

The Effect of China's Weak Institutional Environment on the Quality of Big 4 Audits

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ABSTRACT: This study examines whether China's weak institutional environment results in lower-quality audits by the Big 4 firms. We find that the Big 4 assign their less experienced partners to companies that are listed only in China compared with clients cross-listed in Hong Kong. The Big 4 are less likely to issue modified audit reports, and they charge lower audit fees for clients that are listed only in China. Finally, companies listed only in China have larger signed abnormal accruals than do companies cross-listed in Hong Kong. Overall, we conclude that the weak institutional environment in China results in the Big 4 firms providing lower-quality audits to companies that are listed only in China.

Keywords: *audit quality; Big 4; China.*

I. INTRODUCTION

Economic theory predicts that firms have incentives to develop and sustain brand-name reputations for high-quality goods and services (Klein and Leffler 1981). In auditing, the brand-name firms are the Big 4, which have strong incentives to protect their global reputations. The Big 4 claim that they achieve a uniformly high level of quality around the world by giving their employees standardized training and through their global application of the same audit methodologies.¹ In addition, the Big 4 have active staff exchange programs between countries, with

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¹ For example, KPMG International's website states that: "Global capability and consistency are central to the way we work. By providing global organizations with the same quality of service and behavior around the world, we can work with them wherever they choose to operate" (see: <http://www.kpmg.com/Global/en/Pages/default.aspx>).

no significant competence differentials being observed when nationals from weak legal regimes are assigned to countries with strong regimes (Magnan 2008). On the other hand, it is unclear whether the Big 4 firms really do supply the same level of quality in countries where there is a lower likelihood that deficient audits will be detected and punished due to deficiencies in legal and regulatory systems. Therefore, it could be that the Big 4 supply lower-quality audits in countries with relatively weak institutional environments. In this paper, we directly test whether Big 4 firms supply the same level of audit quality across weak and strong institutional environments.

In international accounting, the traditional approach to testing this kind of research question involves measuring differences in country-level environments and then correlating these country characteristics with various outcomes, such as audit quality or financial reporting quality. However, this cross-country approach has serious limitations. First, the inferences are likely to suffer from correlated omitted variable problems due to unobserved differences between countries (Miller 2004; Gul 2006). For example, prior studies cannot fully control for cross-country differences in management integrity and corporate governance (Magnan 2008). To the extent that these omitted characteristics are different across institutional environments, prior studies' inferences about international differences in Big 4 quality could be erroneous. Second, the country-level characteristics are measured with error. For example, the literature often characterizes legal systems as being common law or code law, and yet Ball, Robin, and Wu (2003) show that this simple classification can be misleading. Moreover, country-level studies often have samples in which a small number of countries account for a disproportionately large number of observations. This means that small changes in the measurement of country-level variables or small changes in the sampling of countries can have a large impact on reported results (Miller 2004; Dong and Stettler 2011).

To mitigate these problems, we exploit unique features of the institutional setting in China. AH companies are mainland Chinese companies that have both A-shares listed in mainland China and H-shares listed in Hong Kong. AH companies are required to prepare two sets of financial statements, one for the A-shareholders and another for the H-shareholders, and both sets of financial statements must be audited. We compare the quality of the A-share audits of AH companies versus the quality of the A-share audits of companies that are not cross-listed in Hong Kong. This approach has two distinct advantages compared with prior international research in accounting.

First, our design is not confounded by unobserved country-level characteristics because all of the audits in our sample come from a single country. Rather than compare audit quality in China versus other jurisdictions, such as Hong Kong, we exploit variation in the strength of the institutional environment *within* mainland China by comparing the quality of the A-share audits of AH companies versus the quality of the A-share audits of Chinese companies that are not cross-listed in Hong Kong. The primary advantage of this research design is that all of the sample audits are conducted in mainland China. Therefore, our results are unlikely to be contaminated by unobservable differences in country characteristics.

Second, there exists a unique institutional feature of our setting that is important for the purposes of identification. In particular, AH companies are required to prepare two sets of financial statements. The H-share financial statements are audited by firms registered in Hong Kong, whereas the A-share financial statements are audited by firms in mainland China. This arrangement allows us to identify whether the H-share audit of the Hong Kong audit firm has a positive spillover effect on the A-share audit of the mainland Chinese audit firm. We expect a positive spillover because the involvement of Hong Kong Big 4 firms in H-share audits makes it more difficult for mainland Big 4 firms to compromise on quality in their A-share audits of AH companies. For example, it would be difficult for an auditor in mainland China to justify giving a clean audit opinion on an AH company's A-share financial statements if the same company has an auditor in Hong Kong who refuses to give a clean opinion on the H-share financial statements. Therefore, we hypothesize that

an A-share audit in mainland China is of higher quality when there is a Hong Kong audit of the same company's H-share financial statements.

We first investigate whether the Big 4 in mainland China assign their more experienced partners to clients that are exposed to this positive spillover from Hong Kong. We measure partner experience using a unique dataset from the Chinese Institute of Certified Public Accountants (CICPA). We predict that more experienced partners are assigned to the A-share audits of companies cross-listed in Hong Kong. Consistent with this, we find that the partners assigned to the A-share audits of AH companies are significantly more experienced compared with the partners who are assigned to the A-share audits of non-AH companies.

Next, we investigate whether Hong Kong's institutional environment has a positive spillover effect on the quality of audits by mainland auditors. Following prior research, we examine two audit-quality proxies, namely, audit opinions and audit fees. Consistent with the mainland Big 4 supplying lower-quality audits when they are not subject to the strong institutional environment of Hong Kong, we find that they are less likely to disclose problems in their audit reports and they charge lower audit fees.

Finally, higher-quality audits should lead to higher-quality financial reporting. Therefore, we investigate whether the A-share financial statements of AH companies are of higher quality compared with the A-share financial statements of non-AH companies. We examine signed abnormal accruals because high-quality auditing should mean that companies are less likely to report aggressively high earnings through their accrual choices. We find the quality of A-share financial reporting is lower in the absence of a positive spillover from Hong Kong.

We consider two alternative explanations for our findings. First, it might be argued that audit quality is higher for AH companies because they prepare two sets of audited financial statements that have to comply with dual accounting and auditing standards; i.e., the H-share financial statements are prepared for foreign investors, while the A-share financial statements are prepared for domestic Chinese investors. To control for this, our sample includes a control group of AB companies, which also prepare two sets of audited financial statements: the B-share financial statements for foreign investors and the A-share financial statements for domestic investors. The AH and AB companies are similar in that they are both subject to dual accounting and auditing standards, but they are different in that AB companies are listed only in mainland China, whereas AH companies are cross-listed in Hong Kong. Accordingly, we expect no positive spillover from Hong Kong for the A-share audits of AB companies, whereas we do expect this spillover for the A-share audits of AH companies. We find that our results are attributable to Hong Kong's strong institutional environment rather than to preparation of two sets of audited financial statements.

A second alternative explanation is that our results are attributable to inherent differences between companies cross-listed in Hong Kong and companies listed only in mainland China. Prior research finds that higher-quality companies self-select to cross-list in more demanding reporting and auditing environments (Doidge, Karolyi, Lins, Miller, and Stulz 2009). This could mean that the AH companies are inherently superior to the companies that choose not to cross-list in Hong Kong. While this might explain why the AH companies have higher-quality financial reporting, it is inconsistent with our other evidence that the AH companies are *more* likely to receive non-clean audit reports. In other words, it is hard to argue that the AH companies are inherently superior given that they have a higher frequency of non-clean audit opinions.

Our study contributes to the international accounting literature, where the standard methodology involves a comparison of financial reporting and auditing outcomes across countries with varying institutional environments. Our methodology is different because we exploit variation in the strength of the institutional environment within a single country and, therefore, avoid the problem of correlated omitted variables that plagues cross-country studies. However, we

acknowledge that our research setting also has a downside because the results for China may not necessarily generalize to other countries.

Our study is also different from the existing cross-listing literature because we examine a setting where cross-listed companies prepare two sets of audited financial statements. This allows us to test whether auditing is a channel through which cross-listing in a strong environment leads to higher-quality financial reporting.² While prior studies find that cross-listed companies have higher financial reporting quality than non-cross-listed companies (Lang, Raedy, and Yetman 2003), Leuz (2006, 298) notes that “the mechanism by which cross listings improve corporate behavior is not well understood.” Consistent with audit quality being one such mechanism, our results indicate that Hong Kong audits have a positive spillover effect on the audits of mainland Chinese auditors.

Additionally, this study takes a novel approach to examining the quality of Big 4 audits. The existing literature generally tests whether the Big 4 provide higher-quality audits relative to the quality provided by non-Big 4 auditors. That is, prior studies focus on the quality *differential* between the Big 4 and non-Big 4. Our study is distinguished by our focus on whether the Big 4 supply the same level of quality across different institutional environments. Benchmarking the Big 4 against the non-Big 4 would be problematic because we would then be unable to determine whether a quality differential is attributable to high Big 4 quality or low non-Big 4 quality. Our study avoids this problem by focusing exclusively on Big 4 audits.

Finally, our study contributes to an emerging literature that documents significant heterogeneities in quality across different audit offices within a country. Specifically, recent studies find that problematic audits—as measured by accounting restatements and auditor lawsuits—are largely clustered in certain low-quality offices (Francis and Yu 2009; Francis and Michas 2013; Lennox and Li 2014). We contribute by showing that heterogeneities in audit quality within mainland China can be explained by cross-listings in Hong Kong. In particular, the strong institutional environment of Hong Kong generates positive spillovers in the weak institutional environment of mainland China.

Next, Section II discusses the international literature on audit quality and the impact of a cross-listing on auditor behavior. Section III develops three hypotheses based on the argument that the strong institutional environment of Hong Kong has a positive spillover effect on audits in mainland China. Section IV presents the research designs for the models of: (1) audit partner experience, (2) audit opinions, (3) audit fees, and (4) abnormal accruals. Section V reports the main results, while Section VI reports tests for alternative explanations. Section VII concludes by discussing the study’s implications for U.S. regulators that are having difficulty monitoring the quality of audits in mainland China.

II. PRIOR LITERATURE

The Relative Quality of Big 4 and Non-Big 4 Audit Firms

Our study is related to two articles that examine the quality differential between Big 4 and non-Big 4 firms across different countries. Choi, Kim, Liu, and Simunic (2008) argue that a strong legal environment is more costly to auditors who supply low quality. Therefore, they predict that as the legal regime becomes tougher, the non-Big 4 increase their quality relative to that of the Big 4. In contrast, Francis and Wang (2008) argue that the Big 4 are more sensitive than the non-Big 4 to concerns about reputational impairment. Opposite to Choi et al. (2008), Francis and Wang (2008) find that the Big 4 enforce higher earnings quality as investor protection regimes become stronger.

² Prior studies have been unable to test this channel because they examine settings where cross-listed companies are not required to prepare two sets of audited financial statements.

Choi et al. (2008) and Francis and Wang (2008) use different quality metrics and reach opposite conclusions. Choi et al. (2008) use audit fees, whereas Francis and Wang (2008) use signed abnormal accruals. To ensure that the choice of quality metric does not alter our findings, we follow Choi et al. (2008) and Francis and Wang (2008) by examining both audit fees and signed abnormal accruals. To further triangulate our results, we investigate how Big 4 partners are assigned to clients and we examine their audit opinions. Moreover, our research question and design are different from Choi et al. (2008) and Francis and Wang (2008) because we investigate whether Big 4 quality is the same across different institutional environments. In contrast, Choi et al. (2008) and Francis and Wang (2008) examine the quality *differential* between Big 4 and non-Big 4 firms.

The Effect of a Cross-Listing on Audit Fees

Our study is related to two articles on the effect of a cross-listing on audit fees. Seetharaman, Gul, and Lynn (2002) find that U.K. auditors charge higher fees to clients that are cross-listed in the U.S. They argue that high fees compensate the auditor for the extra litigation risk that comes from auditing a company listed in the U.S. Choi, Kim, Liu, and Simunic (2009) examine how the cross-listing fee premium varies with the strength of the legal regime. They find that the premium increases with the strength of the legal regime. Our study is different because our objective is to test whether the Big 4 firms supply a uniform level of audit quality across different institutional environments. Another difference is that Seetharaman et al. (2002) and Choi et al. (2009) examine audit fees only. In contrast, we also examine audit firms' partner assignment decisions, auditors' reporting decisions, and financial reporting quality.

