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The Consequences of Allowing Home Country Auditors to Audit Cross-listed Firms: Evidence from Hong Kong-listed H Share Firms

Manyi Fan[1], Bin Ke[2], Wenruo Wu[3], Lijun Xia[4], and Qingquan Xin[5]

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[1] Department of Accounting, NUS Business School, National University of Singapore, B01-03, 1 Business Link, Singapore 117592. Email: manyi.fan@u.nus.edu.

[2] Department of Accounting, NUS Business School, National University of Singapore, Mochtar Riady Building, BIZ 1, # 07-53, 15 Kent Ridge Drive, Singapore 119245.Tel: +65 6601 3133. Fax: +65 6773 6493. Email: bizk@nus.edu.sg.

[3] Antai College of Economics and Management, Shanghai Jiao Tong University, Shanghai, P.R. China 200030. Tel: +86-183 1707 8667. Email: wwrflying@sjtu.edu.cn.

[4] Antai College of Economics and Management, Shanghai Jiao Tong University, Shanghai, P.R. China 200030. Tel: +86-21-6293 2639. Email: ljxia@sjtu.edu.cn.

[5] Chongqing University. Email: xinqingquan@cqu.edu.cn.

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ABSTRACT

We examine the consequences of a 2010 Hong Kong regulation that allows, for the first time, companies incorporated in mainland China and cross-listed in Hong Kong (H share companies) to hire mainland domiciled auditors to audit their Hong Kong financial reports. We find that less than one third of the H share companies switched to mainland auditors. The switchers experience a decline in both audit fees and audit quality. Surprisingly, the non-switchers also experience a marginally significant decline in audit quality, consistent with the hypothesis that competition from mainland domiciled auditors could lead to a race to the bottom.

Key words: audit fees; audit quality; auditing regulation; cross-listed firms; auditor competition; China; Hong Kong

JEL: M41; M49; D43

1. Introduction

Cross listing has been a popular mechanism through which firms domiciled in home countries with weak investor protection raise equity capital from investors domiciled in host countries with strong investor protection.[1] However, due to severe information asymmetry between cross-listed firms from weak institutional environments and their investors in the host countries, the financial reporting quality of these cross-listed firms has always been a concern to regulators and investors (Chen et al. 2016). The recent admission of accounting fraud by Luckin Coffee, a Starbucks wannabe in China, and subsequent implosion of the firm's stock price once again reminded investors and regulators the challenges of conducting reliable due diligence on faraway companies. While securities regulators employ a variety of weapons to combat such risks, audit firms have been one of the critical gatekeepers in safeguarding the interests of cross-listed firms' investors. Accordingly, securities regulators around the world have spent considerable resources in regulating the behaviour of cross-listed firms' auditors.

There are two contrasting approaches to regulating the audit market of cross-listed firms. At one extreme, the securities regulators of a host country allow only the auditors domiciled in the host country to audit the books of cross-listed firms (hereafter referred to as approach one). At the other extreme, the securities regulators of a host country allow either the host country auditors or any eligible third-country auditors (typically home country auditors) approved by the host country regulators to audit the books of cross-listed firms (hereafter referred to as approach two). To our best knowledge, most countries including the U.S. adopts the second approach. However, Hong Kong adopted the first approach for mainland China incorporated H Share firms prior to 2010 and Singapore is considering to adopt the first approach.[2]

[1] For example, China's Alibaba raised a whopping USD25 billion in its IPO on NYSE on September 18, 2014. It was the largest IPO in the world before the listing of Saudi Arabia's giant state-owned oil company, Saudi Aramco, in 2019.

[2] See https://www.sgx.com/regulation/public-consultations/20200116-consultation-paper-enhancements-regulatory-regime-property.

Ex ante it is difficult to predict which regulatory approach can better serve the interests of cross-listed firms' investors because the auditors under the two contrasting approaches are subject to different incentives, local information advantage, and production cost function (Ke et al. 2015). To our best knowledge, there has been little research on the costs and benefits of adopting these two contrasting regulatory approaches.

The objective of this study is to shed light on this important issue by taking advantage of an exogenous Hong Kong regulatory regime change for the H share firms listed on the Hong Kong Stock Exchange. H share firms are mainland Chinese investor-controlled companies that are incorporated in mainland China but listed in Hong Kong. Prior to the regulatory regime change in 2010, H share companies were required by the Hong Kong Stock Exchange to prepare their financial reports under the International Financial Reporting Standards (IFRS) and be audited by a Hong Kong domiciled audit firm (i.e., approach one).[3,4] On December 10, 2010, the Hong Kong Stock Exchange announced the "*Consultation Conclusions on Acceptance of Mainland Accounting and Auditing Standards and Mainland Audit Firms for Mainland Incorporated Companies Listed in Hong Kong*" that would allow H share companies to use mainland Chinese accounting and auditing standards and mainland Chinese audit firms for the purposes of Hong Kong reporting (i.e., approach two).[5] The new regime took effect for the H share companies whose annual accounting periods ended on or after December 15, 2010. Subsequently China's Ministry of Finance (MOF) allowed 12 largest mainland Chinese audit firms (including the Big Four affiliates in mainland China) to be eligible to audit the H share

[3] Hong Kong Financial Reporting Standards (HKFRS) were fully converged with IFRS starting with annual reporting periods commencing from 1 January 2005 (IFRS Foundation 2018).

[4] Prior to 2010, if an H share company was also listed on a mainland China's stock exchange (referred to as an AH firm), the firm would also be required to prepare another set of financial reports based on mainland China's GAAP and audited by a mainland Chinese audit firm for mainland Chinese investors.

[5] Since 2007 mainland China's accounting standards have been substantially converged with the IFRS. In December 2007, the China Accounting Standards Committee and the Hong Kong Institute of Certified Public Accountants (HKICPA) jointly declared that the accounting standards in mainland China and Hong Kong have been substantially converged, after a line-by-line examination by professional accountants and auditors across the borders (Chan 2008). The 2007 annual reports of AH firms prepared under the mainland Chinese GAAP and the Hong Kong GAAP showed almost no differences (Chu 2008).

companies for the purposes of Hong Kong reporting.[6] We investigate two specific research questions: (1) which types of H share companies would switch to mainland auditors? (2) What are the effects of the regulation on H share companies' audit fees and audit quality?

We start our empirical analyses by analysing whether any existing H share companies switched to mainland Chinese auditors after the regulation. Ex ante the answer is unclear because switching entails both costs and benefits. For example, switching to mainland auditors could allow an H share firm to save audit costs due to mainland auditors' lower audit production costs and local information advantage. On the other hand, Hong Kong auditors are regarded as higher quality auditors due to the stronger regulatory enforcement and market institutions (Ke et al. 2015) and therefore switching to mainland auditors could send a negative signal to the capital market and increase an H share firm's future capital raising costs. There were a total of 144 H share companies immediately prior to the 2010 regulation change. 66% (92%) of the H share companies in 2009 were audited by the Big Four based on the number of audit clients (based on the total assets of audit clients). From 2009 to 2015, our last sample year, the market share of the Hong Kong auditors as a whole dropped from 100% to 68% based on the number of audit clients and from 100% to 84% based on the total assets of audit clients, suggesting that larger audit clients are less likely to switch to mainland auditors. The market share of the Hong Kong Big Four dropped from 66% to 44% based on the number of audit clients and 92% to 76% based on the total assets of audit clients. The comparable market share changes for the Hong Kong non-Big Four are 34% to 24% based on the number of audit clients and 8% to 8% based on the total assets of audit clients. Overall, these results show that the Hong Kong auditors still hold the majority share of the H share market, especially in the audit market of the larger H share companies.

[6] The 12 mainland auditors include PricewaterhouseCoopers Zhong Tian (i.e. PwC China), Deloitte Huayong (i.e. Deloitte China), KPMG Huazhen (i.e. KPMG China), Ernst & Young Hua Ming (i.e. Ernst & Young China), BDO China Shu Lun Pan (i.e. BDO China), Pan-China, Shu Lun Pan Da Hua, ShineWing, Crowe Horwath China, RSM China, Grant Thornton China and WUYIGE.

We next examine the determinants of the H share companies' switching decisions following the regulation change. The first factor we consider is the expected audit fee saving resulting from the auditor switch because one of the Hong Kong Stock Exchange's motivations for the 2010 regulatory change was to reduce H share companies' compliance costs and facilitate mainland Chinese companies' capital raising in Hong Kong (HKEx 2009; Zheng 2011). The second factor we consider is managerial incentives. Following Fan and Wong (2005), we use the wedge between a firm controlling shareholder's voting rights and cash flow rights as a proxy for managerial incentives. The third factor we consider is a firm's external financing needs (Durnev and Kim 2005). Due to the significant differences in the legal environments between Hong Kong and mainland China, some market observers expressed concerns that the regulation reform would erode investors' confidence in the quality of Hong Kong's capital markets (O'Keeffe 2011; Lee 2009). We find that H share firms that expect greater audit fee saving are more likely to switch to mainland auditors after the regulation. We find no evidence that H share firms' wedge affects the switching decision, but we find that H share firms with greater external financing need are less likely to switch. Overall, these results suggest that the management of H share companies considers both the benefits (i.e., expected audit fee saving) and costs (i.e., cost of capital) when deciding to switch or not.

Our second research question investigates the impact of the regulation on H share companies' audit fees and audit quality. Follow prior research (e.g. DeFond et al. 2000; Chen et al. 2001), we use audit opinion as the proxy for audit quality. To control for potential confounding effects, we use the Red Chip firms, which are not subject to the regulation change, as our control sample in our difference-in-differences research design. Red Chip firms are

defined as mainland Chinese investor-controlled firms that are incorporated outside mainland China and listed on the Hong Kong Stock Exchange.[7]

Because the regulation change applies to all H share companies, we first examine the impact of the regulation change on all H share companies as a whole. We find that, compared with Red Chip firms, H share companies experience a significant reduction in both audit fees and audit quality after the regulation change.

