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MANDATORY AUDIT FIRM ROTATION AND BIG4 EFFECT ON AUDIT QUALITY: EVIDENCE FROM SOUTH KOREA

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ABSTRACT

In South Korea, due to concurrent financial scandals, Korean legislators implemented two major audit policies in the 2000s; the mandatory audit "partner" rotation policy in 2000 and the mandatory audit "firm" rotation policy in 2006. The mandatory audit "firm" rotation policy was introduced as a mean to improve audit quality based on the auditor entrenchment hypothesis. In this paper, we compare the audit quality of firms subjected to mandatory audit "firm" rotation with two benchmark groups, a sample that adopted the policy voluntarily; the second group consists of the mandatory "firm" rotation sample in years prior, a period firms were subject to mandatory audit "partner" rotation. Using accrual-based measures as proxies for audit quality, we find evidence that audit quality of the mandatory rotation firm sample is lower compared to firms that voluntarily adopted the policy. Furthermore, we find evidence that audit quality of the mandatory rotation firm sample is lower compared to the mandatory audit partner firm sample. Additionally, we also find evidence that the mandatory audit firms rotation sample whose auditors were rotated from Non-Big4 to Big4 are generally associated with lower levels of abnormal accruals consistent with the argument that the audit quality of Big4 accounting firms is superior to Non-Big4 firms. Finally, longer audit tenure and switches to Big4 audit firms generally have a positive effect upon audit quality. These findings suggest that extended audit tenure improves audit quality due to accounting firm's

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accumulated client specific knowledge. Thus, our evidence suggests that the mandatory audit firm rotation policy did not have the desired effect in a Korean context.

Keywords: mandatory audit firm rotation, mandatory audit partner rotation, abnormal accruals, audit quality

INTRODUCTION

Public concern over instances of accounting fraud has increased due to major accounting scandals. A review of auditor behaviour from recent U.S. accounting scandals suggests auditors did not possess sufficient skepticism, objectivity or independence; hence, audit quality deteriorates with longer audit tenure (DeFond & Francis, 2005). Mandatory audit firm rotation has been considered as a policy with the potential to improve audit quality for decades. However, in the early 2000s, the Enron and the WorldCom financial scandals reignited the debate. Opponents of the mandatory audit firm rotation policy argue that auditing errors are more likely to occur in the initial years of the auditor-client relationship due to the loss of auditors' cumulative knowledge. On the other hand, proponents of the mandatory audit firm rotation policy argue that prolonged audit tenure negatively affects the auditor-client relationship because managers often have an opportunity to manage earnings when audit firms have an incentive to satisfy client's requests to retain an audit contract, which creates a basic conflict.

The Korean setting provides a unique opportunity to conduct empirical analysis on the effectiveness of the mandatory audit "firm" rotation policy on audit quality, a relatively rare policy internationally. Korea adopted the mandatory audit "firm" rotation policy because of concurrent financial scandals since 1997. In 2001, the Financial Supervisory Commission (FSC) mandated a three-year mandatory audit "partner" rotation policy in response to the Kia and Korean Air accounting scandals. In 2002, in the U.S., the Security and Exchange Commission (SEC) considered the mandatory audit "firm" rotation policy while enacting Sarbanes-Oxley Act (SOX), following major U.S. financial scandals to restore public confidence in the profession. However, based on the research conducted by the General Accounting Office, the SEC decided not to adopt the mandatory audit firm rotation policy. In 2003, the Financial Supervisory Service (the Korean regulator, hereafter FSS) proposed the controversial mandatory audit "firm" rotation policy because of the failure of SK global and Daewoo, two of Korea's largest conglomerates within the mandatory audit firm "partner" rotation period. Mandatory audit "firm" rotation was considered to be a more robust policy for reducing financial mismanagement and financial scandal compared

to mandatory audit "partner" rotation by the Korean government, based on the auditor entrenchment hypothesis. The mandatory audit "firm" rotation policy was not adopted in the U.S. on the grounds the social cost would exceed the perceived benefits. The mandatory audit "firm" policy became fully effective in 2006 and was adopted on a firm by firm basis. The mandatory audit "firm" rotation policy mandated that firms replace their audit firm as a service provider, every six years. However, the mandatory audit "firm" rotation policy ended in 2010, lasting for only five years due to the adoption of IFRS and political pressure due to double regulation.

This analysis, to our knowledge, is one of the first empirical studies comparing the effect of mandatory audit "firm" rotation and "partner" rotation on audit quality. Previous mandatory auditor rotation studies suggest that there are significant costs that outweigh the benefits of a "fresh look" by a new audit firm (Johnson, Khurana, & Reynolds, 2002; Myers, Myers, & Omer, 2003; Blouin, Grein, & Rountree, 2007). Chi, Huang, Liao and Xie (2009) examine the effect of mandatory partner rotation on audit quality in Taiwan, employing absolute abnormal accruals as proxies for audit quality, and the earnings response coefficient as a proxy for perceived audit quality. They find no evidence that mandatory audit partner rotation enhances audit quality. Our study differs from Chi et al. (2009) by directly comparing the audit quality of firms that promulgate the mandatory audit "firm" policy after a period of mandatory audit "partner" rotation. Thus, Korea's unique regulatory system enables us to make inferences about which sample has the highest levels of audit quality, mandatory audit "partner" or "firm" rotation.