More importantly, there are alternative explanations for their finding that cross-listed companies pay higher audit fees (Bedard, Carson, and Simnett 2011). One explanation is that fees are higher because of the additional work that is needed to meet the host country's cross-listing requirements, such as the 20-F reconciliation. An alternative explanation is that audit fees are higher because auditors work harder when they are exposed to a stronger institutional environment. An important advantage of our setting is that the audit fee results are unlikely to be affected by the first explanation because we examine the fees of A-share audits, whereas the confounding effect of the additional work needed to meet Hong Kong's listing requirements is reflected in the fees paid for H-share audits. Moreover, any premium arising from the extra litigation risk in Hong Kong would affect the fees paid for H-share audits. We avoid these potential confounds because we examine the fees paid for A-share audits.

III. HYPOTHESIS DEVELOPMENT

In this section, we argue that Big 4 auditors are subject to a weaker institutional environment when their clients are listed only in China compared with when their clients are cross-listed in Hong Kong. Before presenting the hypotheses, we discuss the institutional arrangements for AH companies, pure A-share companies, and AB companies.

AH Companies

AH companies are mainland companies listed in both China and Hong Kong. They are under the supervision of four Hong Kong regulatory agencies: (1) Hong Kong Securities and Futures Commission (HKSF), (2) Hong Kong Stock Exchange (HKSE), (3) Hong Kong Institute of Certified Public Accountants (HKICPA), and (4) Independent Commission against Corruption (ICAC). Prior to 2010, the AH companies were required to prepare H-share financial statements audited by Hong Kong auditors and A-share financial statements audited by mainland auditors.

From 2010 onward, the AH companies are not required to prepare H-share financial statements, but the majority have continued to do so voluntarily.

The HKSFC and HKSE have legal powers to monitor and investigate the H-share audits of AH companies, although in practice, they usually refer suspected cases to the HKICPA for investigations and possible sanctions.³ Cross-listed mainland Chinese companies that have been censured by Hong Kong regulators include Cosco International (owned by the Chinese central government), Guangnan Holdings (owned by the provincial government of Guangdong), Asia Agricultural Holdings (a privately owned mainland company), and Global Trend Intelligent Technologies (a privately owned mainland company). Auditor investigations by the HKICPA have resulted in financial penalties for Arthur Andersen (HK\$4 million) and Deloitte Touche Tohmatsu (HK\$3.5 million).⁴

The fourth actor in Hong Kong's regulatory regime is the ICAC, which investigates cases of suspected corruption. The ICAC has launched several high-profile investigations targeting corruption between executives and auditors. This includes the arrest in June 2003 of an audit partner in the Hong Kong office of Ernst & Young in connection with its audit of Global Trend Intelligent Technologies. In April 2010, the ICAC charged a senior manager in the Hong Kong office of KPMG with offering a bribe of HK\$100,000 to his subordinate in return for falsifying documents in the initial public offering (IPO) of Hontex International Holdings.

Market factors also help ensure a relatively strong institutional environment in Hong Kong. H-shares are directly traded on the Hong Kong Stock Exchange and are included in the investment portfolios of many institutional investors. Therefore, the AH companies and their Hong Kong auditors are subject to monitoring by market participants such as analysts and institutional investors. Investors in Hong Kong have actively pursued their claims against Hong Kong auditors. For example, the Hong Kong office of Ernst & Young recently paid a record US\$200m to the liquidator of Akai Holdings to settle a lawsuit relating to its audits in the 1990s (Rovnick and Yiu 2009).

The media in Hong Kong also play an important role in enforcement. Journalists have published articles about the HKICPA's investigations of auditors at JW International Holdings (Wong 2002) and Euro-Asia Agricultural Holdings (Wong 2003). In addition, the media have covered the HKICPA's investigations of Climax International, Cosco International, Shun Shing, GKC Holdings, and Guangnan Holdings (*The Accountant* 2000; Moir 2004). Therefore, the media helps to reinforce the monitoring carried out by Hong Kong's regulatory agencies and investors.

Pure A-Share Companies

Pure A-share companies are listed in China, but not in Hong Kong, so they have little exposure to Hong Kong's institutional environment. Enforcement in China is generally considered weak because oversight by the China Securities Regulatory Commission (CSRC) is subject to political interference. For example, the accounting scandal at Hainan Minyuan Modern Agricultural Companies was China's largest fraud in the 1990s, involving RMB 1.2 billion in illegal real estate

³ The HKSFC delegates a significant portion of its powers to the HKSE as set out in the Memorandum of Understanding Governing Listing Matters. Hence, HKSE takes the lead role in regulating the Hong Kong markets.

⁴ In one case, court documents show that the HKSE referred the audit of Climax International to the HKICPA in September 1999. As a result of their investigation, the HKICPA fined Arthur Andersen and three of its audit partners HK\$4 million. In a second case, the HKICPA brought proceedings against Price Waterhouse for alleged negligence in connection with its audit of Cosco International in 1997. Cosco had acquired Shun Shing Holdings in March 1997 and the auditors of Shun Shing (Ernst & Young) were investigated by the HKICPA. In a third case, court documents show that the HKICPA launched an investigation into Deloitte Touche Tohmatsu for its audits of GKC Holdings in the period 1994 to 1997. Again, the HKICPA launched this investigation following a referral from the HKSE in January 1999 and the auditors were fined HK\$3.5 million. In a fourth case, the auditors of Guangnan Holdings were referred by the HKSE to the HKICPA in March 1999.

transactions. The company's directors were politically connected to the family of China's former leader Deng Xiaoping and escaped punishment. The CSRC even declined the company's offer of help in its search for the directors (Anderson 2000).

Enforcement through private lawsuits is also uncommon in China, as legal protection for minority investors is relatively weak (Allen, J. Qian, and M. Qian 2005).⁵ Although the legal environment has improved in recent years (Chen, Sun, and Wu 2010), it still lags Hong Kong in terms of the protection afforded to minority investors. Indeed, Pistor and Xu (2005) find that legal enforcement has played only a minor role in China's economic development. The disciplinary role of market forces is also relatively weak in China. The market for financial analysts is not well developed and institutional ownership is low (Chen, Ke, and Yang 2013). Moreover, institutional investors and brokerage firms are often affiliated with the government, which means they lack strong incentives to protect private shareholders. Finally, the media in China are less active than their counterparts in Hong Kong in terms of investigating and publicizing accounting scandals. Government control of the media can prevent full disclosure, as media stories are affected by political interests.

AB Companies

AB companies offer B-shares to foreign investors and A-shares to domestic investors.⁶ They are different from AH companies because AB companies are not exposed to scrutiny from the HKSE or HKSFC as they are not cross-listed in Hong Kong. In theory, the B-share auditors of AB companies are subject to scrutiny from the HKICPA if the auditors are registered in Hong Kong, but in practice, the HKICPA usually acts against an audit firm only when the case is referred to it by the HKSE or HKSFC. This cannot happen for AB companies because they are not cross-listed in Hong Kong. For the same reason, we argue that the ICAC is unlikely to prosecute Hong Kong-registered B-share auditors of AB companies. Consequently, the HKICPA and ICAC cannot provide effective oversight of B-share audits.

Hypotheses Development

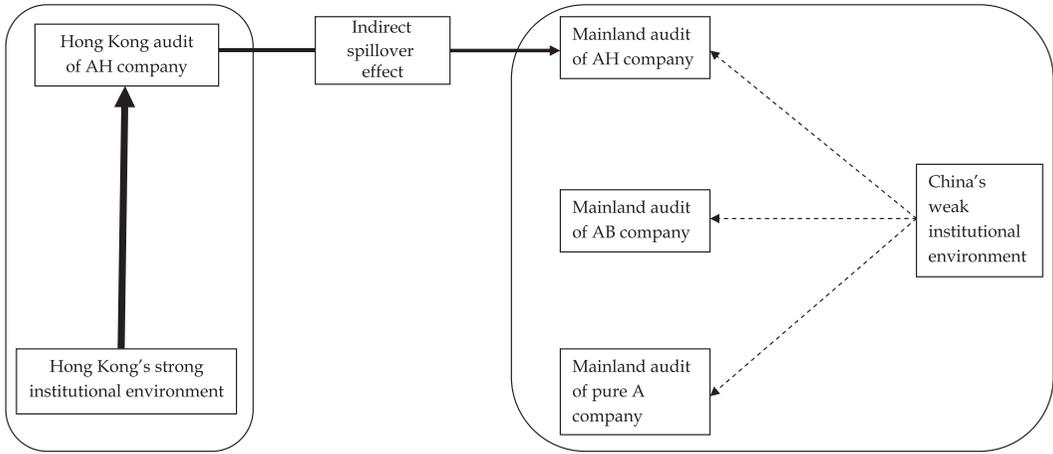
While the institutional environment is weaker in China than in Hong Kong, our objective is not to compare audit quality in China versus Hong Kong. Rather, we examine audit quality within mainland China alone. Thus, it is necessary to explain how Hong Kong's institutional environment has an indirect spillover effect on audits carried out in China. The Hong Kong auditors of AH companies are subject to the tougher environment of Hong Kong when they audit the H-share financial statements. We argue that this has a positive spillover effect on the quality of A-share audits of AH companies. The A-share audits of AB and pure A companies are not subject to this spillover because these companies are not cross-listed in Hong Kong.

Our arguments are illustrated in Figure 1. Hong Kong's institutional environment is relatively strong, which means the H-share audits of AH companies are relatively high quality. In comparison, the institutional environment in mainland China is weak and does little to improve the quality of A-share audits. However, the A-share audits of AH companies benefit from an *indirect* spillover effect from Hong Kong because the second set of H-share financial statements are signed off by Hong Kong auditors. In contrast, the A-share audits of pure A and AB companies are not

⁵ It was not until 2003 that the first Big 4 audit firm was sued on the mainland. The plaintiff was a woman from Shanghai who sued KPMG for just US\$1,800 in connection with its audits of Jinzhou Port, which is an AB company and, therefore, not cross-listed in Hong Kong. The case was subsequently resolved out of court in an undisclosed settlement.

⁶ From February 19, 2001 onward, domestic Chinese investors have been allowed to invest in B-shares as long as they pay for the shares using a foreign currency.

FIGURE 1
The Indirect Effect of Hong Kong’s Institutional Environment on the Mainland Audits of AH Companies



Mainland audit = an audit of financial statements prepared for domestic investors under China’s accounting standards. Hong Kong audit = an audit of financial statements prepared for overseas investors under Hong Kong’s accounting standards. An AH company is cross-listed in Hong Kong and offers H shares to foreigners. An AB company is listed only in China and offers B shares to foreigners. A pure A company is listed only in China and is not allowed to offer shares to foreigners.

exposed to this spillover because these companies are listed only in China. Thus, when compared with the A-share audits of AH companies, we expect: (1) the Big 4 in mainland China assign their less experienced partners to the A-share audits of AB and pure A companies, (2) the quality of A-share audits is lower for AB and pure A companies, and (3) the quality of financial reporting quality is lower for the A-share financial statements of AB and pure A companies.

Consistent with the first of these three predictions, an influential newspaper in China, the *China Business Journal* (2011), claims that:

For a long time, there has been an unspoken rule among the Big Four accounting firms in mainland China: If an audit client will go to Hong Kong for stock listing, a mainland Big Four firm will assign a strong audit team to conduct the audit. However, if the audit client will be listed on a mainland stock exchange, the Big Four will assign a weaker audit team to conduct the audit. The main reason for such behavior is not because of the differences in the quality of audit clients across the two markets, but because of the differences in the ability and toughness of securities regulators across the two markets. In today’s society that is fixated on financial profits, if securities regulators are not very picky about audit quality, why would an auditing firm invest so much on audit assurance?⁷

⁷ To evaluate this claim, we have spoken to auditors in mainland China to learn more about how the A-share and H-share audits are typically conducted for AH companies. When the two audits are done by the Hong Kong and mainland offices of the same audit firm, which is the case for most AH companies in our sample, the two sides generally form a joint audit team. The Hong Kong office typically sends senior members of its staff to oversee the joint fieldwork conducted in China. In this way, the Hong Kong office exerts influence over the quality of the work done on the A-share audit.