To identify the sources of the reduction in audit fees and audit quality, we also examine the impact of the regulation change on the H share companies that switch to mainland auditors after the regulation (the switchers) and the H share companies that continue to employ Hong Kong auditors after the regulation (the non-switchers). We find that the audit fee reduction for the full sample is attributed to the switchers only. We find no evidence that the non-switchers experience a reduction in audit fees following the regulation. However, we find that the reduction in audit quality for the full sample is attributed to both the switchers and non-switchers. The fact that the non-switchers also experience an audit quality reduction in the post-regulation period suggests that introducing the mainland Chinese auditors into the Hong Kong audit market put a competitive pressure on the incumbent Hong Kong auditors, resulting in a race to the bottom. It is interesting to note that the channel through which this competitive pressure manifests is audit quality rather than audit fees. One interpretation of this finding is that incumbent Hong Kong auditors and their audit clients are reluctant to reduce the audit fees because such reductions would be highly visible to stock market investors. On the other hand, audit quality is a classic example of credence goods (Dulleck and Kerschbamer 2006; Causholli and Knechel 2012) and therefore any compromise in audit quality would not raise immediate alarm among investors.

[7] As shown in section 3, we find no evidence that the auditors of Red Chip firms are affected by the 2010 regulation change.

We contribute to two streams of existing literature. Our first contribution is to the literature on audit firm regulation. Most studies in the literature focus on audit firm regulation within one single jurisdiction (e.g. the studies on the effect of Sarbanes-Oxley Act). Since the establishment of the PCAOB, the regulation of auditors across jurisdictions has attracted growing interest around the world, partially due to the PCAOB's limited ability to inspect foreign domiciled auditors (e.g. PCAOB 2010; SEC 2018). However, most studies take the existing U.S. auditing regulatory regime as given and instead focus on the operations and effectiveness of the PCAOB. In contrast, our study examines the costs and benefits of two alternative approaches to regulating auditors across different jurisdictions.

Second, we contribute to the ongoing debate on the effect of audit market competition on audit quality. Due to the increasing concentration of the audit market in many countries, policy makers around the world have shown a great interest in understanding the degree of audit market competition and the effect of competition on audit firm behavior (e.g., Pickard and Marriage 2018). The existing literature has tackled this issue using different approaches. Many studies examine the relation between *endogenous* audit market concentration and audit fees and/or audit quality and report mixed results.[8] Other studies analyze the effect of audit market competition using audit firm mergers (e.g. Sullivan 2002; Ivancevich and Zardkoohi 2000; McMeeking et al. 2007; Gong et al. 2016; Choi et al. 2017; Chen et al. 2018). However, audit firm mergers could be endogenous. In addition, the relation between audit firm mergers and competition is ambiguous because mergers per se could reduce competition resulting from fewer competitors but the synergies created from audit firm mergers could lead to greater audit market competition (Gong et al. 2016; Kitto 2019; Sullivan 2002). To deal with the endogeneity

[8] For the relation between audit market competition and audit fees, some studies find a negative relation (e.g. Ettredge and Greenberg 1990; Bandyopadhyay and Kao 2004; Kallapur et al. 2010; Dunn et al. 2013; Keune et al. 2015; Ettredge et al. 2018; Huang et al. 2016). However, Pearson and Trompeter (1994) find a positive relation. For the relation between audit market competition and audit quality, some studies find a negative relation (e.g. Kallapur et al 2010; Newton et al. 2013; Dunn et al. 2013; Newton et al. 2016) but other studies find a positive relation (e.g. Boone et al. 2012; Cziffra et al. 2019).

of audit market competition, a few studies have used relatively exogenous shocks such as the collapse of Arthur Anderson (Geng et al. 2018) and regulation changes (e.g., Jensen and Payne 2005; Cheng et al. 2019). All of these studies focus on competition among audit firms operating within one single jurisdiction. We contribute to this literature by showing how a regulatory change that increases the competition from potentially lower quality auditors from another jurisdiction affects the incumbent auditors' audit quality.

The findings from our study are also relevant to policy makers in both Hong Kong and mainland China. While the 2010 regulation covers more issues than considered in this study, audit quality has attracted the most attention of the media. Even though some commentators highlight the potential benefits (e.g., attracting more mainland firms to list in Hong Kong, reduced compliance costs and increased market efficiency) of the regulation (Dongfang Daily 2010; Li 2010), many commentators express a concern on the potential negative effect of the regulation on audit market competition and H share firms' audit quality (Wenhui Daily 2010; Yam 2009). Our study provides direct evidence on this important question. Our results suggest that the regulatory approach adopted by Hong Kong regulators prior to 2010 (i.e., approach one) seems more effective than the existing U.S. approach (i.e., approach two) in improving the audit quality of cross-listed firms while avoiding the difficulty that the PCAOB has encountered in inspecting foreign auditors from foreign jurisdictions (Carcello et al. 2014; He et al. 2017). However, we also wish to note that our study does not speak to the overall optimality of the two approaches because we could not quantify all costs and benefits of the two approaches.

The rest of the paper is organized as follows. Section 2 analyzes the H share firms' auditor switching decision after the regulation. Section 3 examines the impact of the regulation on audit fees and audit quality for all H share firms as a whole. Section 4 considers the impact of the regulation for the switchers and non-switchers. Section 5 concludes.

2. H share firms' auditor choice after the regulation

Before analyzing the impact of the regulation on audit fees and audit quality, we first examine H share firms' auditor switching decisions. Section 2.1 examines how the regulation affects the Hong Kong auditors' market share of the H share firms after the regulation. Section 2.2 investigates the role of three important factors, audit fee saving, managerial agency conflict, and external financing need, in explaining H share firms' auditor choice after the regulation.

2.1.Market share of Hong Kong auditors after the regulation

Prior to adoption of the 2010 regulation, the Hong Kong auditors owned 100% of the H share audit market. Hence, it is almost guaranteed that the Hong Kong auditors' market share of H share firms will decline after the regulation. However, less certain is the magnitude of the decline.

Figure 1 plots the distribution of the timing of the H share firms' switching to mainland auditors. As expected, there is a spike of switches right after the regulation. Nevertheless, there is still a significant number of switches after 2011.

Table 1 shows the market share of the Hong Kong auditors before versus after the regulation. We use the year immediately before the regulation to measure Hong Kong auditors' market share of the H share firms in the pre-period. Since H share firms' auditor switching decisions could take time, we measure Hong Kong auditors' market share in the post-period as of the end of 2015, more than five years after the regulation's passage. We also decompose the Hong Kong auditors into two groups: The Big Four and the non-Big Four. We measure the market share using two different methods: the number of audit clients (equal weighting) and the total assets of the audit clients (value weighting).

Looking at the Hong Kong auditors as a whole, we find that the Hong Kong auditors' market share of the H share firms dropped from 100% to 68% based on the number of audit

clients and from 100% to 84% based on the total assets of audit clients. These numbers suggest that the Hong Kong auditors still retained the majority of the H share audit clients after the regulation. In addition, the difference in the equally weighted and value weighed percentages suggests that the lost audit clients are smaller H share firms.

Table 1 shows that 66% (92%) of the H share companies are audited by the Hong Kong Big Four in the pre-period based on the number of audit clients (based on the total assets of audit clients), suggesting that the Hong Kong Big Four dominated the H share audit market in the pre-period, especially for the larger H share firms. The Hong Kong Big Four's market share of the H share firms dropped to 44% (76%) in the post-period based on the number of audit clients (based on the total assets of audit clients). In terms of number of clients, the Hong Kong Big Four no longer dominated the H share audit market in the post-period, but in terms of the total assets of audit clients, the Hong Kong Big Four still held the majority of the H share audit market in the post-period.

The Hong Kong non-Big Four's market share of the H share firms dropped from 34% (8%) to 24% (8%) after the regulation based on the number of audit clients (based on the total assets of audit clients). While the Hong Kong non-Big Four lost some audit clients, its market share based on the total assets of H share firms remained the same. Hence, the descriptive statistics in Table 1 suggest that the regulation exerts a larger impact on the Hong Kong Big Four than on the Hong Kong non-Big Four.

2.2. Determinants of H share firms' auditor choice after the regulation

2.2.1. Hypotheses

After the adoption of the 2010 regulation, each H share company has two choices: keep the existing Hong Kong audit firm or switch to a mainland Chinese audit firm. Each choice entails a tradeoff of costs and benefits. One potential advantage for an H share firm to switch to a

mainland audit firm is to pay lower audit fees because mainland Chinese audit firms tend to have a cost advantage. In addition, mainland Chinese auditors may also have a local information advantage and therefore they could conduct their audits more efficiently (Wang et al. 2008). Therefore, holding everything else constant, we expect the H share firms to be more likely to switch to mainland auditors if they could reduce audit fees from the switch. This discussion leads to the following hypothesis stated in its alternative form:

H1: Expected audit fee saving is positively associated with H share companies' switch to mainland Chinese auditors.

Due to mainland China's weaker institutional environment, mainland Chinese auditors may be less independent than Hong Kong auditors (Ke et al. 2015). Hence, H share companies that suffer from greater managerial agency problems could have a stronger incentive to switch to a mainland audit firm so that these companies' insiders could enjoy greater flexibility in earnings management. However, auditor switching is publicly observable. Hence, an H share firm with the suspicion of severe managerial agency problems may refrain from switching to a mainland audit firm because the switch could fully reveal the firm type, resulting in the capital market's discount of the firm's earnings (Fan and Wong 2005). For this reason, H share firms with greater agency problems do not necessarily have stronger incentives to switch to mainland Chinese auditors. Because of the ambiguity of this prediction, we state the following hypothesis in the null form:

H2: Managerial agency conflicts are not associated with H share companies' switch to mainland Chinese auditors.

While all H share companies may hesitate to switch to mainland Chinese auditors for the fear of the capital market's negative reaction to the switch, the H share companies that are

expected to raise future equity capital should be more likely to refrain from the switch (Fan and Wong 2005). This argument leads to the following hypothesis stated in the alternative form:

H3: H share companies that are expected to raise equity capital are less likely to switch to mainland Chinese auditors.