Kwon, Lim and Simnett (2014) analyse the effect of mandatory audit firm rotation on audit quality and audit fees before and after 2006, the period the audit firm rotation policy was adopted. They find that audit fees increase after 2006, but audit quality remains unaffected. Our study differs from Kwon, due to the fact we incorporate partitioning that allows us to capture audit quality based on managers varying levels of opportunity to manage earnings and audit firms' incentives to accommodate the managers in three-year policy periods, rather than before and after 2006. Our group of interests are firms subject to the mandatory audit firm rotation policy from 2006–2009. We compare this group with two benchmark groups. First, we compare the mandatory rotation sample with firms in the same sample period (2006–2009) which are not subject to the mandatory audit firm rotation policy; second, we compare the mandatory rotation sample with the firm itself in prior periods where the firms are subject to the mandatory partner rotation policy (2000–2008). We believe this partitioning adds robustness due to the fact that all firms did not adopt the mandatory audit firm rotation policy in 2006. In 2006, a manager's opportunity to manage earnings and an audit firm's incentives

to accommodate managers vary dependent on the period of audit policy adoption (see Figure 1).

We conduct empirical tests to analyse the effect of the implementation of the mandatory audit firm rotation policy on audit quality. First, we use two measures of abnormal accruals as proxies for audit quality; the modified Jones model suggested by Dechow, Sloan and Sweeney (1995) and the performance-adjusted Jones model suggested by Kothari, Leone and Wasley (2005). Abnormal accruals are widely used in accounting literature as proxies for earnings and/or audit quality (Healy & Wahlen, 1999; Kothari, 2001; Myers et al., 2003; Chen, Lin, & Lin, 2008; Chi et al., 2009). We find evidence that the audit quality of the mandatory audit firm rotation sample is lower or indifferent, compared to the samples in the same sample period (2006–2009). Moreover, we find evidence that the audit quality of a firm in the mandatory audit firm rotation sample is lower or indifferent compared to earlier years under the mandatory partner rotation policy (2000–2008). Thus, we find evidence supporting the auditor expertise hypothesis that mandatory audit firm rotation does not enhance audit quality. The results are robust to various forms of additional analysis.

Secondly, we examine the relationship between audit quality and four different types of audit 'switch' for the mandatory audit firm rotation sample. Numerous studies find that Big4 auditors provide higher audit quality information compared to non-Big4 auditors (DeAngelo, 1981; Becker, DeFond, Jiambalvo, & Subramanyam, 1998; Khurana & Raman, 2004; Behn, Choi, & Kang, 2008). Consistent with the current literature, we find that levels of abnormal accruals decrease as firms are mandatorily rotated from non-Big4 to Big4 audit firms. Concurrently, we test the association between audit tenure and audit quality. Numerous studies find audit quality increases with audit tenure (Myers et al., 2003; Chi & Huang, 2005; Chi et al., 2009). Our results suggest that longer audit tenure has a positive effect on audit quality, consistent with previous findings.

This study is motivated by the varying policy decisions of the world's largest two economic regions, the U.S. and the European Union. In April 2014, the European Parliament approved a mandatory audit firm rotation policy, requiring European listed companies, banks and financial institutions to appoint a new audit firm every 10 years. However, in the U.S., the mandatory audit firm rotation policy, a policy suggested by the Public Company Accounting Oversight Board (PCAOB) was rejected by the U.S. House of Representatives. Therefore, our findings may be of interest to both groups of legislators. Our study makes several contributions. First, previous studies empirically examine the effect of a mandatory audit firm rotation policy and a mandatory audit partner rotation policy on audit quality in individual

tests. However, we compare the audit quality of a mandatory audit "firm" rotation period with a mandatory audit "partner" rotation. Secondly, the majority of studies compare audit quality before and after legislation is introduced using a "before and after" calendar year approach. However, due to Korea's unique experiment with audit policy, we partition our sample to capture managers' opportunity to manage earnings and auditors' incentives to satisfy clients to retain an audit contract. This partitioning is necessary because audit firms and managers have different incentives based on the period of policy adoption. Thus, our partitioning captures an auditors' incentive to impair independence based on policy adoption period rather than calendar year. Thirdly, we consider the partial effect of audit switch type and audit tenure. Forth, our study extends previous Korean studies in several distinctive manners, including the use of two unique benchmark samples.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Institutional Setting