Prior research finds that experienced partners provide higher-quality audits in China (Gul, Wu, and Yang 2013; Lennox, Wu, and Zhang 2013). Companies that are listed only in mainland China are not subject to regulatory oversight from Hong Kong, so we expect that supplying high-quality audits is less important for these companies. Accordingly, the Big 4 firms in mainland China would assign their less experienced partners to these audits. We formally test this in the following hypothesis:

H1: The Big 4 audit firms assign relatively inexperienced partners to the A-share audits of pure A companies and AB companies compared with the partners who are assigned to the A-share audits of AH companies.

To test H1, we measure experience using the number of years that the partner has been auditing listed companies.

Next, we consider more traditional measures of audit quality. We posit that it would be relatively difficult for an auditor in China to compromise on quality when auditing a company cross-listed in Hong Kong. For example, it would be difficult for an auditor in China to issue a clean opinion on the A-share financial statements if the auditor in Hong Kong refuses to give a clean opinion on the same company's H-share financial statements.⁸ It is easier to compromise on quality when auditing the A-share financial statements of a pure A company or an AB company. This leads to our second hypothesis:

H2: The quality of A-share audits is lower for pure A companies and AB companies than for AH companies.

We test H2 using audit opinions and audit fees as alternate proxies for audit quality.

Because high-quality auditing should lead to high-quality financial reporting, we also examine the quality of the A-share financial statements. For AH companies, the accounting assumptions underpinning the A-share financial statements are inextricably linked to the assumptions used in the H-share financial statements. According to a CSRC regulation (CSRC 2001), AH companies are not permitted to use different accounting estimates for the same accounting event when preparing the A-share and H-share financial statements. Thus, a strict audit of the H-share financial statements can effectively prevent earnings management in the A-share financial statements. On the other hand, managers have some flexibility to choose different accounting policies for the two sets of financial statements because the H-share financial statements are prepared according to international reporting standards, whereas the A-share financial statements are prepared according to Chinese generally accepted accounting principles (GAAP). Despite this flexibility, the board of directors is required to explain the accounting policy differences in the management discussion section of the annual report. In addition, management is required to reconcile the two sets of financial statements, and auditors are required to pay close attention to the authenticity and completeness of the reconciliation. Given these constraints, we expect an H-share audit helps to prevent earnings management in the A-share financial statements of AH companies. This leads to our third hypothesis:

H3: The quality of the A-share financial statements is lower for pure A companies and AB companies than for AH companies.

We test H3 using abnormal accruals as the proxy for financial reporting quality.

⁸ A senior audit manager working in the mainland office of a Big 4 firm told us that it would be difficult for a mainland auditor to issue a clean audit opinion on the A-share financial statements if the auditors in Hong Kong refused to issue a clean opinion on the same company's H-share financial statements.

IV. RESEARCH DESIGN

Research Design for H1

We investigate how the Big 4 in mainland China assign their partners to cross-listed and non-cross-listed clients by estimating the following model:

$$EXPERIENCE = \alpha_0 + \alpha_1 WEAK + CONTROLS + u. \quad (1)$$

The dependent variable measures partner experience. To construct this variable, we count the number of years the partner has audited at least one listed company up to the beginning of year t . As we are interested in partner i 's experience relative to other partners in the same audit firm, we follow Ke and Yu (2006) by constructing a relative measure as follows:

$$REL_YEARS_{ijt} = 100 - \frac{(-1 + RANK_YEARS_{ijt})}{(-1 + N_{jt})} \times 100$$

where $RANK_YEARS_{ijt}$ is a ranked measure of partner i 's experience in audit firm j at time t , and N_{jt} is the total number of partners in audit firm j with public clients in year t .⁹ The REL_YEARS_{ijt} variable ranges from 0 to 100, with higher values indicating that partner i has relatively more experience. Audit reports in China are signed by both the engagement and review partners, and the $EXPERIENCE$ variable equals the mean value of REL_YEARS_{ijt} across the two partners.

The treatment variable ($WEAK$) equals 1 if the company's Big 4 auditor is not subject to the spillover from Hong Kong, and 0 otherwise. There are three groups of observations where $WEAK$ equals 1: (1) pure A-share companies, (2) AB-share companies, and (3) AH-share companies that opt out of preparing H-share financial statements once this becomes permissible, from 2010 onward. The $WEAK$ variable takes the value of 0 for the AH companies that prepare H-share financial statements as, in these cases, the A-share auditors are exposed to the spillover from Hong Kong.

Under H1, we expect less experienced partners are assigned to audits that are not exposed to the positive spillover from Hong Kong. Therefore, we predict a negative coefficient on the $WEAK$ variable in Equation (1). In addition, we create three separate indicator variables for the three situations in which the $WEAK$ variable takes the value 1: (1) $WEAK_A$ equals 1 for the pure A-share companies, and 0 otherwise; (2) $WEAK_AB$ equals 1 for the AB companies, and 0 otherwise; and (3) $WEAK_AH$ equals 1 for the AH companies that abandon the H-share audit once this becomes permissible (2010–2012), and 0 otherwise. Unfortunately, as shown later, we have only a small sample of companies with $WEAK_AH$ equal to 1. Hence, we avoid emphasizing the regression results for $WEAK_AH$ in Section V.

Research Design for H2

To investigate whether Hong Kong's institutional environment affects audit quality in mainland China, we estimate the following models of audit reporting and audit fees:

$$\Pr(OPINION = 1) = F(\alpha_0 + \alpha_1 WEAK + CONTROLS + u). \quad (2)$$

$$\ln(AF) = \alpha_0 + \alpha_1 WEAK + CONTROLS + u. \quad (3)$$

Consistent with prior research on China, we assess audit quality by examining the auditor's propensity to issue a non-clean opinion (DeFond, Wong, and Li 2000; C. Chen, S. Chen, and Su

⁹ Accordingly, our measure does not include any partners who only audit private companies.

2001; Chan, Lin, and Mo 2006; Gul, Sami, and Zhou 2009; Chen et al. 2010; Chan and Wu 2011). The *OPINION* variable equals 1 if the opinion on the A-share financial statements is non-clean, and 0 if clean. Under H2, the Big 4 are less likely to issue non-clean opinions when there is no spillover from Hong Kong. Therefore, we predict a negative coefficient on *WEAK* in Equation (2). Next, we use audit fees to measure audit quality (Craswell, Francis, and Taylor 1995; Choi et al. 2008). The dependent variable is the natural log of the fee for the A-share audit ($Ln(AF)$). Under H2, we expect less audit effort and, therefore, lower fees for the A-share audits of pure A and AB companies. Accordingly, we predict a negative coefficient on *WEAK* in Equation (3). Because we examine the fees for A-share audits, as opposed to H-share or B-share audits, our $Ln(AF)$ variable is not affected by the extra requirements that come from being cross-listed.¹⁰

Research Design for H3

Finally, we investigate whether the weak environment in China affects the quality of financial reporting in the A-share financial statements. We measure financial reporting quality using abnormal working capital accruals (DeFond and Park 2001; Carey and Simnett 2006) and abnormal accruals estimated using the Jones (1991) model. We focus on signed rather than absolute abnormal accruals because auditors are more concerned about clients overstating rather than understating earnings (Kinney and Martin 1994; Caramanis and Lennox 2008). In Equations (4) and (5), the dependent variables are signed abnormal working capital accruals (*AWCA*) and signed Jones (1991) model abnormal accruals (*DA_Jones*):

$$AWCA = \alpha_0 + \alpha_1 WEAK + CONTROLS + u. \quad (4)$$

$$DA_Jones = \alpha_0 + \alpha_1 WEAK + CONTROLS + u. \quad (5)$$

Under H3, the Big 4 allow their clients to report more aggressively when there is no spillover from the H-share audit in Hong Kong. Therefore, we predict positive coefficients on *WEAK* in Equations (4) and (5).

Control Variables

This section discusses the control variables in Equations (1) to (5). Table 1 provides definitions for each variable.

The Determinants of Partner Experience (Equation (1))

We expect experienced partners are assigned to audits that are relatively complex. Our complexity variables include the square root of the number of subsidiaries (*NSUB*), a dummy variable indicating whether the company has overseas operations (*FOROPS*), the natural log of the number of business segments ($Ln(\#SEG)$), the current ratio (*CURRENT*), and the ratio of accounts receivable and inventory to total assets (*ARINV*). We also include controls for company size (*SIZE*), leverage (*LEV*), and state-owned enterprises (*SOE*). To ensure that the *WEAK* variable is not spuriously capturing the effect of having two sets of financial statements with different auditors, we control for *DOUBLE*, which equals 1 if the A-share and B-share (or A-share and H-share) financial

¹⁰ The audit fees paid by AH companies are allocated between the auditors of the A-share and H-share financial statements according to the amount of work done by each office, multiplied by the unit price of effort. The unit price charged by the Hong Kong office is higher because labor is more costly in Hong Kong and because the risk of litigation is higher than in mainland China. In addition, the extra work associated with Hong Kong's listing requirements (e.g., the reconciliation between the A-share and H-share financial statements) is borne by the Hong Kong office.

TABLE 1

Definitions for the Dependent and Independent Variables

Panel A: Dependent Variables

| Variable | Definition |
|-------------------|--|
| <i>EXPERIENCE</i> | = average relative experience of the two partners who sign the audit report. For each signing partner, we count the number of years that the partner has audited at least one listed company up to the end of year t . As we are interested in partner i 's experience relative to all other partners in the same audit firm, we construct a relative measure: $REL_YEARS_{ijt} = 100 - \frac{(-1 + RANK_YEARS_{ijt})}{(-1 + N_{jt})} \times 100$, where $RANK_YEARS_{ijt}$ is partner i 's ranking in audit firm j at time t , and N_{jt} is the total number of partners in audit firm j at time t . REL_YEARS_{ijt} ranges from 0 to 100, with higher values indicating that partner i has relatively more experience. The <i>PARTNER_YEARS</i> variable equals the mean value of REL_YEARS_{ijt} for the two signing partners. |
| <i>OPINION</i> | = 1 if the auditor issues a non-clean opinion; equals 0 if the opinion is clean. See Panel A of Table 5 for further details on how we code audit opinions as non-clean or clean. |
| $Ln(AF)$ | = natural log of audit fees. |
| <i>AWCA</i> | = signed abnormal working capital accruals. |
| <i>DA_Jones</i> | = signed abnormal accruals estimated using the modified Jones (1991) model. |

Panel B: Treatment Variables

| Variable | Definition |
|----------------|---|
| <i>WEAK</i> | = 0 if the company is cross-listed in Hong Kong and its H-share financial statements are audited in Hong Kong; equals 1 otherwise (i.e., AB companies, pure A companies, or AH companies that do not prepare H-share financial statements). |
| <i>WEAK_A</i> | = 1 if the company is a pure A-share company; equals 0 otherwise. |
| <i>WEAK_AB</i> | = 1 if the company is an AB company; equals 0 otherwise. |
| <i>WEAK_AH</i> | = 1 if the company is an AH company and it does not hire a Hong Kong auditor; equals 0 otherwise. |

Panel C: Control Variables

| Variable | Definition |
|----------------|--|
| <i>DOUBLE</i> | = 1 if the company's financial statements for domestic and foreign investors are signed by different audit firms or different audit offices; equals 0 otherwise. |
| <i>SIZE</i> | = natural log of total assets. |
| <i>LEV</i> | = total liabilities divided by total assets. |
| <i>LOSS</i> | = 1 if the company reports a loss; equals 0 otherwise. |
| <i>ROE</i> | = net income divided by shareholder equity. |
| <i>RETURN</i> | = annual market-adjusted abnormal return. |
| <i>CURRENT</i> | = current assets divided by current liabilities. |
| <i>CASH</i> | = cash, cash equivalents, and investment securities, divided by total assets. |
| <i>ARINV</i> | = accounts receivable and inventory, divided by total assets. |
| <i>SOE</i> | = 1 if the company is a state-owned enterprise; equals 0 otherwise. |

(continued on next page)

TABLE 1 (continued)

| Variable | Definition |
|-----------------|--|
| <i>CFO</i> | = operating cash flows divided by lagged total assets. |
| <i>MB</i> | = ratio of a company's market value of equity to its book value of equity. |
| <i>VOL</i> | = variance of the residual from the market model. |
| <i>NSUB</i> | = square root of the number of subsidiaries included in the consolidated financial statements. |
| <i>FOROPS</i> | = 1 if the company reports a foreign currency translation adjustment; equals 0 otherwise. |
| <i>Ln(#SEG)</i> | = natural log of the number of business segments. |

statements are signed by different audit firms or by different offices of the same audit firm, and 0 otherwise.¹¹

The Determinants of Audit Reporting (Equation (2))

Because distressed companies are more likely to receive non-clean audit opinions, we control for a company's financial health. We measure accounting performance using the incidence of losses (*LOSS*) and a continuous measure of profitability (*ROE*). To control for liquidity, we include current assets divided by current liabilities (*CURRENT*); cash, cash equivalents, and investment securities, divided by total assets (*CASH*); and accounts receivable and inventory, divided by total assets (*ARINV*). We also control for company size (*SIZE*), leverage (*LEV*), state-owned enterprises (*SOE*), annual market-adjusted abnormal returns (*RETURN*), and the presence of two sets of financial statements signed by different auditors (*DOUBLE*).