An implicit assumption for H2 and H3 is that mainland Chinese audit firms have lower incentives to maintain high quality audit standards than Hong Kong domiciled audit firms. Recognizing such potential differences between the two financial markets, the regulators on both sides had adopted various policies to mitigate such risks. For example, only the 12 largest and strongest mainland Chinese audit firms were allowed to audit H share firms, reducing the risk of excessive competition from low quality mainland audit firms. China's Ministry of Finance (MOF) also implemented the following key policies to help strengthen the audit quality of the 12 selected audit firms (MOF 2011). First, MOF required the audit firms to be transformed from LLC to LLP. Second, the MOF required the audit firms to strengthen their internal controls and audit quality controls. Third, the MOF required the audit firms to develop internationalized human capital. Fourth, the MOF adopted a continuous monitoring mechanism so that any audit firm that fails to maintain high quality audit standards would lose the license to audit H share firms. Because of these enhanced regulatory policies, it is possible that there are no longer significant differences in audit quality between the Hong Kong domiciled audit firms and the 12 selected mainland Chinese audit firms.

2.2.2. Research design

We use a Cox proportional hazard regression to study H share firms' audit firm choice following the regulation. As the regulation took effect for the H share firms whose fiscal periods ended on or after December 15, 2010, the hazard analysis sample starts from the beginning of the fiscal year 2010 and ends in the year of switching to a mainland audit firm or 2015 (the end

of our sample), whichever is earlier. See Panel A of Table 2 for the detailed sample selection procedures.

Our key variables of interest are expected audit fee saving (*FEESAVING*), the managerial agency conflict proxy (*WEDGE*), and two proxies for future equity financing need (*INVEST_OPP* and *EXTERNAL_FIN*) per Durnev and Kim (2005) and Demirguc-Kunt and Maksimovic (1998). *FEESAVING* is the difference between the expected audit fees if employing a Hong Kong audit firm and the expected audit fees if switching to a mainland Chinese audit firm. Please refer to appendix A for the detailed construction of *FEESAVING*. Higher values of *FEESAVING* represent greater expected audit fee saving from switching to a mainland audit firm and therefore the coefficient on *FEESAVING* is predicted to be positive under H1. *WEDGE* measures the difference between the controlling owner's voting rights and cash flow rights. Following Gong et al. (2013), *WEDGE* is a dummy variable that equals one if the controlling owner's voting rights are larger than cash flows rights and the voting rights of the controlling shareholder is greater than 10%. Inferences are similar if we use a cutoff of 20%. Following Durnev and Kim (2005) and Demirguc-Kunt and Maksimovic (1998), we define a company's investment opportunity set (*INVEST_OPP*) as the 2-year geometric average of the annual percentage growth in net sales and a firm's demand for external equity financing using *EXTERNAL_FIN*, which is the difference between the firm's actual growth rate and the sustainable growth rate with retained earnings and short-term and long-term debt financing that maintains a constant debt-to-assets ratio. We estimate a company's actual growth rate as a 2-year geometric average of the annual growth rate in total assets, and the sustainable growth rate as a 2-year average of ROE/(1-ROE), whether ROE is the return on equity. H3 predicts that H share firms with higher values of *INVEST_OPP* and *EXTERNAL_FIN* to be less likely to switch to mainland Chinese auditors.

Following prior research (Copley and Douthett 2002; Willenborg 1999; Weber and Willenborg 2003; DeFond et al. 2000; Fan and Wong 2005), we control for the following variables in the hazard model: company size (*SIZE*), performance (*ROE*), risk (*LEV* and *CURRENT*), audit complexity (*NSUB* and *ARINV*), and industry fixed effects. Since state ownership affects companies' auditor choice (Wang et al. 2008), we control for whether a company is a SOE or not (*SOE*). We also control for whether the company is audited by a Hong Kong Big Four audit firm in the prior year ($BIG4_{t-1}$). Following Francis and Wilson (1988), we also include changes in company characteristics, including change in company size (*ΔSIZE*), change in performance (*ΔROE*), change in risk (*ΔLEV* and *ΔCURRENT*) and change in audit complexity (*ΔNSUB* and *ΔARINV*).

2.2.3. Regression results

Panel B of Table 2 shows the descriptive statistics for the regression variables used in the hazard model. We show the results for the switchers and non-switchers separately.

Panel C of Table 2 shows the hazard regression results. Consistent with H1, the coefficient on *FEESAVING* is significantly positive, suggesting that H share firms are more likely to switch to mainland auditors if they expect greater audit fee saving from the switch. As a robustness check, we also use two alternative audit fee saving proxies defined in Appendix A, *FEESAVING2* and *AH*. As shown in Table 2, both coefficients are significantly positive.

With regard to managerial agency conflicts (H2), we find that the coefficient on *WEDGE* is insignificant, suggesting no evidence that H share firms with larger wedge are more likely to switch to mainland Chinese auditors.

With regard to external financing need (H3), we find that the coefficient on *INVEST_OPP* is significantly negative while the coefficient on *EXTERNAL_FIN* is negative but insignificant. Hence, we find some support for H3.

3. The impact of the regulation for all H share firms

We now examine the impact of the regulation on audit fees and audit quality. As the regulation applied to all H share companies, we first analyze the impact of the regulation for all H share firms as a whole in this section. Section 4 examines the impact of the regulation for the switchers and non-switchers separately in order to identify the sources of the observed changes in section 3.

3.1. Hypotheses

The incumbent Hong Kong auditors could respond to the shock of the regulation in two ways: adjust the audit fees or the audit quality. Facing the competition from the mainland audit firms, the incumbent Hong Kong audit firms could reduce either audit fees or audit quality or both. Ex ante it is difficult to predict the incumbent Hong Kong audit firms' preferred response.

We first analyze the impact of the regulation on audit fees. As shown in section 2, the regulation creates two types of H share firms in the post-period: the H share firms who switch to mainland auditors (switchers) and the H share firms who choose to retain the Hong Kong auditors (non-switchers). Table 2 shows that the H share firms that expect more audit fee saving from the switch are more likely to switch. Hence, we expect the audit fees of the switchers to decline after the regulation. On the other hand, the impact of the regulation on the audit fees of the non-switchers is ambiguous. One possibility is that the non-switchers do not experience any change in audit fees after the regulation because they continue to employ the same Hong Kong auditors, ceteris paribus. Another possibility is that introducing the 12 mainland Chinese auditors creates a competitive pressure on the incumbent Hong Kong auditors and therefore the latter could be forced to lower the audit fees in order to retain the H share clients. Because the majority of the H share firms do not switch to mainland auditors (see Table 1), it is difficult to

predict the impact of the regulation on the audit fees of the H share firms as a whole. Hence, we state the following hypothesis in the null form:

H4: there is no change in the H share firms' audit fees after the passage of the regulation.

Next, we examine the impact of the regulation on the H share firms' audit quality. Again, we analyze the impact of the regulation for the switchers and non-switchers separately. For the switchers, there are two possible outcomes. One possibility is that the switchers suffer from more severe agency problems and therefore they switch to mainland Chinese audit firms who are willing to compromise audit quality. Another possibility is that due to the potential negative signaling effect of auditor changes, the switchers are not necessarily firms who demand lower quality audit. Therefore, the switchers' audit quality may not decline after the regulation.

For the non-switchers, there are three possibilities with regard to the impact of the regulation on audit quality. First, the non-switchers' audit quality does not change after the regulation because they employ the same Hong Kong auditors. Second, the competition from the 12 mainland Chinese auditors pressure the incumbent Hong Kong auditors to cave in to the demand for lower audit quality by H share firms' management (Shleifer 2004). Third, H share firms' management demand high quality audit and therefore the entry of the mainland Chinese auditors has little impact on the incumbent Hong Kong auditors because the mainland auditors are still viewed as lower quality auditors by Hong Kong investors.

Because of these conflicting possibilities, we state the following hypothesis in the null form:

H5: there is no change in the H share firms' audit quality after the passage of the regulation.

3.2. Research design

We use the following difference-in-differences research design to test H4:

$$AF_{it} = \alpha + \beta_1 POST1_t \times HSHARE_i + \beta_2 Controls_{it} + \mu_i + \mu_t + \varepsilon_{it} \quad (1)$$

To control for potential confounding effects, we use Red Chip firms as a control sample. Both H share firms and Red Chip firms are mainland Chinese investors-controlled firms and have their major business operations in mainland China. Therefore, both types of firms are subject to similar political, economic and legal environments. However, Red Chip firms are not subject to the 2010 regulation and therefore can serve as good control firms. $HSHARE_i$ equals one for H share firms and zero for Red Chip firms. AF_{it} is the natural log of the inflation-adjusted audit fees of firm *i* for financial reporting of year *t*. $POST1_t$ equals one if the fiscal year end is on or after December 31, 2010, and zero otherwise.

Following Ke et al. (2015) and Ireland and Lennox (2002), we include several control variables, including company size (*SIZE*), financial health (*LEV, LOSS, ROE*), audit complexity (*NSUB*, *CURRENT* and *ARINV*), indicator of whether the auditor is a Big Four audit firm (*BIG4*), an indicator for AH company (*AH*), and an indicator for SOEs (*SOE*). Year and firm fixed effects (μ_t and μ_i respectively) are included.

It is important to note that the definition of year in the difference-in-differences model is different from calendar year or fiscal year. The reason is that the fiscal year end for all H share firms are December 31, but the fiscal year ends of the Red Chip companies are not always December 31. Because the 2010 regulation took effect for the accounting periods ending on or after December 15, 2010, using either calendar year or fiscal year would misclassify a small number of firm years into the wrong pre- or post- period. To illustrate, let's assume that firm A's fiscal year end is November 30, 2010 and firm B's fiscal year end is December 31, 2010. Hence, both firms belong to the same fiscal year 2010 or calendar year 2010, even though firm A belongs to the pre-period while firm B belongs to the post-period. To deal with this issue, we redefine year as follows: we set year T=0 for the first fiscal year after the regulation. Then we define all the other fiscal years of the same firm accordingly relative to year T. For the above

two examples, year T=0 is the fiscal year ending on November 30, 2011 for firm A and the fiscal year ending on December 31, 2010 for firm B.

