistics	Coefficients	Z-Statistics	Coefficients	Z-Statistics
	Intercept	-2.401	-2.820 ^{***}	-1.946	-2.285 ^{**}	-1.735	-1.506	-2.553
POST	0.502	2.703^{***}	0.556	3.074^{***}	0.572	2.334^{**}	0.603	2.251^{**}
<i>CURRENT</i>	-0.212	-0.307	-0.691	-1.007	-0.361	-0.400	0.590	0.571
<i>ARINV</i>	0.687	1.373	0.959	1.821 [*]	0.662	1.073	0.276	0.308
<i>LEV</i>	0.638	0.821	0.116	0.148	1.198	1.123	0.299	0.253
<i>TURN</i>	-0.562	-1.173	-0.475	-0.996	-0.692	-1.187	-0.663	-0.915
<i>ROA</i>	-2.148	-3.058 ^{***}	-2.282	-3.171 ^{***}	-1.641	-1.669 [*]	-3.697	-3.758 ^{***}
<i>LOSS</i>	0.495	1.394	0.554	1.548	1.018	1.920 [*]	-0.094	-0.185
<i>AGE</i>	0.696	1.437	0.588	1.226	0.107	0.167	0.600	0.846
<i>EM</i>	0.567	1.463	0.553	1.425	1.223	2.547 ^{**}	-0.101	-0.153
<i>RET</i>	-0.655	-1.843 [*]	-0.683	-1.936 [*]	-0.862	-1.697 [*]	-0.266	-0.580
<i>STDR</i>	1.503	3.262 ^{***}	1.505	3.331 ^{***}	1.779	2.953 ^{***}	1.267	1.783 [*]
<i>Ln(TAST)</i>	0.125	0.262	0.079	0.172	-0.973	-1.522	1.022	1.507
Wald χ^2	136.300 ^{***}		147.143 ^{***}		154.508 ^{***}		50.130 ^{***}	
Pseudo R ²	17.72%		18.95%		24.75%		12.34%	

The estimates are based on the Logit method. The dependent variable is *MAO*, a dummy variable indicating that client firm receives a modified opinion. The independent variables are defined as in Table 3. The Z-statistics are based on robust standard errors clustered by client firms.

In column (1), we report results based on a sample excluding merger cases involving Big N firms. In column (2), we drop observations belonged to client firms that were jointly audited by different pre-merger audit firms in year 0. In columns (3) and (4), we estimate the regression for merger cases within and across regions (province or equivalent in China) separately.

^{*}, ^{**}, and ^{***} denote two-tailed significance at the 0.10, 0.05, and 0.01 level, respectively.

TABLE 8

The magnitude of mergers' impacts and post-merger audit quality improvement

Independent variables	<i>Panel A: Measuring size by the number of listed clients</i>				<i>Panel B: Measuring size by the total listed clientele assets</i>			
	(1) Continuous specification		(2) Rank specification		(1) Continuous specification		(2) Rank specification	
	Coefficients	Z-Statistics	Coefficients	Z-Statistics	Coefficients	Z-Statistics	Coefficients	Z-Statistics
Intercept	-2.244	-2.703***	-2.218	-2.676***	-2.245	-2.702***	-2.296	-2.732***
POST	1.275	3.413***	0.860	3.730***	1.279	3.420***	1.032	4.165***
POST×RELSIZE	-1.723	-2.066**	-0.721	-1.839*	-1.735	-2.076**	-1.085	-2.472**
<i>CURRENT</i>	-0.250	-0.379	-0.257	-0.388	-0.249	-0.377	-0.237	-0.357
<i>ARINV</i>	0.804	1.612	0.797	1.596	0.805	1.612	0.801	1.601
<i>LEV</i>	0.571	0.753	0.557	0.735	0.572	0.753	0.561	0.737
<i>TURN</i>	-0.576	-1.240	-0.587	-1.257	-0.576	-1.241	-0.580	-1.243
<i>ROA</i>	-2.256	-3.337***	-2.246	-3.301***	-2.256	-3.339***	-2.216	-3.292***
<i>LOSS</i>	0.531	1.539	0.533	1.539	0.531	1.538	0.531	1.536
<i>AGE</i>	0.488	1.035	0.479	1.014	0.488	1.035	0.506	1.069
<i>EM</i>	0.541	1.427	0.549	1.449	0.542	1.428	0.538	1.427
<i>RET</i>	-0.800	-2.326**	-0.791	-2.288**	-0.800	-2.326**	-0.809	-2.342**
<i>STDR</i>	1.660	3.793***	1.648	3.723***	1.662	3.799***	1.718	3.911***
<i>Ln(TAST)</i>	0.005	0.010	0.003	0.006	0.003	0.007	0.010	0.023
Wald χ^2	154.574***		154.365***		154.612***		155.997***	
Pseudo R ²	18.49%		18.40%		18.49%		18.65%	