The Determinants of Audit Fees (Equation (3))

We draw on control variables typically used in the audit fee literature (Hay, Knechel, and Wong 2006), such as company size (*SIZE*), financial health (*LEV*, *LOSS*, *ROE*), and audit complexity (*NSUB*, *FOROPS*, *Ln(#SEG)*, *CURRENT*, and *ARINV*). We also control for the presence of two financial statements signed by different auditors (*DOUBLE*) because the cost of an A-share audit is expected to be lower if the company also has B-share or H-share financial statements concurrently audited by a different audit firm or a different audit office.

The Determinants of Abnormal Accruals (Equations (4) and (5))

We follow prior studies (Carey and Simnett 2006; Francis and Yu 2009) by controlling for operating cash flows (*CFO*), sales growth (*SALESGROWTH*), the market-to-book ratio (*MB*), and volatility (*VOL*). In addition, we include controls for company size (*SIZE*), leverage (*LEV*), and state-owned enterprises (*SOE*).

¹¹ We can empirically distinguish between the effects of *WEAK* and *DOUBLE* because there are 110 AB observations where *DOUBLE* = 1 and *WEAK* = 0. Not surprisingly, there is a significant negative correlation between the *WEAK* and *DOUBLE* variables (corr. = -0.82). Although the correlation is high, it does not cause multicollinearity problems, as the variance inflation factors are less than 5 for all the variables in our regressions.

V. MAIN RESULTS

The Sample and Descriptive Statistics

The sample comprises A-share audits by Big 4 firms over the period 1995 to 2012. We start in 1995 because a new set of auditing standards was introduced in that year (DeFond et al. 2000). This yields an initial sample of 1,414 company-year observations. We drop 125 observations in the financial industry because many of our variables are not meaningful in that sector. We drop a single Big 4 client with seven annual observations that is cross-listed in Singapore because our focus is on companies that are either cross-listed in Hong Kong (AH) or listed only in China (AB or A). We delete two observations where the Hong Kong auditor is a non-Big 4 firm because our objective is to test whether Big 4 quality is uniform across different environments. This leaves a final sample of 1,280 A-share audits by the Big 4 firms ($1,280 = 1,414 - 125 - 7 - 2$).

As shown in Panel A of Table 2, there are 553 A-share audits for the pure A companies, 331 A-share audits for the AB companies, and 396 A-share audits for the AH companies. The AB sample includes 213 observations where the AB companies prepare two sets of financial statements, A-share statements for domestic investors and B-share statements for foreign investors, and another 118 AB observations with only domestic financial statements.¹² In the AH sample, there are 370 observations where companies prepare two sets of financial statements, A-share statements for domestic investors and H-share statements for foreign investors, while there are 26 observations for A-share statements only, which became permissible in 2010–2012.

While our main sample comprises 1,280 observations, Table 2, Panel B shows that some of the dependent variables have missing observations. For example, there are 95 missing observations for the *EXPERIENCE* variable due to non-disclosure of the signing partners' names. Therefore, there are 1,185 observations in the *EXPERIENCE* model ($1,185 = 1,280 - 95$). We have no missing observations for the audit opinion model (*OPINION*), so the sample size is 1,280. Audit fee disclosure in China started in 2001, which is the main reason our audit fee sample includes only 817 observations. The abnormal accruals models are estimated for 1,214 observations because 66 observations lack cash flow statements.

Table 3 reports differences in the dependent variables between the two samples. Consistent with H1, audit partners are significantly more experienced in the strong institutional environment. We also find a higher frequency of non-clean audit opinions in the strong environment, although this difference is not statistically significant. Consistent with H2, we find that audit fees are significantly higher for companies operating in the strong environment. Consistent with H3, the signed Jones (1991) model abnormal accruals (*DA_Jones*) are significantly larger in the weak institutional sample, although this difference is not significant using abnormal working capital accruals (*AWCA*).

We also see in Table 3 some significant differences in the control variables between the two samples. In particular, companies in the strong institutional environment are significantly larger (*SIZE*), more highly leveraged (*LEV*), have lower liquidity (*CURRENT*), less cash (*CASH*), less non-cash working capital (*ARINV*), are more likely to be state-owned (*SOE*), have fewer growth opportunities (*MB*), and fewer business segments (*Ln(#SEG)*). We control for these differences in two ways. First, we include these factors as control variables in our regression models in Tables 4–8. Second, we use propensity scores to match each observation in the strong institutional sample to its closest match in the weak institutional sample. After this propensity score matching, the results

¹² Due to a change in regulations, the AB companies have not been required to prepare separate B-share financial statements since 2007. Our results are robust if the sample period ends in 2006 instead of 2012.

TABLE 2

The Samples Comprise Big 4 Audits of the A-Share Financial Statements in Mainland China (1995–2012)

Panel A: The Full Sample of Big 4 Audits

| | <u>Observations</u> |
|--|---------------------|
| Pure A companies (<i>WEAK</i> = 1) | 553 |
| AB companies (<i>WEAK</i> = 1) | 331 |
| AH companies that do not prepare separate H-share financial statements (<i>WEAK</i> = 1) | 26 |
| AH companies whose H-share financial statements are audited by Hong Kong auditors (<i>WEAK</i> = 0) | 370 |
| Total | <u>1,280</u> |

The 553 observations in the pure A-share sample prepare A-share financial statements only (not B-share or H-share financial statements). Of the 331 observations in the AB-share sample, 213 prepare both A-share and B-share financial statements, whereas 118 prepare A-share financial statements only ($331 = 213 + 118$). Of the 213 that prepare both A-share and B-share financial statements, in 15 cases, the financial statements are audited by different audit firms; in 95 cases, they are audited by different offices of the same audit firm; and in 103 cases, they are audited by the same office ($213 = 15 + 95 + 103$). Of the 396 observations in the AH sample, 370 prepare both A-share and H-share financial statements, whereas 26 prepare A-share financial statements only ($396 = 370 + 26$). Of the 370 that prepare A-share and H-share financial statements, in three cases the financial statements are audited by different audit firms, and in 367 cases, they are audited by different offices of the same audit firm ($370 = 3 + 367$).

Panel B: The Subsamples Used to Test H1, H2, and H3

| | <u>Partners' Years of Experience (H1)</u> | <u>Audit Opinions (H2)</u> | <u>Audit Fees (H2)</u> | <u>Abnormal Accruals (H3)</u> |
|----------------------------------|---|------------------------------------|--------------------------------|---------------------------------------|
| Weak sample (<i>WEAK</i> = 1) | 851 | 910 | 703 | 874 |
| Strong sample (<i>WEAK</i> = 0) | 334 | 370 | 114 | 340 |
| Totals | <u>1,185</u> | <u>1,280</u> | <u>817</u> | <u>1,214</u> |

Audit reports in China are supposed to disclose the names of the signing partners, but in our sample, there are 95 audit reports that do not disclose partners' names. Therefore, we have 1,185 observations for our tests of audit partners' years of experience ($1,185 = 1,280 - 95$). For the audit fee variable, we lose 166 observations because disclosure of audit fees started only in 2001, we lose 23 observations because audit fees are not disclosed by A-share companies, and we lose 274 observations because some AH and AB companies do not separately disclose the fees paid to their A-share and H-share (or B-share) auditors. Thus, there are 817 observations where data are unavailable on A-share audit fees ($817 = 1,280 - 463$). Abnormal accruals are missing for 66 observations due to unavailable cash flow statements ($1,214 = 1,280 - 66$).

in Table 8, Panel B indicate that the control variables are generally not significantly different between the treatment and control groups.

Results for H1

Under H1, we expect the Big 4 to assign their less experienced partners to audits in the weak institutional environment. Therefore, we predict a negative coefficient on *WEAK* in Equation (1). Because the sample is pooled across multiple years relating to the same company, the standard errors in each regression are clustered by company.

Table 4 reports results for the models of *EXPERIENCE*. We find a significant negative coefficient on the *WEAK* variable (t-stat. = -2.12). Consistent with H1, we conclude that the Big 4

TABLE 3
Differences Between the Samples for the Strong and Weak Environments

| | Strong Environment (n = 370; WEAK = 0) | | Weak Environment (n = 910; WEAK = 1) | | Tests for Differences in Means and Medians (p-values) | |
|-------------------------|---|--------|---|--------|---|---------|
| | Mean | Median | Mean | Median | Means | Medians |
| <i>EXPERIENCE</i> | 58.802 | 58.611 | 54.911 | 54.167 | <0.01 | <0.01 |
| <i>OPINION</i> | 0.046 | 0.000 | 0.041 | 0.000 | 0.67 | — |
| <i>AF</i> (RMB million) | 4.660 | 1.907 | 2.066 | 1.300 | <0.01 | <0.01 |
| <i>Ln(AF)</i> | 14.627 | 14.459 | 14.087 | 14.078 | <0.01 | <0.01 |
| <i>AWCA</i> | -0.003 | 0.002 | -0.003 | 0.000 | 0.91 | 0.96 |
| <i>DA_Jones</i> | -0.009 | -0.007 | 0.006 | 0.003 | <0.01 | <0.01 |
| <i>SIZE</i> | 23.934 | 23.835 | 22.594 | 22.436 | <0.01 | <0.01 |
| <i>LEV</i> | 0.491 | 0.474 | 0.474 | 0.479 | 0.16 | 0.33 |
| <i>LOSS</i> | 0.103 | 0.000 | 0.071 | 0.000 | 0.06 | — |
| <i>ROE</i> | 0.089 | 0.100 | 0.100 | 0.107 | 0.21 | 0.09 |
| <i>RETURN</i> | -0.037 | -0.035 | 0.000 | -0.035 | 0.14 | 0.25 |
| <i>CURRENT</i> | 1.285 | 1.129 | 1.554 | 1.290 | <0.01 | <0.01 |
| <i>CASH</i> | 0.116 | 0.096 | 0.169 | 0.139 | <0.01 | <0.01 |
| <i>ARINV</i> | 0.243 | 0.220 | 0.304 | 0.287 | <0.01 | <0.01 |
| <i>SOE</i> | 0.973 | 1.000 | 0.825 | 1.000 | <0.01 | — |
| <i>CFO</i> | 0.094 | 0.095 | 0.079 | 0.076 | 0.02 | <0.01 |
| <i>MB</i> | 2.791 | 2.226 | 3.099 | 2.450 | 0.02 | <0.01 |
| <i>VOL</i> | 0.028 | 0.020 | 0.024 | 0.020 | 0.01 | 0.27 |
| <i>NSUB</i> | 3.886 | 3.464 | 3.857 | 3.464 | 0.84 | 0.65 |
| <i>FOROPS</i> | 0.351 | 0.000 | 0.309 | 0.000 | 0.14 | — |
| <i>Ln(#SEG)</i> | 0.450 | 0.000 | 0.628 | 0.693 | <0.01 | <0.01 |