To test H5, we use the same difference-in-differences research design for H4 except that the dependent variable is audit quality. Following DeFond et al. (2000) and Ke et al. (2015), audit quality is measured using $OPINION_{it}$, which equals one if the audit opinion for the Hong Kong reporting is non-clean, and zero otherwise. Following Ke et al. (2015), we control for the following variables: accounting performance (*LOSS*), profitability (*ROE*), liquidity (*CURRETN*, *CASH* and *ARINV*), company size (*SIZE*), leverage (*LEV*), state ownership (*SOE*), annual market-adjusted abnormal returns (*RETURN*). We also control for whether the company is audited by a Big Four audit firm (*BIG4)* as Big Four audit firms could be more likely to issue non-clean opinions. We also control for log of the number of years a company has been listed on the Hong Kong Stock Exchange (*AGE*) as Chinese firms are more susceptible to financial distress after they have exhausted the capital raised in initial public offerings, and younger firms are less likely to receive modified audit opinions (Chan and Wu 2011; DeFond et al. 2000). Year and firm fixed effects (μ_t and μ_i respectively) are included.

3.3. Regression results

Table 3 shows the sample selection procedures for our H4 and H5 tests. The sample for the difference-in-differences research design starts from 2006, one year after Hong Kong adopted IFRS. The sample ends in 2015, the end of our sample collection period. To create a relatively balanced sample, we require each firm to have observations for at least one year before and after the regulation. The final sample for the *AF* regression contains 138 unique H share firms and 352 unique Red Chip firms while the final sample for the *OPINION* regression contains 144 unique H share firms and 354 unique Red Chip firms.

Table 4 shows the regression results for H4. Panel A reports the summary statistics for the regression variables for the pre- and post- periods for the H share firms and Red Chip firms separately. The H share firms' mean *AF* is 14.954 in the pre-period and 15.121 in the post-period, while the Red Chip firms' mean *AF* is 14.398 in the pre-period and 14.663 in the post-period. Hence, the univariate statistics do not show significant change of H share firms' audit fees after the regulation. Panel B shows the OLS regression results. Most of the control variables' coefficients are significant and as predicted. The coefficient on *POST1*×*HSHARE* is significantly negative (two-tailed p=0.056). This result suggests that after controlling for the other determinants of audit fees, the H share firms paid lower audit fees after the regulation.

Table 5 shows the regression results for H5. As shown in Panel A, The H share firms' mean *OPINION* is 10.5% in the pre-period and 5.7% in the post-period, while the Red Chip firms' mean *OPINION* is 12.3% in the pre-period and 13.3% in the post-period. Hence, the univariate statistics show visible decline of H share firms' modified audit opinions after the regulation.

Panel B shows the regression results. Because the dependent variable is a dummy variable, we report both the OLS regression results and the conditional logit regression results because linear regression model's coefficients are easier to interpret. Many of the control variables' coefficients are significant and as predicted. The coefficient on *POST1*×*HSHARE* is significantly negative for both the OLS regression and the conditional logit regression at the two-tailed 5% significance level. This result suggests that after controlling for the other determinants of audit opinions, the H share firms are less likely to receive modified audit opinions after the regulation, suggesting that the H share firms' auditors become less independent after the regulation.

3.4. Robustness checks

We perform several robustness checks to rule out potential alternative explanations for the results in Tables 4 and 5. First, we check the parallel trends assumption for the difference-in-differences regression models. Specifically, we create a pseudo-event dummy variable *PSEUDO_POST1* that equals one for the two years immediately before the regulation and zero for the all the other years in the pre-period (i.e., the observations with *POST1*=0). Then, we estimate a difference-in-differences model similar to model (1) for *PSEUDO_POST1* using the pre-period sample. Table 6 reports the regression results. For brevity, we have omitted the coefficients on the control variables in Table 6. The coefficient on *PSEUDO_POST1*×*HSHARE* is insignificant for both *AF* and *OPIONION*, suggesting no violation of the parallel trends assumption.

Second, we rule out one alternative explanation for the audit opinion results in Table 5. Specifically, one could argue that the audit opinions issued by the Hong Kong domiciled audit firms are excessively conservative due to lack of understanding of H share firms. In contrast, one could argue that mainland Chinese auditors have a much better understanding of H share firms and therefore the H share firms' reduced frequency of modified audit opinions after the regulation could reflect mainland auditors' better understanding of the switched H share firms rather than lower audit quality. To rule out this explanation, we break *HSHARE* into two subgroups: H share firms that also had listed A shares prior to the regulation (*PRE_AH*) and H share firms that had no listed A shares prior to the adoption of the 2010 regulation (*PRE_H*). Then, we rerun the difference-in-differences audit opinion regression model using *PRE_AH* and *PRE_H* instead of *HSHARE*. If our audit opinion results in Table 5 are due to mainland auditors' local information advantage, we should expect the coefficient on *POST1*×*PRE_AH* to be less negative than the coefficient on *POST1*×*PRE_H*. This is because the *PRE_AH* firms had already had mainland auditors' local information advantage in the pre-period and therefore these firms should not be affected by this alternative explanation. Specifically, prior to the

adoption of the 2010 regulation, most of the AH firms hired a Big Four for the audit of both sets of financial reports, with the Hong Kong office of the Big Four responsible for the H share report and the mainland office of the *same* Big Four responsible for the A share report. As explained by Ke et al. (2015, footnote 7), the two sides generally form a joint audit team and the Hong Kong office typically sends senior members of its staff to oversee the joint fieldwork conducted in mainland China by the mainland Chinese auditors. Following the adoption of the 2010 regulation, some AH firms could choose to keep only the mainland office of the Big Four as their auditors. As the audit fieldwork is performed by the same mainland auditors for the pre- and post-regulation periods, the information advantage of the AH firm auditors over the two periods should not change.

Table 7 shows the regression results for this alternative explanation. Inconsistent with this alternative explanation, we find no evidence that the coefficient on *POST1*×*PRE_AH* is less negative than the coefficient on *POST1*×*PRE_H*.

Third, we examine whether the behaviour of Red Chip firms' Hong Kong auditors is *indirectly* affected by the 2010 regulation and as a result our inferences in Tables 4 and 5 could be affected. Specifically, one could argue that Hong Kong domiciled auditors' loss of H share firms could increase the Hong Kong auditors' market competition for Red Chip firms who share many similarities with H share firms and serve as good substitutes for the lost H share firm clients. To test this hypothesis, we use the Hong Kong listed firms included in the Hang Seng Composite Stock Index (excluding the H share firms, Red Chip firms and financial firms) as control firms (referred to as Hong Kong firms). Then, we repeat the same regression models in Tables 4 and 5 for the Red Chip firms versus Hong Kong firms. We find no evidence that the coefficient on *POST1*×*REDCHIP* (where *REDCHIP* is one for Red Chip firms and zero for Hong Kong firms) is significantly different from zero for both models (untabulated). Hence,

we find little evidence that the 2010 regulation has a spillover effect on the audit market competition for the Red Chip firms.

4. The impact of the regulation for the switchers and non-switchers

We next examine whether the documented effects of the regulation on audit fees and audit opinions in Tables 4 and 5 are attributed to the switchers or non-switchers or both. For the non-switchers, we can continue to use *POST1* to define the pre- and post- periods. But the definitions of pre- and post- periods are more complicated for the switchers because the switching event may not occur in the same time immediately after the regulation for all the switchers. To illustrate, let's assume a switcher made the switching decision in year T=+3, where T=0 is defined as in section 3.2. Therefore, we decompose *POST1* into two components for the switchers: *POST2* for the years T=0 to T=+2 and *POST3* for the years on and after T=+3. The sum of *POST2* and *POST3* is equal to *POST1*. This way we can separately assess the impact of the regulation for the switchers in the *POST2*=1 and *POST3*=1 periods separately.

Table 8 shows the regression results of *AF* for the switchers and non-switchers. For both regression models in Table 8, the control firms are always the Red Chip firms. We find that the coefficient on *POST1*×*NON_SWITCHER* is insignificant. On the other hand, the coefficient on *POST3*×*SWITCHER* is significantly negative while the coefficient on *POST2*×*SWITCHER* is insignificant. These results suggest that the negative impact of the regulation on H share firms' audit fees in Table 4 is solely attributed to the switchers in the post-switch years.

Table 9 shows the regression results of *OPINION* for the switchers and non-switchers. For both regression models in Table 9, the control firms are always the Red Chip firms. We find that the coefficient on *POST1*×*NON_SWITCHER* is significantly negative. On the other hand, the coefficients on *POST2*×*SWITCHER* and *POST3*×*SWITCHER* are both significantly negative. These results suggest that the negative impact of the regulation on H share firms'

audit opinions in Table 5 is attributed to both the switchers and non-switchers. The negative coefficient on *POST1*×*NON_SWITCHER* is particularly interesting because these firms did not switch to mainland Chinese auditors and yet their H share clients' audit quality declined after the regulation, consistent with the hypothesis that the entry of the mainland Chinese auditors to the Hong Kong H share audit market creates a competitive pressure on the incumbent Hong Kong auditors, leading to a race to the bottom in audit quality.

The contrasting results in Tables 8 and 9 for the non-switchers also indicate that the competitive pressure on the incumbent Hong Kong audit firms resulting from the entry of the 12 mainland Chinese audit firms is run through audit quality rather than audit fees. These findings may not be surprising because audit fees are highly visible to capital market investors while audit quality is a credence good whose quality cannot be discerned easily in the short run (Causholli and Knechel 2012). Therefore, by lowering audit quality, the incumbent Hong Kong audit firms can cave in to the competitive pressure while avoiding the public's scrutiny.