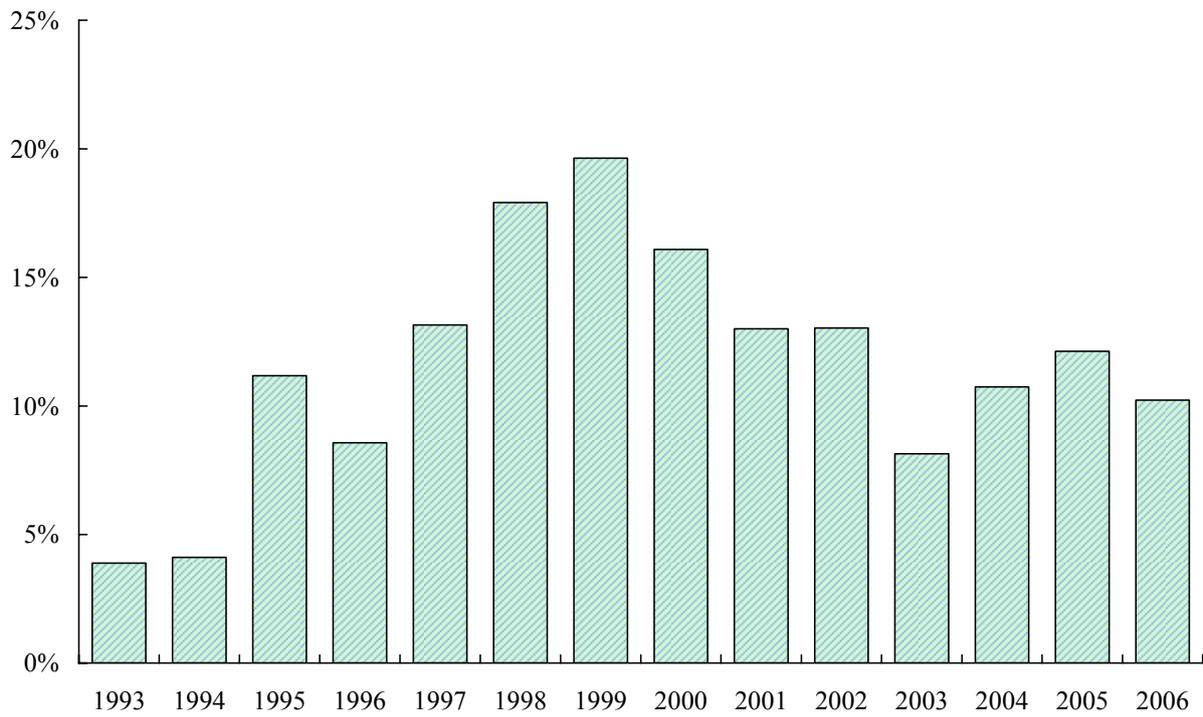
The estimates are based on the Logit method. The dependent variable is *MAO*, a dummy variable indicating that client firm receives a modified opinion. *RELSIZE* is defined as: $Size_{i,-1}/\sum Size_{i,-1}$, where $Size_{i,-1}$ is the size of audit firm i in year -1, and $\sum Size_{i,-1}$ is the sum of firm size for audit firms involved in a merger. Audit firm size is measured by the number of listed clients or the total assets of listed clientele (in logarithm form) audited by the firms. Other independent variables are defined as in Table 3. The Z-statistics are based on robust standard errors clustered by client firms.

For the continuous specification, *RELSIZE* is measured continuously. For the rank specification, *RELSIZE* is transformed to tercile ranks (from 0 to 2) and then divided by 2.

*, **, and *** denote two-tailed significance at the 0.10, 0.05, and 0.01 level, respectively.

FIGURE 1

Relative frequency of modified audit opinions for the population of Chinese listed firms from 1993 to 2006



The relative frequencies are calculated as the number of modified audit opinions (including unqualified with explanatory notes) divided by the total number of listed firms at the end of the respective year.