The continuous variables are winsorized at the top and bottom percentiles in order to deal with outliers. See Table 1 for variable definitions.

assign less experienced partners to audits in the weak institutional environment, whereas they assign more experienced partners to companies cross-listed in Hong Kong. The *WEAK* coefficient is -5.992 , implying that partners in the weak environment are nearly 6 percent lower in the relative experience ranking when compared with other partners in the same firm. Further, we split the *WEAK* variable into its three subgroups (*WEAK_A*, *WEAK_AB*, *WEAK_AH*) to determine whether the results are consistent. We find significant negative coefficients on all three variables, with *t*-statistics of -1.82 , -2.09 , and -1.74 , respectively. The coefficients on *WEAK_A*, *WEAK_AB*, and *WEAK_AH* are not significantly different from each other.¹³

¹³ Table 4 finds that audit firms assign less experienced partners to state-owned companies (*SOE*). However, the results for the other control variables are generally insignificant. One possible explanation is that the dependent variables capture a partner's experience relative to all other partners within the same audit firm, whereas the control variables are not constructed using this within-firm approach. Therefore, in supplementary tests, we recompute the control variables on a relative basis. For example, *REL_SIZE* is a company's size relative to the sizes of the audit firm's other clients. Consistent with Table 4, most of the control variables remain insignificant when they are measured on a relative basis. Inferences for our treatment variables remain robust.

TABLE 4
Tests of H1
The Dependent Variable Measures Partners' Years of Experience (*EXPERIENCE*)

| | <u>Coeff.</u> | <u>t-stat.</u> | <u>Coeff.</u> | <u>t-stat.</u> |
|-----------------|---------------|----------------|---------------|----------------|
| <i>WEAK</i> | -5.992 | -2.12** | | |
| <i>WEAK_A</i> | | | -6.396 | -1.82* |
| <i>WEAK_AB</i> | | | -5.935 | -2.09** |
| <i>WEAK_AH</i> | | | -7.872 | -1.74* |
| <i>DOUBLE</i> | -1.504 | -0.54 | -1.843 | -0.60 |
| <i>SIZE</i> | -0.109 | -0.16 | -0.093 | -0.13 |
| <i>LEV</i> | -0.089 | -0.01 | -0.112 | -0.02 |
| <i>LOSS</i> | -4.482 | -1.67* | -4.507 | -1.67* |
| <i>ROE</i> | 2.603 | 0.49 | 2.547 | 0.48 |
| <i>NSUB</i> | 0.061 | 0.18 | 0.059 | 0.17 |
| <i>FOROPS</i> | -0.343 | -0.21 | -0.309 | -0.29 |
| <i>Ln(#SEG)</i> | 0.262 | 0.24 | 0.247 | 0.22 |
| <i>CURRENT</i> | -0.390 | -0.46 | -0.386 | -0.46 |
| <i>ARINV</i> | 3.884 | 0.78 | 3.884 | 0.79 |
| <i>SOE</i> | -3.617 | -1.78* | -3.603 | -1.71* |

Tests of differences in coefficients:

| | <u>p-values</u> | |
|--------------------------------------|-----------------|-------|
| <i>WEAK_A</i> versus <i>WEAK_AB</i> | 0.83 | |
| <i>WEAK_A</i> versus <i>WEAK_AH</i> | 0.69 | |
| <i>WEAK_AB</i> versus <i>WEAK_AH</i> | 0.61 | |
| Industry fixed effects | Yes | Yes |
| Year fixed effects | Yes | Yes |
| Adj. R ² | 0.049 | 0.049 |

** , * Denote statistical significance at the 5 percent and 10 percent levels (two-tailed), respectively. Standard errors are adjusted for clustering on each company. See Table 1 for variable definitions.

Results for H2

H2 predicts that the Big 4 are more likely to issue clean opinions and charge lower audit fees when they audit A-share financial statements in a weak institutional environment. Table 5, Panel A presents the distribution of the different types of audit opinions. There are 54 non-clean opinions (*OPINION* = 1). Of these, 26 mention going-concern uncertainties, 22 opinions are qualified due to limitations on audit scope, 12 disclose other material uncertainties relating to accounting estimates, three opinions are qualified due to departures from accounting standards, three disclose errors or irregularities, and two disclose emphases of matter relating to the companies' accounting choices. In total, there are 71 problems mentioned in 54 audit reports. The remaining 1,226 audit opinions are coded as clean (*OPINION* = 0).

Table 5, Panel B reports results for the audit opinion models. We find significant negative coefficients on *WEAK*, *WEAK_A*, and *WEAK_AB*, with z-statistics of -1.98, -2.67, and -1.89,

TABLE 5

Tests of H2

Unfavorable Audit Opinions (*OPINION*) and the Natural Log of Audit Fees ($\ln(AF)$)

Panel A: Types of Audit Opinions

Non-Clean Audit Opinions (*OPINION* = 1):

| | |
|---|------|
| Going-concern uncertainties | 26 |
| Limitations on audit scope | 22 |
| Other material uncertainties | 12 |
| Departures from GAAP | 3 |
| Errors or irregularities | 3 |
| Related-party transactions | 3 |
| Emphases of matter relating to accounting choices | 2 |
| Less: Multiple problem disclosures | (17) |

Total

54

Clean audit opinions (*OPINION* = 0):

| | |
|--|-------|
| Clean unmodified opinions | 1,223 |
| Modified opinions that do not indicate problems ^a | 3 |

Total

1,226

Panel B: Results for the Audit Opinion Models (Dep. Var. = *OPINION*)

| | <u>Coeff.</u> | <u>z-stat.</u> | <u>Coeff.</u> | <u>z-stat.</u> |
|----------------|---------------|----------------|---------------|----------------|
| <i>WEAK</i> | -1.554 | -1.98** | | |
| <i>WEAK_A</i> | | | -2.552 | -2.67*** |
| <i>WEAK_AB</i> | | | -1.474 | -1.89* |
| <i>WEAK_AH</i> | | | NA | NA |
| <i>DOUBLE</i> | 0.047 | 0.07 | -0.544 | -0.88 |
| <i>SIZE</i> | -1.221 | -4.46*** | -1.117 | -4.52*** |
| <i>LEV</i> | 6.706 | 3.45*** | 6.470 | 3.51*** |
| <i>LOSS</i> | 1.524 | 2.77*** | 1.581 | 2.93** |
| <i>ROE</i> | -2.852 | -2.02** | -2.673 | -1.94* |
| <i>RETURN</i> | -0.668 | -1.09 | -0.605 | -0.99 |
| <i>CURRENT</i> | 0.225 | 0.51 | 0.220 | 0.50 |
| <i>CASH</i> | -0.601 | -0.27 | -0.443 | -0.20 |
| <i>ARINV</i> | 1.331 | 0.95 | 1.367 | 1.01 |
| <i>SOE</i> | -0.698 | -1.18 | -0.953 | -1.52 |

Tests of differences in coefficients:

| | <u>p-values</u> | |
|-------------------------------------|-----------------|-------|
| <i>WEAK_A</i> versus <i>WEAK_AB</i> | 0.12 | |
| Industry fixed effects | Yes | Yes |
| Year fixed effects | Yes | Yes |
| Pseudo R ² | 0.436 | 0.444 |

NA: the coefficient and z-statistic for the *WEAK_AH* variable cannot be estimated because there are only 26 observations where *WEAK_AH* is equal to 1.

(continued on next page)

TABLE 5 (continued)

Panel C: Results for the Audit Fee Models (Dep. Var. = Ln(AF))

| | Coeff. | t-stat. | Coeff. | t-stat. |
|----------|--------|----------|--------|----------|
| WEAK | -0.261 | -1.76* | | |
| WEAK_A | | | -0.314 | -1.82* |
| WEAK_AB | | | -0.285 | -1.93* |
| WEAK_AH | | | 0.146 | 0.71 |
| DOUBLE | -0.176 | -2.08** | -0.198 | -2.06** |
| SIZE | 0.370 | 10.12*** | 0.368 | 10.13*** |
| LEV | 0.232 | 0.87 | 0.220 | 0.82 |
| LOSS | 0.138 | 1.51 | 0.140 | 1.53 |
| ROE | -0.034 | -0.21 | 0.008 | 0.05 |
| NSUB | 0.049 | 3.12*** | 0.044 | 2.70*** |
| FOROPS | 0.123 | 1.82* | 0.130 | 1.91* |
| Ln(#SEG) | 0.064 | 1.45 | 0.070 | 1.58 |
| CURRENT | -0.001 | -0.03 | -0.002 | -0.06 |
| ARINV | -0.047 | -0.20 | -0.061 | -0.25 |
| SOE | -0.233 | -2.92*** | -0.258 | -3.14*** |

Tests of differences in coefficients:

| | p-values | |
|------------------------|----------|-------|
| WEAK_A versus WEAK_AB | 0.70 | |
| WEAK_A versus WEAK_AH | 0.00 | |
| WEAK_AB versus WEAK_AH | 0.00 | |
| Industry fixed effects | Yes | Yes |
| Year fixed effects | Yes | Yes |
| Adj. R ² | 0.738 | 0.744 |

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Standard errors are adjusted for clustering on each company. See Table 1 for variable definitions.

respectively.¹⁴ Consistent with H1, this means that the Big 4 are less likely to issue non-clean opinions for clients in the weak institutional environment. We conclude that Big 4 auditors in mainland China are more likely to issue non-clean opinions when they are exposed to the positive spillover from the strong institutional environment of Hong Kong. Holding the control variables constant at their mean values, we find that moving from the weak environment to the strong environment raises the likelihood of an unfavorable audit opinion from 3.32 percent to 5.59 percent.¹⁵ Results for the control variables are consistent with prior research. We find significant

¹⁴ The WEAK_A and WEAK_AB coefficients are not significantly different from each other, indicating no difference in the issuance of non-clean opinions between AB and pure A companies. The coefficient and z-statistic for the WEAK_AH variable cannot be estimated because there are only 26 observations where WEAK_AH is equal to 1. Because of the small sample of WEAK_AH firms, we avoid discussing the results for WEAK_AH in the subsequent tables.

¹⁵ In an untabulated test, we focus on the most serious problems disclosed in audit reports. In this test, the OPINION variable equals 1 if the audit opinion mentions going-concern problems, limitations on audit scope, departures from GAAP, or errors or irregularities, and 0 otherwise. The coefficients on WEAK, WEAK_A, and WEAK_AB remain negative and statistically significant.

coefficients on the controls for company size (*SIZE*), leverage (*LEV*), losses (*LOSS*), and profitability (*ROE*). Smaller companies are more likely to receive non-clean opinions, as are companies with higher leverage, losses, or lower profitability.

Table 5, Panel C reports results for the audit fee models. Consistent with H2, we find significant negative coefficients on *WEAK*, *WEAK_A*, and *WEAK_AB*, with t-statistics of -1.76 , -1.82 , and -1.93 , respectively. Therefore, audit fees are significantly lower for companies that are listed only in China. We conclude that the Big 4 receive lower audit fees for their A-share audits if they are not exposed to a spillover from the strong institutional environment of Hong Kong. The estimated coefficient on *WEAK* of -0.261 translates into audit fees being an economically significant 29.8 percent lower in the weak institutional environment. Results for the control variables are consistent with prior research, with significant positive coefficients on company size (*SIZE*), the number of subsidiaries (*NSUB*), foreign operations (*FOROPS*), and the number of business segments ($\ln(\#SEG)$). State-owned enterprises (*SOE*) pay significantly lower audit fees. In addition, we find significant negative coefficients on the *DOUBLE* variable, indicating that audit fees are lower when companies have a second set of audited financial statements.