5. Conclusion

The objective of the study is to compare the costs and benefits of two contrasting approaches to regulating the audit market of cross-listed firms. Approach one allows only the auditors domiciled in the host country to audit the books of cross-listed firms while approach two allows either the host country auditors or any eligible third-country auditors (typically home country auditors) approved by the host country regulators to audit the books of cross-listed firms. We test our research question by taking advantage of an exogenous Hong Kong regulation change in 2010 that allows mainland Chinese auditors to audit the books of H share companies (mainland Chinese investors-controlled firms that are incorporated in mainland China but listed in Hong Kong). Prior to the regulation change, only Hong Kong domiciled auditors were allowed to audit the books of the H share companies. We address two specific

questions. First, we examine how the Hong Kong auditors' market share of the H share companies changes after the regulation change. Second, we examine the impact of the regulation change on the H share companies' audit fees and audit quality.

With regard to the first question, we find that the majority of the H share companies continues to employ Hong Kong auditors after the regulation change. As of the end of 2015, the end of our sample, 43 out of the 144 H share companies switched to mainland Chinese auditors. We find that the H share companies that expected greater audit fee saving and lower external financing need are more likely to make the switch. However, we find no evidence that the H share companies with greater managerial agency problems are more likely to switch to mainland auditors.

With regard to our second question, we find that the H share companies as a whole experience a significant decline in both audit fees and audit quality (proxied by the frequency of modified audit opinions) after the regulation change. In addition, we find that the H share companies' audit fee decline is driven by the switchers. On the other hand, the H share companies' audit quality decline is attributed to both the switchers and non-switchers.

Overall, our results illustrate the costs and benefits of the two contrasting regulatory approaches to regulating the audit of cross-listed firms in financial markets with strong investor protection. While approach one may require the H share companies to pay more in audit fees, this approach also delivers higher quality audit due to the host country's stronger institutional environment quality. In addition, our results suggest that allowing home country auditors to compete with host country auditors for the audit of cross-listed firms may also create an unintended consequence: even though many cross-listed firms continue to employ host country auditors, these firms' audit quality also suffers due to the competition from the home country auditors, resulting in a race to the bottom. Our results provide useful information to the ongoing debate on the regulation of cross-listed firms' auditors.

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Appendix A. Construction of expected audit fee saving proxies

Construction of *FEESAVING*:

FEESAVING is defined as the difference between the expected inflation-adjusted audit fees if an H share company employs Hong Kong auditors ($AF_{it}|NON\text{-}SWITCH$) and the expected inflation-adjusted audit fees if it switches to mainland Chinese auditors ($AF_{it}|SWITCH$), scaled by the inflation-adjusted audit fees of the previous year ($AF_{i,t-1}$):

$$FEESAVING_{it} = (AF_{it}|NON\text{-}SWITCH - AF_{it}|SWITCH) / AF_{i,t-1} \quad \text{(A1)}$$

For each firm year, we estimate $AF_{it}|NON\text{-}SWITCH$ and $AF_{it}|SWITCH$ using the following two-step method, similar to the method used by Lennox (2000). First, we estimate the following audit fees model for all H share companies in the sample period 2006-2015:

$$\begin{aligned} AF_{it} = {} & \alpha_0 + \beta_1 SIZE_{it} + \beta_2 LEV_{it} + \beta_3 LOSS_{it} + \beta_4 ROE_{it} + \beta_5 NSUB_{it} + \beta_6 CURRENT_{it} + \beta_7 ARINV_{it} + \\ & \beta_8 BIG4_{it} + \beta_9 AH_{it} + \beta_{10} SOE_{it} + \beta_{11} SWITCH_{it} + \beta_{12} SIZE_{it} \times SWITCH_{it} + \\ & \beta_{13} LEV_{it} \times SWITCH_{it} + \beta_{14} LOSS_{it} \times SWITCH_{it} + \beta_{15} ROE_{it} \times SWITCH_{it} + \\ & \beta_{16} NSUB_{it} \times SWITCH_{it} + \beta_{17} CURRENT_{it} \times SWITCH_{it} + \beta_{18} ARINV_{it} \times SWITCH_{it} + \\ & \beta_{19} BIG4_{it} \times SWITCH_{it} + \beta_{20} AH_{it} \times SWITCH_{it} + \beta_{21} SOE_{it} \times SWITCH_{it} + INDUSTRY_i \end{aligned} \quad \text{(A2)}$$

AF is the natural log of the inflation-adjusted audit fees. $SWITCH_{it}$ equals one if an H share firm *i* employs a mainland Chinese audit firm for Hong Kong annual reporting for year *t*, and zero otherwise. Following Ke et al. (2015) and Ireland and Lennox (2002), we include several control variables, including company size (*SIZE*), financial health (*LEV, LOSS, ROE*), audit complexity (*NSUB*, *CURRENT* and *ARINV*), indicator of whether the auditor is a Big Four audit firm (*BIG4*), an indicator for AH company (*AH*), and an indicator for SOEs (*SOE*). As HKFRS are fully converged with IFRS starting with annual reporting periods commencing from January 1, 2005, we start the sample from the fiscal year 2006 to avoid the transition year 2005. Our sample ends in 2015, the end of our sample period.

Second, we use the coefficients estimated in the first step to compute $AF_{it}|NON\text{-}SWITCH$ and $AF_{it}|SWITCH$ for each firm year. Specifically, $AF_{it}|NON\text{-}SWITCH$ is estimated by setting *SWITCH* to zero and $AF_{it}|SWITCH$ is estimated by setting *SWITCH* to one.

Construction of *FEESAVING2*:

We can observe the realised value of $AF_{it}|SWITCH$ after an H share company switches to mainland Chinese auditors, and the realised value of $AF_{it}|NON\text{-}SWITCH$ if an H share company still hires Hong Kong auditors. Hence, for these two situations, instead of using the estimated values for $AF_{it}|NON\text{-}SWITCH$ and $AF_{it}|SWITCH$, we use the realised value of $AF_{it}|SWITCH$ or $AF_{it}|NON\text{-}SWITCH$ to define *FEESAVING2* as follows:

$$FEESAVING2_{it} = (AF_{it}|NON\text{-}SWITCH - AF_{it}) / AF_{i,t-1}, \text{ if } SWITCH_{it}=1 \quad \text{(A3)}$$

$$FEESAVING2_{it} = (AF_{it} - AF_{it}|SWITCH) / AF_{i,t-1}, \text{ if } SWITCH_{it}=0 \quad \text{(A4)}$$

Construction of *AH*:

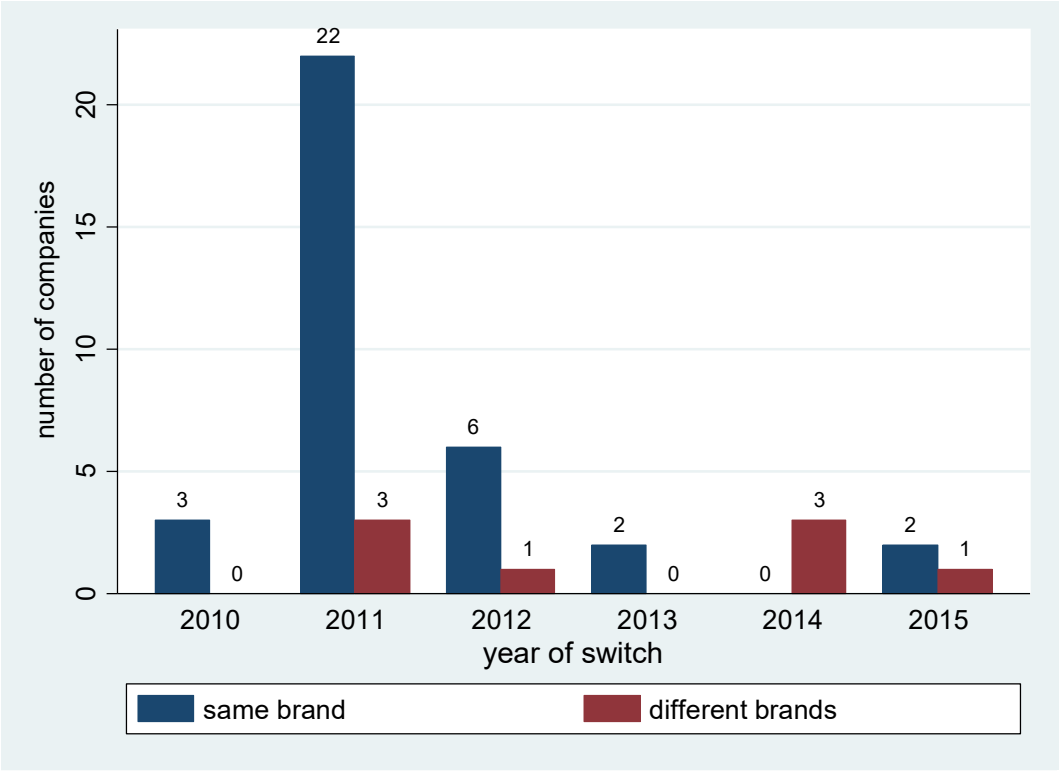
Finally, we use *AH* as an alternative proxy for the audit fee saving. Compared with companies only listed in Hong Kong, before switch, AH companies paid audit fees to both Hong Kong auditors for Hong Kong reporting and mainland Chinese auditors for mainland reporting. Hence, we expect AH firms to save more audit fees by switching to mainland Chinese auditors after the regulation. We define *AH* equal to one if the company is an AH company at the fiscal year end, and zero otherwise.

Appendix B. Variable definitions

Variable name	Definitions
WEDGE	Equals one if the control rights minus the cash flows rights of the ultimate controlling shareholder is positive, and the voting rights of the ultimate shareholder is greater than 10%.
FEESAVING	Difference between the expected inflation-adjusted audit fees if an H share company employs Hong Kong auditors and the expected inflation-adjusted audit fees if it switches to mainland Chinese auditors, scaled by the inflation-adjusted audit fees in the previous year. See Appendix A for the details.
FEESAVING2	For companies that have switched to mainland Chinese auditors, it is the difference between the expected inflation-adjusted audit fees had the companies still employed Hong Kong auditors and the inflation-adjusted actual audit fees in the year, scaled by the inflation-adjusted audit fees of the previous year. For companies that still employ Hong Kong auditors, it is the difference between the inflation-adjusted actual audit fees of the year and the expected inflation-adjusted audit fees had the companies switched to mainland Chinese auditors, scaled by the inflation-adjusted audit fees of the previous year. See Appendix A for the details.
AH	Equals one if the company is an AH firm at the fiscal year end, and zero otherwise.
INVEST_OPP	Measuring investment opportunities. Equals 2-year geometric average of the annual percentage growth in net sales.
EXTERNAL_FIN	Measuring the need for external financing. It equals the difference between the firm's actual growth rate and the sustainable growth rate with retained earnings and short-term and long-term debt financing that maintain a constant debt-to-assets ratio. The actual growth rate is the 2-year geometric average of the annual growth rate in total assets. The sustainable growth rate is the 2-year average of ROE/(1-ROE).
SIZE	The natural logarithm total assets at the end of the year.
LEV	Total liabilities divided by total assets at the end of the year.
LOSS	Equals one if the company reports a loss at the annual report, and zero otherwise.
ROE	Net operating income divided by total equity.
NSUB	Square root of the number of subsidiaries included in the consolidated financial statements.
CURRENT	Current assets divided by current liabilities.
ARINV	Accounts receivable and inventory, divided by total assets.
BIG4	Equals one if the company's Hong Kong annual reporting is audited by a Big Four auditor, and zero otherwise.
SOE	Equals one if the company is a state-owned company, and zero otherwise.
AuditFees (HKD million)	Audit fees in HKD million. For companies only listed in Hong Kong, audit fees include fees paid for the Hong Kong audit. For AH firms, audit fees include fees paid for both mainland and Hong Kong audit.
AF	The natural log of the inflation-adjusted audit fees.
⊿AF	Percentage change of inflation-adjusted audit fees from last year to the current year.
⊿SIZE	Percentage change of *SIZE* from last year to the current year.
⊿LEV	Percentage change of *LEV* from last year to the current year.
⊿CURRENT	Percentage change of *CURRENT* from last year to the current year.
⊿NSUB	Percentage change of *NSUB* from last year to the current year.

Variable name	Definitions
⊿ARINV	Percentage change of *ARINV* from last year to the current year.
HSHARE	Equals one for H share companies, and zero otherwise
POST1	Equals one for fiscal years ending on or after December 31, 2010, and zero otherwise.
OPINION	Equals one if the audit opinion for the Hong Kong reporting is non-clean, and zero if it is clean.
CASH	Cash, cash equivalents, and investment securities, divided by total assets.
RETURN	Annual market-adjusted abnormal return.
AGE	Natural log of the number of years a company has been listed in Hong Kong Stock Exchange.
PSEUDO_POST1	Equals one for the two years immediately before the regulation and zero for all the other years in the pre-period.
PRE_AH	Equals one for H share companies that also had listed A shares prior to the regulation (*PRE_AH*) and zero otherwise.
PRE_H	Equals one for H share companies that had no listed A shares prior to the regulation (*PRE_H*) and zero otherwise.
POST2	A dummy variable that equals one for a firm-year that satisfies both conditions below: (1) ending on or after December 31, 2010, and (2) the company's financial report for Hong Kong investors is still audited by Hong Kong auditors.
POST3	A dummy variable that equals one for a firm-year that satisfies both conditions below: (1) ending on or after December 31, 2010, and (2) the company's financial report for Hong Kong investors is audited by mainland auditors.
NON_SWITCHER	Equals one for H share companies that still employ Hong Kong auditors as of the 2015 annual report, and zero otherwise.
SWITHCER	Equals one for H share companies that have switched to mainland Chinese auditors as of the 2015 annual report, and zero otherwise.

Figure 1. Distribution of the timing of the H share firms' switching to mainland auditors



Notes:

Same brand: the mainland audit firm hired after the switch and the Hong Kong audit firm hired before the switch are under the same brand.

Different brands: the mainland audit firm hired after the switch and the Hong Kong audit firm hired before the switch are under different brands.

Table 1. Market share of Big Four and non-Big Four auditors for H share companies

Panel A. Market share for fiscal year 2009

	Market share by client size	Market share by number of clients
Big Four – HK office	92%	66%
Non Big Four – HK office	8%	34%
Total	100%	100%

Panel B. Market share for fiscal year 2015

	Market share by client size			Market share by number of clients		
	HK office (a)	Mainland office(b)	Total (c=a+b)	HK office (d)	Mainland office (e)	Total (f=d+e)
Big Four	76%	13%	**89%**	44%	13%	**57%**
Non Big Four	8%	4%	**12%**	24%	18%	**42%**
Total	84%	17%	**100%**	68%	31%	**100%**

The table shows market shares between Big Four and non-Big Four auditors for H share companies that have at least one observation for the fiscal years before the regulation and one observation for the fiscal years after the regulation, excluding financial firms. Client size is measured using total assets in 2009 and 2015, respectively. In Panel B, the "Total" of Column (c) and Column (f) are not exactly equal to the sum of columns (a) and (b) and columns (d) and (e), respectively, due to rounding errors.

Table 2. Cox hazard regression results on the determinants of H share firms' auditor choice following the regulation

Panel A: Sample selection

	Switchers	Non-switchers
No. of firm-year observations		
Initial Sample [a]	258	580
Exclude		
Firms years after switch for switchers	(143)	0
Firms listed in Hong Kong in 2009, thus missing data for *INVEST_OPP* and *EXTERNAL_FIN* as of December 31, 2010	(2)	(2)
Firm years with missing data for *NSUB*	0	(13)
Firm years that do not disclose audit fee in the previous year, thus missing data for *FEESAVING* and *FEESAVING2*	(11)	(37)
Firm years that do not disclose audit fee in the current year, thus missing data for *FEESAVING2*	(2)	(6)
Firm years with *NSUB* as 0 in the previous year, thus no valid data for *ΔNSUB*	(1)	(3)
Final Sample	99	519

	Switchers	Non-switchers
No. of unique companies		
Initial Sample	43	101
Final Sample	40	94

[a]: The initial sample includes all H share companies that were listed in Hong Kong before the end of 2009 and have at least one annual report for fiscal year ending on or after December 15, 2010. Firms in financial industry are excluded.

Panel B: Summary Statistics

Variable	N	Mean	Median	Std. Dev	Min.	25%	75%	Max.
Non-switchers								
WEDGE	519	0.268	0.000	0.443	0.000	0.000	1.000	1.000
FEESAVING	519	0.325	0.300	0.289	-0.357	0.142	0.475	1.349
FEESAVING2	519	0.224	0.253	0.413	-1.136	-0.005	0.530	1.612
AH	519	0.366	0.000	0.482	0.000	0.000	1.000	1.000
INVEST_OPP	519	0.156	0.127	0.276	-0.468	0.012	0.255	1.363
EXTERNAL_FIN	519	0.037	0.019	0.193	-0.562	-0.069	0.117	0.757
SIZE	519	23.412	23.815	2.576	17.404	21.414	25.523	28.241
ROE	519	0.052	0.095	0.299	-2.072	0.040	0.151	0.397
LEV	519	0.565	0.530	0.478	0.115	0.329	0.692	3.795
CURRENT	519	1.640	1.296	1.204	0.190	0.835	1.984	5.943
NSUB	519	4.093	3.606	2.459	0.000	2.449	5.568	11.916
ARINV	519	0.221	0.194	0.164	0.000	0.084	0.328	0.663
SOE	519	0.734	1.000	0.442	0.000	0.000	1.000	1.000
$BIG4_{t-1}$	519	0.669	1.000	0.471	0.000	0.000	1.000	1.000
ΔSIZE	519	0.004	0.004	0.008	-0.022	0.001	0.008	0.033
ΔROE	519	-0.128	-0.081	2.136	-10.318	-0.444	0.168	9.577
ΔLEV	519	0.020	0.008	0.175	-0.468	-0.047	0.068	0.775
ΔCURRENT	519	0.046	0.000	0.335	-0.602	-0.104	0.115	1.797
ΔNSUB	519	0.037	0.000	0.151	-0.390	0.000	0.061	0.789
ΔARINV	519	0.108	0.021	0.604	-0.637	-0.083	0.149	4.859
Switchers								
WEDGE	99	0.374	0.000	0.486	0.000	0.000	1.000	1.000
FEESAVING	99	0.393	0.315	0.321	-0.085	0.159	0.521	1.349
FEESAVING2	99	0.194	0.151	0.566	-1.136	-0.155	0.482	1.612
AH	99	0.515	1.000	0.502	0.000	0.000	1.000	1.000
INVEST_OPP	99	0.165	0.140	0.203	-0.202	0.036	0.243	0.689
EXTERNAL_FIN	99	0.068	0.046	0.157	-0.206	-0.016	0.100	0.615
SIZE	99	22.721	22.594	1.922	18.663	21.304	24.167	26.747
ROE	99	0.071	0.079	0.127	-0.443	0.019	0.138	0.393
LEV	99	0.490	0.502	0.194	0.115	0.337	0.625	0.894
CURRENT	99	1.743	1.356	1.136	0.379	1.084	2.145	5.943
NSUB	99	3.929	3.464	1.812	1.732	2.646	4.899	11.916
ARINV	99	0.307	0.304	0.153	0.011	0.196	0.419	0.663
SOE	99	0.788	1.000	0.411	0.000	1.000	1.000	1.000
$BIG4_{t-1}$	99	0.515	1.000	0.502	0.000	0.000	1.000	1.000
ΔSIZE	99	0.006	0.005	0.008	-0.017	0.001	0.011	0.032
ΔROE	99	0.043	-0.013	2.571	-10.318	-0.465	0.403	9.577
ΔLEV	99	0.056	0.020	0.194	-0.326	-0.034	0.117	0.775
ΔCURRENT	99	0.012	-0.020	0.343	-0.602	-0.124	0.101	1.797
ΔNSUB	99	0.051	0.000	0.152	-0.293	0.000	0.074	0.789
ΔARINV	99	0.164	0.054	0.583	-0.464	-0.052	0.171	4.859