Results for H3

H3 predicts that financial reporting quality is lower for Big 4 audits in the weak institutional environment. We test this by examining signed abnormal accruals. If the weak institutional environment in China results in lower financial reporting quality, then we would expect higher signed abnormal accruals. Consistent with H3, the abnormal accrual models in Table 6 find significant positive coefficients on the *WEAK*, *WEAK_A*, and *WEAK_AB* variables, with t-statistics of 2.86, 3.42, and 2.93, respectively. We conclude that clients of the Big 4 report higher abnormal accruals when they are listed only in China compared with when they are cross-listed in Hong Kong. This is consistent with Hong Kong's institutional environment having a positive spillover effect on the quality of financial reporting in China.¹⁶ Results for the control variables reveal that signed abnormal accruals are higher for companies that are larger (*SIZE*), have lower leverage (*LEV*), report positive profits (*LOSS*), have poor cash flows from operations (*CFO*), have higher market-to-book ratios (*MB*), and are not state-owned (*SOE*).

VI. ALTERNATIVE EXPLANATIONS

Dual Accounting and Auditing Standards

The AH companies are subject to dual accounting and auditing standards as they prepare H-share financial statements as well as A-share financial statements. This is unlikely to explain our results because the major differences in audit quality and financial reporting quality are found between the AH and non-AH companies, rather than between the companies subject to double reporting (AH and AB) versus those subject to single reporting (pure A). In addition, the *WEAK_A* and *WEAK_AB* coefficients are statistically significant in all our models. Therefore, the AH companies are assigned more experienced partners, are more likely to receive non-clean audit opinions, pay higher audit fees, and have lower working capital accruals when compared with *both* the AB companies and the pure A-share companies. This is consistent with the results being driven

¹⁶ Prior research suggests that auditors are more concerned about clients overstating rather than understating earnings (Kinney and Martin 1994; Caramanis and Lennox 2008). Therefore, we check that our results continue to hold in tobit models that explain the magnitude of income-increasing abnormal accruals. In untabulated regressions, we find significant positive coefficients on *WEAK*, *WEAK_A*, *WEAK_AB*, and *WEAK_AH*.

TABLE 6
Tests of H3
Signed Abnormal Accruals

Panel A: Abnormal Working Capital Accruals (Dep. Var. = AWCA)

| | <u>Coeff.</u> | <u>t-stat.</u> | <u>Coeff.</u> | <u>t-stat.</u> |
|---------------------------------------|-----------------|----------------|---------------|----------------|
| <i>WEAK</i> | 0.034 | 2.86*** | | |
| <i>WEAK_A</i> | | | 0.054 | 3.42*** |
| <i>WEAK_AB</i> | | | 0.034 | 2.93*** |
| <i>WEAK_AH</i> | | | 0.031 | 1.52 |
| <i>DOUBLE</i> | 0.024 | 2.05** | 0.038 | 2.65*** |
| <i>SIZE</i> | 0.017 | 6.03*** | 0.017 | 6.12*** |
| <i>LEV</i> | -0.109 | -5.89*** | -0.106 | -5.85*** |
| <i>LOSS</i> | -0.039 | -3.05*** | -0.038 | -3.03** |
| <i>CFO</i> | -0.598 | -8.74*** | -0.600 | -8.79*** |
| <i>MB</i> | 0.004 | 2.40** | 0.004 | 2.49** |
| <i>VOL</i> | 0.094 | 0.66 | 0.087 | 0.60 |
| <i>SOE</i> | -0.034 | -3.02*** | -0.031 | -2.73*** |
| Tests of differences in coefficients: | | | | |
| | <u>p-values</u> | | | |
| <i>WEAK_A</i> versus <i>WEAK_AB</i> | 0.04 | | | |
| <i>WEAK_A</i> versus <i>WEAK_AH</i> | 0.11 | | | |
| <i>WEAK_AB</i> versus <i>WEAK_AH</i> | 0.83 | | | |
| Industry fixed effects | Yes | | Yes | |
| Year fixed effects | Yes | | Yes | |
| Adj. R ² | 0.235 | | 0.239 | |

Panel B: Abnormal Accruals Estimated Using the Modified Jones (1991) Model (Dep. Var. = DA_{Jones})

| | <u>Coeff.</u> | <u>t-stat.</u> | <u>Coeff.</u> | <u>t-stat.</u> |
|---------------------------------------|-----------------|----------------|---------------|----------------|
| <i>WEAK</i> | 0.023 | 2.55** | | |
| <i>WEAK_A</i> | | | 0.036 | 2.91*** |
| <i>WEAK_AB</i> | | | 0.023 | 2.52** |
| <i>WEAK_AH</i> | | | 0.032 | 2.52** |
| <i>DOUBLE</i> | 0.011 | 1.42 | 0.019 | 2.06** |
| <i>SIZE</i> | 0.012 | 4.13*** | 0.012 | 4.12*** |
| <i>LEV</i> | -0.130 | -6.85*** | -0.128 | -6.62*** |
| <i>LOSS</i> | -0.103 | -11.85*** | -0.102 | -11.95*** |
| <i>CFO</i> | -0.659 | -18.05*** | -0.661 | -17.88*** |
| <i>MB</i> | 0.008 | 4.14*** | 0.008 | 4.21*** |
| <i>VOL</i> | 0.163 | 3.04*** | 0.158 | 2.94*** |
| <i>SOE</i> | -0.016 | -1.93* | -0.015 | -1.72* |
| Tests of differences in coefficients: | | | | |
| | <u>p-values</u> | | | |
| <i>WEAK_A</i> versus <i>WEAK_AB</i> | 0.18 | | | |
| <i>WEAK_A</i> versus <i>WEAK_AH</i> | 0.74 | | | |
| <i>WEAK_AB</i> versus <i>WEAK_AH</i> | 0.42 | | | |

(continued on next page)

TABLE 6 (continued)

| | <u>Coeff.</u> | <u>t-stat.</u> | <u>Coeff.</u> | <u>t-stat.</u> |
|------------------------|---------------|----------------|---------------|----------------|
| Industry fixed effects | Yes | | Yes | |
| Year fixed effects | Yes | | Yes | |
| Adj. R ² | 0.592 | | 0.594 | |

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Standard errors are adjusted for clustering on each company. See Table 1 for variable definitions.

by a spillover from Hong Kong rather than by the dual accounting or dual auditing standards that are faced by both AH and AB companies.

Endogeneity

A potential concern is that a company's decision to cross-list in Hong Kong is endogenous. One approach would be to model the cross-listing decision in the first stage and control for endogeneity bias using the inverse Mills ratio in the second-stage models. This would require the researcher to find an exogenous variable that strongly affects the cross-listing decision, but has no direct impact on the second-stage dependent variables. In practice, it is extremely difficult to find compelling exclusion restrictions, and *ad hoc* restrictions are prone to giving unreliable inferences (Larcker and Rusticus 2010; Lennox, Francis, and Wang 2012).

Rather than employ the inverse Mills ratio, we use two alternative approaches. First, we follow J. Myers, L. Myers, and Omer (2003) and Lennox and Pittman (2010) by arguing that a company's choice to cross-list in Hong Kong is more appropriately viewed as predetermined and, hence, less endogenous if the choice was made longer ago. Thus, the *WEAK* variable is less likely to be affected by endogeneity bias in a sample of companies that have been cross-listed for a long time compared with a sample that has been cross-listed for a short time. Second, in the subsequent section, we conduct analyses using matched propensity scores to ensure that observed company characteristics are similar in the weak and strong samples.

Our first approach involves estimating the following model:

$$Dep. Var. = \alpha_0 + \alpha_1 WEAK + \alpha_2 WEAK \times SHORT + \alpha_3 SHORT + CONTROLS + u. \quad (6)$$

The dependent variables in Equation (6) are the same as before, i.e., *EXPERIENCE*, *OPINION*, $\ln(AF)$, *AWCA*, and *DA_Jones*. The control variables are also the same as before. The innovation in Equation (6) is the inclusion of *SHORT* and the interaction term *WEAK* × *SHORT*. The *SHORT* variable equals 1 if the length of time between the current fiscal year-end and the company's past IPO date is less than five years, and 0 otherwise. The IPO date refers to the H-share IPO date for AH companies, the B-share IPO date for AB companies, and the A-share IPO date for pure A companies. We argue that *WEAK* is more appropriately treated as exogenous when *SHORT* equals 0 because in this situation, the listing decision was made at least five years ago. If the results for *WEAK* are affected by endogeneity, then we would expect significant coefficients on the *WEAK* × *SHORT* variable. If endogeneity does not bias the results for *WEAK*, then we would expect the *WEAK* × *SHORT* coefficients to be insignificant.

Table 7 reports insignificant coefficients on *WEAK* × *SHORT* in all the models. This suggests that our results are unlikely to be contaminated by endogeneity bias. We continue to find significant

TABLE 7

Tests for Endogeneity Bias Arising from A Company's Choice to Cross-List in Hong Kong

$$Dep. Var. = \alpha_0 + \alpha_1 WEAK + \alpha_2 WEAK \times SHORT + \alpha_3 SHORT + CONTROLS + u. \quad (6)$$

| | Dependent Variable = | | | | |
|----------------------------|----------------------|--------------------|---------------------|-------------------|-------------------|
| | <i>EXPERIENCE</i> | <i>OPINION</i> | <i>Ln(AF)</i> | <i>AWCA</i> | <i>DA_Jones</i> |
| <i>WEAK</i> | -6.929 (-2.25)** | -1.654 (-1.77)* | -0.295 (-2.09)** | 0.031 (2.53)** | 0.022 (2.28)** |
| <i>WEAK</i> × <i>SHORT</i> | 3.269 (1.07) | 0.017 (0.02) | 0.367 (1.21) | 0.014 (1.09) | 0.002 (0.16) |
| <i>SHORT</i> | -4.335 (-1.62) | 0.801 (0.92) | -0.175 (-0.57) | -0.015 (-1.45) | 0.008 (0.81) |
| <i>CONTROLS</i> | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes |
| n | 1,185 | 1,280 | 817 | 1,214 | 1,214 |
| Adj. R ² | 0.052 | 0.444 | 0.743 | 0.235 | 0.593 |

** , * Denote statistical significance at the 5 percent and 10 percent levels (two-tailed), respectively.

We use the same control variables as in Tables 4 to 6, but for brevity, these results are not reported. Standard errors are adjusted for clustering on each company.

The *SHORT* variable indicates whether the company's cross-listing (listing) decision was made in the recent past or a long time ago. Specifically, the *SHORT* variable equals 1 if the length of time between the fiscal year-end date and the company's IPO date is less than five years, and 0 otherwise. The IPO date refers to the H-share IPO date for AH companies, the B-share IPO date for AB companies, and the A-share IPO date for pure A companies. t-statistics (OLS models) and z-statistics (logit models) are reported in parentheses. If endogeneity is an issue, then we expect to find significant coefficients on the *WEAK* × *SHORT* interaction variable.

See Table 1 for variable definitions.

negative coefficients on *WEAK* in the models for partner experience, partner age, audit opinions, and audit fees, and we continue to find significant positive coefficients on *WEAK* in the abnormal accruals models. Thus, our results are robust in the subsample of observations where *SHORT* equals 0, which is where we expect the cross-listing decision to be more appropriately viewed as exogenous.¹⁷

Analyses Using Matched Propensity Scores

To further control for differences between the treatment and control groups, we match each AH company to its closest match that is listed only in China. We begin by modeling a company's decision to cross-list in Hong Kong:

$$AH = \alpha_0 + \alpha_1 SIZE + \alpha_2 LEV + \alpha_3 ROE + \alpha_4 LOSS + \alpha_5 MB + \alpha_6 SALES GROWTH + \alpha_7 SOE + \alpha_8 CAPE + \alpha_9 LSHARE + \alpha_{10} NSUB + \alpha_{11} FOROPS + \alpha_{12} Ln(\#SEG) + \alpha_{13} CURRENT + \alpha_{14} ARINV + \alpha_{15} RETURN + \alpha_{16} CASH + \alpha_{17} VOL + \alpha_{18} PC + u \quad (7)$$

¹⁷ Similar results are obtained when we use a different time horizon for the *SHORT* variable, e.g., eight years instead of five. Results are also similar if we include interactions between the *SHORT* variable and each of the control variables.

where the dependent variable (*AH*) equals 1 if the company is cross-listed in Hong Kong, and 0 otherwise.