Panel C: Regression results

	Dependent variable=hazard rate of auditor switch		
	(1)	(2)	(3)
$FEESAVING_{i,t}$	2.589***		
	(0.002)		
$FEESAVING2_{i,t}$		1.676***	
		(0.001)	
$AH_{i,t}$			1.737***
			(0.001)
$WEDGE_{i,t}$	-0.004	-0.242	-0.128
	(0.994)	(0.626)	(0.787)
$INVEST\_OPP_{i,t}$	-2.669***	-2.433***	-2.161***
	(0.002)	(0.001)	(0.009)
$EXTERNAL\_FIN_{i,t}$	-0.160	-0.180	-0.220
	(0.915)	(0.913)	(0.867)
$BIG4_{i,t-1}$	0.617	0.019	-0.516
	(0.304)	(0.972)	(0.245)
$SIZE_{i,t}$	-0.605**	-0.423**	-0.312**
	(0.017)	(0.032)	(0.045)
$ROE_{i,t}$	0.817	0.538	0.949
	(0.391)	(0.631)	(0.244)
$LEV_{i,t}$	-2.931*	-4.616***	-1.855*
	(0.053)	(0.005)	(0.100)
$CURRENT_{i,t}$	-0.402	-0.651**	-0.132
	(0.111)	(0.047)	(0.593)
$NSUB_{i,t}$	0.229*	0.259**	0.156*
	(0.063)	(0.015)	(0.089)
$ARINV_{i,t}$	4.832***	4.081***	5.110***
	(0.001)	(0.005)	(0.001)
$SOE_{i,t}$	1.275*	1.094	0.656
	(0.070)	(0.150)	(0.345)
$\Delta SIZE_{i,t}$	6.803	13.938	13.739
	(0.832)	(0.675)	(0.718)
$\Delta ROE_{i,t}$	0.057	0.100	0.099*
	(0.263)	(0.108)	(0.057)
$\Delta LEV_{i,t}$	1.238	1.877	2.056
	(0.252)	(0.103)	(0.179)
$\Delta CURRENT_{i,t}$	1.555***	1.855***	1.223***
	(0.000)	(0.000)	(0.004)
$\Delta NSUB_{i,t}$	1.225	0.796	1.617**
	(0.173)	(0.337)	(0.027)
$\Delta ARINV_{i,t}$	0.121	0.007	-0.017
	(0.628)	(0.982)	(0.950)
INDUSTRY	yes	yes	yes
N	618	618	618
Pseudo R^2	0.164	0.180	0.161
Log lik.	-150.579	-147.691	-151.079
Chi-squared	16370.310	19666.698	165.342

All continuous variables are winsorized at the top and bottom 1% percentiles. See Appendix B for variable definitions. *, **, and *** denote significance at 10%, 5%, and 1% levels (two-tailed), respectively. The *p* values reported in parentheses are based on standard errors clustered by company.

Table 3. Sample selection for difference-in-difference tests

Panel A. Sample selection

	Number of firm-year observations	
	Tests of audit fees	Test of audit opinions
All H share companies and Red Chip companies with financial year end from Dec-31-2006 to Dec-31-2015, firms in financial industry excluded	5,837	5,837
Exclude		
Companies with no annual report for all periods before regulation or all periods after the regulation	(1,417)	(1,417)
Firm year not equal to 12 months	(31)	(31)
No disclosure of audit fees	(213)	
No disclosure of number of subsidiaries	(31)	
Missing *RETURN* due to first year listing		(128)
Final Sample	4,145	4,261

Panel B. Distribution of sample firms for audit fees

	Number of firms	
H share		
Non-switchers	95	
Switchers	43	138
Red Chip		352
Total		490

Panel C. Distribution of sample firms for audit opinions

	Number of firms	
H share		
Non-switchers	101	
Switchers	43	144
Red Chip		354
Total		498

See Appendix B for variable definitions.

Table 4. Impact of the regulation on audit fees for all H share companies

Panel A. Descriptive statistics for H share and Red Chips before and after the reform

	Before the reform				After the reform			
	N	Mean	Median	S.D	N	Mean	Median	S.D
H share								
AuditFees (HKD million)	485	7.593	3.060	12.879	777	8.554	3.590	12.979
AF	485	14.954	14.897	1.255	777	15.121	15.057	1.269
SIZE	485	22.656	22.756	2.092	777	23.326	23.532	2.348
LEV	485	0.479	0.475	0.247	777	0.536	0.524	0.307
LOSS	485	0.186	0.000	0.389	777	0.193	0.000	0.395
ROE	485	0.072	0.102	0.301	777	0.053	0.087	0.285
NSUB	485	3.434	3.162	1.953	777	4.175	3.606	2.352
CURRENT	485	1.873	1.311	2.018	777	1.646	1.295	1.215
ARINV	485	0.213	0.186	0.150	777	0.248	0.225	0.169
BIG4	485	0.732	1.000	0.443	777	0.613	1.000	0.487
AH	485	0.344	0.000	0.476	777	0.441	0.000	0.497
SOE	485	0.757	1.000	0.430	777	0.737	1.000	0.440
Red Chip								
AuditFees (HKD million)	1,025	3.362	1.720	6.804	1,858	4.126	2.220	7.285
AF	1,025	14.398	14.330	0.972	1,858	14.663	14.589	0.945
SIZE	1,025	21.577	21.504	1.785	1,858	22.384	22.332	1.835
LEV	1,025	0.462	0.407	0.380	1,858	0.486	0.464	0.311
LOSS	1,025	0.287	0.000	0.453	1,858	0.346	0.000	0.476
ROE	1,025	0.051	0.093	0.347	1,858	0.003	0.063	0.377
NSUB	1,025	4.057	3.606	1.836	1,858	4.459	4.000	1.969
CURRENT	1,025	3.122	1.795	3.974	1,858	2.643	1.571	3.443
ARINV	1,025	0.218	0.188	0.184	1,858	0.231	0.175	0.198
BIG4	1,025	0.686	1.000	0.464	1,858	0.681	1.000	0.466
AH	1,025	0.000	0.000	0.000	1,858	0.000	0.000	0.000
SOE	1,025	0.318	0.000	0.466	1,858	0.329	0.000	0.470

Panel B. Regression results

	Dependent variable=$AF_{i,t}$	
	Coefficients	p-value
$POST1_t \times HSHARE_i$	-0.059*	(0.056)
$SIZE_{i,t}$	0.227***	(0.000)
$LEV_{i,t}$	0.127***	(0.004)
$LOSS_{i,t}$	0.034**	(0.023)
$ROE_{i,t}$	-0.043**	(0.023)
$CURRENT_{i,t}$	-0.012***	(0.000)
$NSUB_{i,t}$	0.032***	(0.002)
$ARINV_{i,t}$	-0.115	(0.154)
$BIG4_{i,t}$	0.407***	(0.000)
$AH_{i,t}$	-0.086	(0.420)
$SOE_{i,t}$	0.064	(0.215)
Constant	9.050***	(0.000)
Year fixed effects	yes	
Firm fixed effects	yes	
N	4,145	
Adj. R^2	0.951	

All continuous variables are winsorized at the top and bottom 1% level. See Appendix B for variable definitions. *, **, and *** denote significance at 10%, 5%, and 1% levels (two-tailed), respectively. The *p* values reported in parentheses are based on standard errors clustered by company.

Table 5. Impact of the regulation on audit opinions for all H share companies

Panel A. Descriptive statistics

	Before the regulation				After the regulation			
	N	Mean	Median	S.D	N	Mean	Median	S.D
H share								
OPINION	515	0.105	0.000	0.307	838	0.057	0.000	0.233
LOSS	515	0.219	0.000	0.414	838	0.197	0.000	0.398
ROE	515	0.073	0.102	0.329	838	0.052	0.085	0.283
CURRENT	515	1.751	1.310	1.706	838	1.644	1.304	1.202
CASH	515	0.177	0.143	0.145	838	0.169	0.137	0.129
ARINV	515	0.219	0.198	0.149	838	0.252	0.229	0.167
SIZE	515	22.509	22.616	2.140	838	23.298	23.504	2.327
LEV	515	0.497	0.480	0.263	838	0.541	0.527	0.326
SOE	515	0.717	1.000	0.451	838	0.732	1.000	0.443
RETURN	515	0.402	0.060	0.940	838	0.105	-0.002	0.508
BIG4	515	0.682	1.000	0.466	838	0.615	1.000	0.487
AGE	515	1.846	1.792	0.597	838	2.370	2.398	0.442
AH	515	0.334	0.000	0.472	838	0.420	0.000	0.494
Red Chip								
OPINION	1,001	0.123	0.000	0.328	1,907	0.133	0.000	0.339
LOSS	1,001	0.316	0.000	0.465	1,907	0.345	0.000	0.475
ROE	1,001	0.048	0.083	0.397	1,907	0.008	0.063	0.384
CURRENT	1,001	3.037	1.745	3.942	1,907	2.647	1.581	3.436
CASH	1,001	0.221	0.167	0.178	1,907	0.192	0.138	0.166
ARINV	1,001	0.218	0.185	0.189	1,907	0.233	0.178	0.198
SIZE	1,001	21.493	21.418	1.830	1,907	22.371	22.333	1.843
LEV	1,001	0.494	0.415	0.446	1,907	0.493	0.467	0.343
SOE	1,001	0.331	0.000	0.471	1,907	0.324	0.000	0.468
RETURN	1,001	0.506	0.020	1.235	1,907	0.069	-0.078	0.636
BIG4	1,001	0.657	1.000	0.475	1,907	0.678	1.000	0.468
AGE	1,001	2.110	2.197	0.789	1,907	2.442	2.485	0.642
AH	1,001	0.000	0.000	0.000	1,907	0.000	0.000	0.000