Consistent with prior research (Fernandes and Ferreira 2008; Doidge et al. 2009; Hung, Wong, and Zhang 2012), Equation (7) includes the following independent variables as determinants of the cross-listing decision: *SIZE*, *LEV*, *ROE*, *LOSS*, *MB*, *SALESGROWTH*, *SOE*, *CAPE*, *LSHARE*, and *PC*. The *SIZE*, *LEV*, *ROE*, *MB*, and *SOE* variables are defined as before (see Table 1). The *SALESGROWTH* variable is the annual growth rate in the company's sales revenue, *CAPE* equals capital expenditure divided by total assets, *LSHARE* is the stock ownership (%) of the company's largest shareholder, and *PC* is an indicator for whether the chairman or CEO are politically connected.¹⁸ Equation (7) also includes the other independent variables from the second-stage models (*NSUB*, *FOROPS*, *Ln(#SEG)*, *CURRENT*, *ARINV*, *RETURN*, *CASH*, and *VOL*) to control for these company characteristics.

The results for Equation (7) reveal significant positive coefficients on *SIZE* (z-stat. = 13.30), *SOE* (z-stat. = 4.08), *CURRENT* (z-stat. = 2.14), and *PC* (z-stat. = 2.26). Thus, the *AH* companies tend to be larger, are more likely to be state-owned, have a higher current ratio, and are more likely to have a politically connected chairman or CEO. We also find significant negative coefficients on *LEV* (z-stat. = -1.89), *ROE* (z-stat. = -2.17), *CAPE* (z-stat. = -2.41), *LSHARE* (z-stat. = -5.43), *Ln(#SEG)* (z-stat. = -4.24), and *CASH* (z-stat. = -4.39). Therefore, the *AH* companies have lower leverage, are less profitable, are less capital-intensive, have less concentrated ownership, fewer business segments, and less cash. Results for the remaining independent variables in Equation (7) are not statistically significant.

Next, we use the results from Equation (7) to match each observation in the strong sample to its closest match in the weak sample. To ensure close matches, we require the differences in their predicted probabilities to be less than 1 percent. We drop 39 matched pairs where the differences exceed 1 percent, leaving a sample of 331 observations in the strong sample (*WEAK* = 0) and 331 observations in the matched weak sample (*WEAK* = 1). Panel A of Table 8 reports the mean and median values for the dependent variables in the two samples. Consistent with our three hypotheses, the observations in the strong sample have more experienced partners (*EXPERIENCE*), a higher frequency of non-clean audit opinions (*OPINION*), and smaller signed accruals (*AWCA* and *DA_Jones*).

Table 8, Panel B reports the mean and median values in the two samples. The differences are generally insignificant, indicating that the propensity score matching procedure has achieved adequate covariate balance between the treatment and control groups, allowing us to better control for potential confounds (Armstrong, Jagolinzer, and Larcker 2010).¹⁹ We reestimate the models for *EXPERIENCE*, *OPINION*, *Ln(AF)*, *AWCA*, and *DA_Jones* using the matched sample. The results are reported in Panel C of Table 8. We continue to find significant negative coefficients on *WEAK* in the partner experience model (t-stat. = -2.06), the audit

¹⁸ We thank Tianyu Zhang for providing us with the data on political connections.

¹⁹ This matching procedure also helps to control for another alternative explanation. In particular, the *AH* companies are significantly less likely to switch to non-Big 4 auditors than are the *AB* and pure *A-share* companies. Accordingly, the Big 4 auditors of *AH* companies face a lower switch threat compared with the threat faced by the Big 4 auditors of *AB* and pure *A-share* companies. Matching helps to control for this because in the matched sample, the likelihood of a downgrade from a Big 4 auditor to a non-Big 4 auditor is found to be very similar in the treatment and control groups.

TABLE 8
Matched Propensity Scores Analysis

Panel A: Tests of Differences Between the Treatment Sample and the Matched Control Sample: Dependent Variables

| Variable | Strong Environment (n = 331; WEAK = 0) | | Weak Environment (n = 331; WEAK = 1) | | Tests for Differences in Means and Medians (p-values) | |
|-------------------|---|--------|---|--------|---|---------|
| | Mean | Median | Mean | Median | Means | Medians |
| <i>EXPERIENCE</i> | 58.011 | 57.813 | 54.475 | 53.869 | 0.02 | 0.01 |
| <i>OPINION</i> | 0.048 | 0.000 | 0.021 | 0.000 | 0.06 | — |
| <i>Ln(AF)</i> | 14.578 | 14.294 | 14.870 | 14.971 | 0.02 | 0.01 |
| <i>AWCA</i> | -0.005 | 0.001 | 0.019 | 0.013 | <0.01 | <0.01 |
| <i>DA_Jones</i> | -0.005 | -0.004 | 0.014 | 0.019 | <0.01 | <0.01 |

Panel B: Tests of Differences Between the Treatment Sample and the Matched Control Sample: Independent Variables

| Variable | Strong Environment (n = 331; WEAK = 0) | | Weak Environment (n = 331; WEAK = 1) | | Tests for Differences in Means and Medians (p-values) | |
|--------------------|---|--------|---|--------|---|---------|
| | Mean | Median | Mean | Median | Means | Medians |
| <i>SIZE</i> | 23.739 | 23.625 | 23.776 | 23.764 | 0.76 | 0.88 |
| <i>LEV</i> | 0.484 | 0.468 | 0.503 | 0.508 | 0.29 | 0.19 |
| <i>LOSS</i> | 0.097 | 0.000 | 0.121 | 0.000 | 0.32 | — |
| <i>ROE</i> | 0.095 | 0.099 | 0.086 | 0.111 | 0.43 | 0.22 |
| <i>RETURN</i> | -0.049 | -0.035 | -0.067 | -0.066 | 0.57 | 0.36 |
| <i>CURRENT</i> | 1.329 | 1.187 | 1.355 | 1.118 | 0.72 | 0.93 |
| <i>CASH</i> | 0.121 | 0.101 | 0.119 | 0.099 | 0.81 | 0.52 |
| <i>ARINV</i> | 0.253 | 0.232 | 0.289 | 0.283 | 0.02 | 0.01 |
| <i>SOE</i> | 0.970 | 1.000 | 0.979 | 1.000 | 0.46 | — |
| <i>SALESGROWTH</i> | 0.193 | 0.166 | 0.173 | 0.159 | 0.36 | 0.41 |
| <i>CFO</i> | 0.092 | 0.094 | 0.076 | 0.072 | 0.08 | 0.13 |
| <i>MB</i> | 2.788 | 2.255 | 2.564 | 1.978 | 0.16 | 0.03 |
| <i>VOL</i> | 0.026 | 0.020 | 0.024 | 0.019 | 0.28 | 0.20 |
| <i>NSUB</i> | 3.889 | 3.464 | 3.865 | 3.606 | 0.89 | 0.96 |
| <i>FOROPS</i> | 0.350 | 0.000 | 0.365 | 0.000 | 0.69 | — |
| <i>Ln(#SEG)</i> | 0.427 | 0.000 | 0.378 | 0.000 | 0.30 | 0.88 |
| <i>PC</i> | 0.526 | 1.000 | 0.541 | 1.000 | 0.70 | — |

Panel C: Second-Stage Models (H1, H2, H3)

| | Dependent Variable = | | | | |
|-------------|--------------------------|-----------------------|----------------------|--------------------|------------------------|
| | <u><i>EXPERIENCE</i></u> | <u><i>OPINION</i></u> | <u><i>Ln(AF)</i></u> | <u><i>AWCA</i></u> | <u><i>DA_Jones</i></u> |
| <i>WEAK</i> | -10.149 (-2.06)** | -3.811 (-2.14)** | -0.235 (-1.70)* | 0.046 (2.71) | 0.017 (2.10)** |

(continued on next page)

TABLE 8 (continued)

| | Dependent Variable = | | | | |
|------------------------|----------------------|----------------|---------------|-------------|-----------------|
| | <i>EXPERIENCE</i> | <i>OPINION</i> | <i>Ln(AF)</i> | <i>AWCA</i> | <i>DA_Jones</i> |
| <i>CONTROLS</i> | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes |
| n | 613 | 662 | 313 | 615 | 615 |
| Adj. R ² | 0.148 | 0.629 | 0.784 | 0.274 | 0.673 |

***, **, * Denote statistical significance at the 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively.

We use the same control variables as in Tables 4 to 6, but for brevity, these results are not reported. Standard errors are adjusted for clustering on each company.

Following Fernandes and Ferreira (2008), Doidge et al. (2009), and Hung et al. (2012), and Armstrong et al. (2010), we first estimate a probit model that explains a company's decision not to cross-list in Hong Kong. The results are as follows:

$$AH = 0.730^{***} SIZE - 0.761^{*} LEV - 0.933^{***} ROE + 0.060 LOSS + 0.042 MB + 0.052 SALES\ GROWTH + 0.863^{***} SOE - 0.991^{**} CAPE - 1.818^{***} LSHARE - 0.029 NSUB + 0.088 FOROPS - 0.329^{***} Ln(\#SEG) + 0.153^{**} CURRENT + 0.589 ARINV - 0.117 RETURN - 2.578^{***} CASH + 2.507 VOL + 0.221^{**} PC,$$

where $AH = 1$ if the company is cross-listed in Hong Kong (AH companies), and 0 otherwise; $SALES\ GROWTH$ = one-year growth rate in the company's sales revenue; $CAPE$ = capital expenditure divided by total assets; $LSHARE$ = stock ownership (%) of the company's largest shareholder; $PC = 1$ if the Chairman or CEO is a current or former officer of the central government, a local government, or the military, and 0 otherwise.

Next, we obtain the predicted probabilities from this model and find the closest match for each AH observation. To ensure that the observations are closely matched, we require the difference in the predicted probabilities to be less than 1 percent. We drop 39 matched pairs where the differences exceed 1 percent, leaving a sample of 331 observations in the strong sample ($WEAK = 0$) and 331 observations in the matched weak sample ($WEAK = 1$). The results are shown in this table (t-statistics and z-statistics are reported in parentheses).

See Table 1 for variable definitions.

opinion model (z-stat. = -2.14), and the audit fee model (t-stat. = -1.70).²⁰ Moreover, the $WEAK$ variable retains significant positive coefficients in the abnormal accruals models (t-stats. = 2.71, 2.10). Therefore, our results are robust to ensuring that the AH companies are appropriately matched to the pure A-share and AB companies based on their observable characteristics.

Notwithstanding that we have tried to address the endogeneity issue using the two approaches shown in Tables 7 and 8, we concede that it is impossible to completely rule out concerns about unobserved differences between the treatment and control groups. Therefore, we do not claim to have completely resolved the endogeneity issue.

VII. CONCLUSIONS

This study examines whether the weak institutional environment of China results in lower-quality audits by the Big 4. Unlike prior studies that use a cross-country approach, all of the

²⁰ In Panel A of Table 8, audit fees are found to be significantly lower for AH companies than for the matched control group. This univariate result is different from the regression result in Panel C, where we find that audit fees are significantly higher for AH companies. The results are different because the univariate test fails to control for the effect of $DOUBLE$, which is an important control variable in our regression analysis for two reasons. First, the $WEAK$ and $DOUBLE$ variables are negatively correlated because the AH and AB observations prepare two sets of financial statements, whereas the A-share observations prepare just one set of financial statements. Second, the $Ln(AF)$ and $DOUBLE$ variables are negatively correlated because it is less costly to audit the A-share financial statements if there is a concurrent audit of the B-share or H-share financial statements. These two negative correlations imply that failing to control for $DOUBLE$ in the univariate test biases the results. This problem of omitted variable bias is corrected in the regression analysis by controlling for the effects of $DOUBLE$.

observations in our sample come from mainland China. Thus, we avoid the problem of unobserved differences between countries (Miller 2004; Gul 2006). In our setting, the variation in the institutional environment comes from the mainland Chinese companies that are cross-listed in Hong Kong. We argue that the more demanding institutional environment of Hong Kong has a positive spillover effect on the quality of A-share audits for these AH companies. In contrast, because the AB and pure A companies are not cross-listed in Hong Kong, their A-share audits do not benefit from this spillover.