Panel B. Regression results

	Dependent variable= $OPINION_{i,t}$			
	(1) OLS		(2) Conditional logit	
	Coefficients	p-value	Coefficients	p-value
$POST1_t \times HSHARE_i$	-0.053**	(0.026)	-1.571***	(0.004)
$LOSS_{i,t}$	0.066***	(0.000)	1.037***	(0.000)
$ROE_{i,t}$	-0.055**	(0.029)	-0.418**	(0.039)
$CURRENT_{i,t}$	-0.004	(0.305)	-0.101*	(0.058)
$CASH_{i,t}$	-0.150*	(0.061)	-3.792***	(0.004)
$ARINV_{i,t}$	-0.305***	(0.000)	-4.555***	(0.000)
$SIZE_{i,t}$	-0.028*	(0.066)	-0.397*	(0.067)
$LEV_{i,t}$	0.265***	(0.000)	2.434***	(0.000)
$SOE_{i,t}$	0.039	(0.423)	0.155	(0.765)
$RETURN_{i,t}$	-0.006	(0.268)	-0.112	(0.334)
$BIG4_{i,t}$	-0.052	(0.182)	-0.634	(0.203)
$AGE_{i,t}$	0.033	(0.218)	1.389	(0.107)
$AH_{i,t}$	0.005	(0.812)		
Constant	0.654*	(0.052)		
Year fixed effects	yes		yes	
Firm fixed effects	yes		yes	
N	4,261		1,088	
Adj R^2	0.550			
Pseudo R^2			0.341	

All continuous variables are winsorized at the top and bottom 1% percentiles. See Appendix B for variable definitions. The sample size of the conditional logit is smaller than that of the OLS due to the perfect prediction of the conditional logit regression. *, **, and *** denote significance at 10%, 5%, and 1% levels (two-tailed), respectively. The *p* values reported in parentheses are based on standard errors clustered by company. *AH* is omitted in conditional logit regression because of no within-group variation.

Table 6. Test of the parallel trends assumption

	(1) Dependent variable=$AF_{i,t}$		(2) Dependent variable=$OPINION_{i,t}$	
	Coefficients	p-value	Coefficients	p-value
$PSEUDO\_POST1_t \times HSHARE_i$	0.031	(0.393)	-0.030	(0.287)
N	1,510		1,534	
Adj. R^2	0.959		0.646	

OLS regressions are used. We are not able to run the conditional logit model for audit opinion because the sample size is too small and therefore the conditional logit regression fails to converge. All continuous variables are winsorized at the top and bottom 1% percentiles. See Appendix B for variable definitions. *, **, and *** denote significance at 10%, 5%, and 1% levels (two-tailed), respectively. The control variables, year and firm fixed effects are included in estimation but not reported. The *p* values reported in parentheses are based on standard errors clustered by company.

Table 7. Regression result of audit opinions for AH firms and H firms

	Dependent variable= $OPINION_{i,t}$			
	OLS		Conditional logit	
	Coefficients	p-value	Coefficients	p-value
$POST1_t \times PRE\_AH_i$	-0.061**	(0.037)	-16.391***	(0.000)
$POST1_t \times PRE\_H_i$	-0.048*	(0.099)	-1.244**	(0.023)
$LOSS_{i,t}$	0.066***	(0.000)	1.072***	(0.000)
$ROE_{i,t}$	-0.055**	(0.029)	-0.348*	(0.086)
$CURRENT_{i,t}$	-0.004	(0.305)	-0.101*	(0.056)
$CASH_{i,t}$	-0.150*	(0.061)	-3.791***	(0.003)
$ARINV_{i,t}$	-0.305***	(0.000)	-4.471***	(0.000)
$SIZE_{i,t}$	-0.028*	(0.068)	-0.421*	(0.051)
$LEV_{i,t}$	0.265***	(0.000)	2.401***	(0.001)
$SOE_{i,t}$	0.040	(0.418)	0.155	(0.763)
$RETURN_{i,t}$	-0.006	(0.266)	-0.113	(0.333)
$BIG4_{i,t}$	-0.052	(0.179)	-0.635	(0.200)
$AGE_{i,t}$	0.031	(0.247)	1.082	(0.198)
$AH_{i,t}$	0.005	(0.795)		
Constant	0.656*	(0.051)		
Year fixed effects	yes		yes	
Firm fixed effects	yes		yes	
Coefficient comparisons	F-statistic		Chi^2	
POST1×PRE_AH vs. *POST1×PRE_H*	0.131	(0.718)	205.277	(0.000)
N	4,261		1,088	
Adj R^2	0.550			
Pseudo R^2			0.341	

All continuous variables are winsorized at the top and bottom 1% percentiles. See Appendix B for variable definitions. The sample size of the conditional logit is smaller than that of the OLS due to the perfect prediction of the conditional logit regression. *, **, and *** denote significance at 10%, 5%, and 1% levels (two-tailed), respectively. The p values reported in parentheses are based on standard errors clustered by company. *AH* is omitted in conditional logit regression because of no within-group variation.

Table 8. The impact of the regulation on audit fees for the switchers and non-switchers

	Dependent variable=$AF_{i,t}$			
	(1)		(2)	
	Coefficients	p-value	Coefficients	p-value
$POST1_t \times NON\_SWITCHER_i$	-0.027	(0.453)		
$POST2_{i,t} \times SWITCHER_i$			-0.020	(0.564)
$POST3_{i,t} \times SWITCHER_i$			-0.189***	(0.000)
$SIZE_{i,t}$	0.226***	(0.000)	0.222***	(0.000)
$LEV_{i,t}$	0.126***	(0.005)	0.130***	(0.008)
$LOSS_{i,t}$	0.034**	(0.027)	0.032**	(0.044)
$ROE_{i,t}$	-0.036*	(0.051)	-0.056**	(0.012)
$CURRENT_{i,t}$	-0.013***	(0.000)	-0.013***	(0.000)
$NSUB_{i,t}$	0.036***	(0.001)	0.034***	(0.003)
$ARINV_{i,t}$	-0.112	(0.178)	-0.130	(0.137)
$BIG4_{i,t}$	0.386***	(0.000)	0.449***	(0.000)
$AH_{i,t}$	-0.141	(0.394)	0.049	(0.730)
$SOE_{i,t}$	0.062	(0.250)	0.077	(0.176)
Constant	9.067***	(0.000)	9.042***	(0.000)
Year fixed effects	yes		yes	
Firm fixed effects	yes		yes	
Coefficient comparisons				p-value
$POST1 \times NON\_SWITCHER$ vs. ($POST2 \times SWITCHER + POST3 \times SWITCHER$)				0.0056
N	3,752		3,276	
Adj. R^2	0.951		0.938	

All continuous variables are winsorized at the top and bottom 1% percentiles. See Appendix B for variable definitions. *, **, and *** denote significance at 10%, 5%, and 1% levels (two-tailed), respectively. The *p* values reported in parentheses are based on standard errors clustered by company.

Table 9. The impact of the regulation on audit opinions for the switchers and non-switchers

	Dependent variable= $OPINION_{i,t}$			
	OLS		Conditional Logit	
	(1)	(2)	(3)	(4)
$POST1_t \times NON\_SWITCHER_i$	-0.048*		-1.486**	
	(0.088)		(0.018)	
$POST2_{i,t} \times SWITCHER_i$		-0.058		-1.868**
		(0.104)		(0.017)
$POST3_{i,t} \times SWITCHER_i$		-0.074**		-2.104*
		(0.019)		(0.086)
$LOSS_{i,t}$	0.061***	0.057***	0.928***	0.815***
	(0.002)	(0.003)	(0.002)	(0.005)
$ROE_{i,t}$	-0.055**	-0.044*	-0.408**	-0.361*
	(0.030)	(0.091)	(0.043)	(0.092)
$CURRENT_{i,t}$	-0.004	-0.003	-0.102*	-0.087*
	(0.293)	(0.356)	(0.052)	(0.069)
$CASH_{i,t}$	-0.148*	-0.148*	-3.728***	-3.504***
	(0.075)	(0.093)	(0.004)	(0.007)
$ARINV_{i,t}$	-0.303***	-0.308***	-4.357***	-4.169***
	(0.000)	(0.000)	(0.000)	(0.000)
$SIZE_{i,t}$	-0.031**	-0.035**	-0.411*	-0.385*
	(0.045)	(0.037)	(0.057)	(0.070)
$LEV_{i,t}$	0.263***	0.260***	2.383***	2.186***
	(0.000)	(0.000)	(0.000)	(0.001)
$SOE_{i,t}$	0.046	0.055	0.221	0.144
	(0.359)	(0.311)	(0.684)	(0.791)
$RETURN_{i,t}$	-0.006	-0.004	-0.108	-0.050
	(0.299)	(0.531)	(0.359)	(0.685)
$BIG4_{i,t}$	-0.061	-0.057	-0.580	-0.658
	(0.174)	(0.186)	(0.236)	(0.212)
$AGE_{i,t}$	0.028	0.031	1.465*	1.230
	(0.332)	(0.300)	(0.099)	(0.198)
$AH_{i,t}$	-0.013	0.033		
	(0.590)	(0.240)		
Constant	0.733**	0.797**		
	(0.034)	(0.026)		
Year fixed effects	yes	yes	yes	yes
Firm fixed effects	yes	yes	yes	yes
Coefficient comparisons	p-value		p-value	
POST1×*NON_SWITCHER* vs. (*POST2*× *SWITCHER*+ *POST3*× *SWITCHER*)	0.1503		0.1921	
N	3,854	3,315	1,024	919
Adj R^2	0.554	0.533		
Pseudo R^2			0.338	0.302

All continuous variables are winsorized at the top and bottom 1% percentiles. See Appendix B for variable definitions. The sample sizes in the last two columns are smaller than those in the first two columns due to the perfect prediction of the conditional logit regression. *, **, and *** denote significance at 10%, 5%, and 1% levels (two-tailed), respectively. The *p* values reported in parentheses are based on standard errors clustered by company. *AH* is omitted in conditional logit regression because of no within-group variation.