Consistent with these arguments, we find that the Big 4 assign less experienced partners to audit the pure A and AB companies. Further, the Big 4 are less likely to issue non-clean opinions and generally charge lower audit fees to the pure A and AB companies. Moreover, the pure A and AB companies have larger abnormal accruals. Overall, these findings indicate that the Big 4 offer lower-quality audits in mainland China when there is no positive spillover from Hong Kong. Contrary to Big 4 claims that they maintain a uniformly high level of quality, our findings suggest that their quality is lower when the institutional environment is weaker. Our findings are consistent with strong institutional environments and Big 4 audits being complements (Francis and Wang 2008) rather than substitutes (Choi et al. 2008).

Our study has important implications for the Securities and Exchange Commission (SEC) and the PCAOB, which are concerned about the quality of auditing in China. While the PCAOB is required to inspect overseas audit firms with U.S.-listed clients, China has barred the PCAOB from entering the country to inspect its mainland auditors. The absence of PCAOB inspections in China would be less important if it were the case that the Big 4 supply the same level of quality in China as they do in other jurisdictions. However, our results indicate this is not the case. Thus, regulators are rightly concerned about the absence of inspections even when audits are provided by the international Big 4 firms.

Further, our study offers an opportunity to understand how a strong institutional environment, such as Hong Kong, can affect companies originating from a weak environment, such as China. This is relevant to regulators in the U.S. that are struggling to monitor the quality of auditing in China. In particular, our results suggest that enforcement can be made more effective for U.S.-listed Chinese companies by requiring them to employ a Big 4 auditor in the U.S. This would likely result in higher audit quality and would also facilitate the PCAOB's role as an inspector.

The importance of our study is also borne out by recent developments in Hong Kong. Starting in 2010, companies cross-listed in Hong Kong are allowed to report under Chinese GAAP rather than Hong Kong international financial reporting standards (IFRS). This means that the AH companies are no longer required to provide two sets of financial statements and so they are no longer subject to a second Hong Kong audit. Our results indicate that this change in policy may forego the positive spillover that previously came from Hong Kong. Consistent with this, the media in Hong Kong have expressed concerns that cross-listed companies are no longer subject to Hong Kong audits and so enforcement against auditor malpractice is now solely in the hands of the mainland authorities (Yiu 2010; Lee 2011).

REFERENCES

- Allen, F., J. Qian, and M. Qian. 2005. Law, finance, and economic growth in China. *Journal of Financial Economics* 77 (1): 57–116.
- Anderson, D. 2000. Taking stock in China: Company disclosure and information in China's stock markets. *Georgetown Law Journal* 88 (6): 1919–1952.
- Armstrong, C., A. Jagolinzer, and D. Larcker. 2010. Chief executive officer equity incentives and accounting irregularities. *Journal of Accounting Research* 48 (2): 225–271.

- Ball, R., A. Robin, and J. Wu. 2003. Incentives versus standards: Properties of accounting numbers in four East Asian countries. *Journal of Accounting and Economics* 36 (1/3): 235–270.
- Bedard, J., E. Carson, and R. Simnett. 2011. *The Impact of Cross-Listing on Audit Fees: Disentangling the Effects of Litigation Risk and Audit Effort*. Working paper, UNSW Australia.
- Caramanis, C., and C. Lennox. 2008. Audit effort and earnings management. *Journal of Accounting and Economics* 45: 116–138.
- Carey, P., and R. Simnett. 2006. Audit partner tenure and audit quality. *The Accounting Review* 81 (3): 653–676.
- Chan, K. H., K. Z. Lin, and P. Mo. 2006. A political-economic analysis of auditor reporting and auditor switches. *Review of Accounting Studies* 11: 21–48.
- Chan, K. H., and D. Wu. 2011. Aggregate quasi rents and auditor independence: Evidence from audit firm mergers in China. *Contemporary Accounting Research* 28 (1): 175–213.
- Chen, C. J. P., S. Chen, and X. Su. 2001. Profitability regulation, earnings management, and modified audit opinions: Evidence from China. *Auditing: A Journal of Practice & Theory* 20 (2): 9–30.
- Chen, S., S. Y. J. Sun, and D. Wu. 2010. Client importance, institutional improvements, and audit quality in China: An office and individual auditor level analysis. *The Accounting Review* 85 (1): 127–158.
- Chen, Z., B. Ke, and Z. Yang. 2013. Minority shareholders' control rights and the quality of corporate decisions: A natural experiment from China. *The Accounting Review* 88 (4): 1211–1238.
- China Business Journal*. 2011. Cross-border regulatory supervision. Whose opportunity? *China Business Journal* (July 15).
- China Securities Regulatory Commission (CSRC). 2001. *Q&A No. 5 on the Requirements of the Financial Statement Reconciliation and Disclosure for Publicly Listed Firms that Prepare Financial Statements According to Both Domestic and Foreign Generally Accepted Principles*. (November 7). Beijing, China: CSRC.
- Choi, J-H., J-B. Kim, X. Liu, and D. Simunic. 2008. Audit pricing, legal liability regimes, and Big 4 premiums: Theory and cross-country evidence. *Contemporary Accounting Research* 25 (1): 55–99.
- Choi, J-H., J-B. Kim, X. Liu, and D. Simunic. 2009. Cross-listing audit fee premiums: Theory and evidence. *The Accounting Review* 84 (5): 1429–1463.
- Craswell, A. T., J. R. Francis, and S. Taylor. 1995. Auditor brand name reputations and industry specializations. *Journal of Accounting and Economics* 20 (3): 297–322.
- DeFond, M. L., T. J. Wong, and S. Li. 2000. The impact of improved auditor independence on audit market concentration in China. *Journal of Accounting and Economics* 28: 269–305.
- DeFond, M. L., and C. W. Park. 2001. The reversal of abnormal accruals and the market valuation of earnings surprises. *The Accounting Review* 76: 375–404.
- Doidge, C., G. A. Karolyi, K. V. Lins, D. P. Miller, and R. M. Stulz. 2009. Private benefits of control, ownership, and the cross-listing decision. *Journal of Finance* 64 (1): 425–466.
- Dong, M., and A. Stettler. 2011. Estimating firm-level and country-level effects in cross-sectional analyses: An application of hierarchical modelling in corporate disclosure studies. *The International Journal of Accounting* 46: 271–303.
- Fernandes, N., and M. Ferreira. 2008. Does international cross-listing improve the information environment? *Journal of Financial Economics* 88: 216–244.
- Francis, J. R., and D. Wang. 2008. The joint effect of investor protection and Big 4 audits on earnings quality around the world. *Contemporary Accounting Research* 25 (1): 157–191.
- Francis, J. R., and M. D. Yu. 2009. Big 4 office size and audit quality. *The Accounting Review* 84 (5): 1521–1552.
- Francis, J. R., and P. N. Michas. 2013. The contagion effect of low-quality audits. *The Accounting Review* 88: 521–552.
- Gul, F. 2006. Auditors' response to political connections and cronyism in Malaysia. *Journal of Accounting Research* 44 (5): 931–963.
- Gul, F., H. Sami, and H. Zhou. 2009. Auditor disaffiliation program in China and auditor independence. *Auditing: A Journal of Practice & Theory* 28 (1): 29–51.

- Gul, F., D. Wu, and Z. Yang. 2013. Do individual auditors affect audit quality? Evidence from archival data. *The Accounting Review* 88 (6): 1993–2023.
- Hay, D. C., W. R. Knechel, and N. Wong. 2006. Audit fees: A meta-analysis of the effect of supply and demand attributes. *Contemporary Accounting Research* 23: 141–191.
- Hung, M., T. J. Wong, and T. Zhang. 2012. Political considerations in the decision of Chinese SOEs to list in Hong Kong. *Journal of Accounting and Economics* 53: 435–449.
- Jones, J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29 (2): 193–228.
- Ke, B., and Y. Yu. 2006. The effect of issuing biased earnings forecasts on analysts' access to management and survival. *Journal of Accounting Research* 44: 965–999.
- Klein, B., and K. Leffler. 1981. The role of market forces in assuring contractual performance. *Journal of Political Economy* 89: 615–641.
- Lang, M., J. S. Raedy, and M. H. Yetman. 2003. How representative are firms that are cross-listed in the United States? An analysis of accounting quality. *Journal of Accounting Research* 41 (2): 363–386.
- Larcker, D., and T. Rusticus. 2010. On the use of instrumental variables in accounting research. *Journal of Accounting and Economics* 49 (3): 186–205.
- Lee, Y. 2011. Tsingtao brewery seeks shareholders' OK to dismiss foreign auditor. *Wall Street Journal*. Available at: <http://www.wsj.com/articles/SB10001424052748704803604576077571337390658>
- Lennox, C., and J. Pittman. 2010. Big Five audits and accounting fraud. *Contemporary Accounting Research* 27 (1): 209–247.
- Lennox, C., J. R. Francis, and Z. Wang. 2012. Selection models in accounting research. *The Accounting Review* 87 (2): 589–616.
- Lennox, C., X. Wu, and T. Zhang. 2013. *How do Audit Firms Assign Engagement Partners to Clients and What Are the Consequences for Audit Quality?* Working paper, Nanyang Technological University.
- Lennox, C., and B. Li. 2014. Accounting misstatements following lawsuits against auditors. *Journal of Accounting and Economics* 57: 58–75.
- Leuz, C. 2006. Cross listing, bonding and firms' reporting incentives: A discussion of Lang, Raedy and Wilson. *Journal of Accounting and Economics* 42: 285–299.
- Magnan, M. L. 2008. Discussion of: Audit pricing, legal liability regimes, and Big 4 premiums: Theory and cross-country evidence. *Contemporary Accounting Research* 25 (1): 101–108.
- Miller, G. S. 2004. Discussion of: What determines corporate transparency? *Journal of Accounting Research* 42 (2): 253–268.
- Moir, J. 2004. Andersen challenges Climax investigation. *South China Morning Post* (October 12). Available at: <http://www.scmp.com/article/473861/andersen-challenges-climax-investigation>
- Myers, J. N., L. A. Myers, and T. C. Omer. 2003. Exploring the term of the auditor-client relationship and the quality of earnings: A case for mandatory auditor rotation? *The Accounting Review* 78 (3): 779–799.
- Pistor, K., and C. Xu. 2005. Governing stock markets in transition economies: Lessons from China. *American Law and Economics Review* 7 (1): 184–210.
- Rovnick, N., and E. Yiu. 2009. Ernst & Young's US\$200m snag. *South China Morning Post* (October 12). Available at: <http://www.scmp.com/article/695114/ernst-youngs-us200m-snag>
- Seetharaman, A., F. Gul, and S. G. Lynn. 2002. Litigation risk and audit fees: Evidence from U.K. firms cross-listed on U.S. markets. *Journal of Accounting and Economics* 33: 91–115.
- The Accountant*. 2000. HKSA disciplinary probe can proceed. *The Accountant* (April 27).
- Wong, F. 2002. Andersen hit with share float probe. *The Standard* (January 3). Available at: http://www.thestandard.com.hk/news_detail.asp?art_id=875&con_type=1&sear_year=2002
- Wong, F. 2003. Accountants put Euro-Asia under scrutiny. *The Standard* (May 21). Available at: http://www.thestandard.com.hk/news_detail.asp?art_id=19422&con_type=1&sear_year=2003
- Yiu, E. 2010. Worries remain as mainland-only audits approved. *South China Morning Post* (December 11). Available at: <http://www.scmp.com/article/733021/worries-remain-mainland-only-audits-approved>