La Porta, Lopez-De-Silanes, Shleifer and Vishny (1997) find that the Korean economy can be considered comparable to developed countries; however, in the past, Korea's legal enforcement has been considered weak. Recent evidence suggests that South Korea's legislative infrastructure is improving. A report by the FTSE, the London Stock Exchange suggests that in most respects South Korea satisfies the definitions and standards of a developed market (Woods, 2013). Korea's economy has developed rapidly; however, financial scandals have necessitated Korea's experimentation with numerous audit policies. Numerous countries practice the mandatory audit partner rotation policy. The mandatory audit firm rotation policy is a legal requirement for only a small number of countries. For instance, firms in Italy and Brazil are required to rotate their audit firms every nine and five years respectively. The Korean setting is unique because the mandatory audit firm rotation policy, a policy which is rare internationally coexisted with the mandatory partner rotation policy because firms adopted both policies on an individual basis. The mandatory audit "partner" and "firm" rotation policies are significantly different with regards to the auditor-client relationship. The mandatory audit "partner" rotation policy allows a firm to retain the services of an audit firm under the supervision of another partner or affiliate. The mandatory audit "firm" rotation policy requires firms to change their audit company after a specified period. The mandatory audit "firm" and "partner" rotation policies differ in the sense that the relationship between clients and auditors are different after a "partner" and "firm" rotation. Mandatory audit "partner" rotation enables partners within the same audit firm to cooperate, hence audit firms are able maintain firm

specific knowledge. The mandatory "firm" rotation is designed to promote auditor independence; however, increased auditor independence will almost certainly lead to a decrease in firm specific knowledge. Korea is the very first country to adopt the mandatory audit firm rotation policy after the high-profile accounting scandals and the passage of SOX. Thus, it is possible to empirically test the difference in audit quality between the mandatory audit firm rotation sample (2006–2009) and the audit quality of two benchmark groups (2000–2009), the mandatory audit "partner" group, and firms that adopt the policy on a voluntary basis. If accounting quality increases after mandatory audit "firm" rotation, the results would suggest that increased auditor independence has the desired effect, consistent with the auditor entrenchment hypothesis. If abnormal accrual increase or do not change after the adoption of the mandatory audit "firm" policy, the policy can be seen as having a negative effect on audit quality through the loss of firm specific knowledge attainable under the mandatory audit "partner" rotation policy, consistent with the auditor expertise hypothesis.

In 2003, the SSB (Securities Supervisory Board, the predecessor of FSC) of Korea promulgated a policy that required corporate entities to rotate their audit firm every six years on a mandatory basis (effective in 2006). This policy was introduced because of public distrust in the Korean external audit system due to auditing errors. Prior to 1982, Korea adopted an auditor designation "rule", whereby the regulatory body, SSB, assigned external auditors for all listed firms. In 1982, the Korean government introduced the free audit engagement "rule" because of increasingly interdependent capital markets and the international convergence of accounting standards. Thus, the decision of the Korean government to adopt the audit engagement rule in lieu of the mandatory designation system was designed to integrate the Korea's accounting system in-line with international accounting trends. Moreover, moral and ethical issues involving CPAs in the 1970s accelerated the repeal of the designation rule in 1981. The free audit engagement "rule" permitted a firm the right to independently choose an audit firm for the first time. Since firms were able to select their audit firm in 1982, the power of audit engagement negotiation moved from audit firms to client companies which impeded the protection of auditor independence. In 1997, the FSC promulgated two additional rules that require firms to retain auditors for three-years, and audit partner rotation after five years. In 2001, the FSC mandated a three-year mandatory partner rotation policy in response to the 1997 Asian financial crisis and the Kia and Korean Air accounting scandals. In 2003, investigators found that abnormally high levels of window dressing caused the collapse of Daewoo, one of the largest conglomerates in 1999. The incident damaged the reputation of Angin Deloitte, one of the largest audit firms in Korea, the Korean government and the accounting profession.

In 2003, a period the mandatory auditor partner rotation was being practiced, SK Global, another large Korean conglomerate overstated earnings by 1.5 trillion won. In 2003, the FSC announced that, on average, one of three domestic firms was committing accounting fraud, and seven of out ten Korean conglomerates, known as Chaebol, engaged in some kind of earnings manipulation. Thus, following a period of successive financial failures, Korean regulators were required to consider policies to improve audit quality and to increase public confidence in public auditing. In 2003, the FSC promulgated the mandatory audit firm rotation policy. The introduction of the mandatory audit firm rotation policy was influenced by the passage of SOX of 2002 in the U.S. and the establishment of PCAOB. In 2003, in the U.S., the PCAOB considered the adoption of the mandatory audit firm rotation policy, introduced by SOX. But the policy was not adopted in the U.S. on the grounds the social cost would exceed the perceived benefits. However, in Korea, consecutive accounting scandals compel legislators to adopt the mandatory audit firm rotation policy under the assumption of the auditor entrenchment hypothesis. The policy became effective in 2006 and lasted for five years until 2010. The FSC abolished mandatory audit firm rotation in 2010, with the adoption of IFRS (2009/3) and political pressure from the business community due to the additional cost of double regulation.

Our study is motivated by the varying policy decisions of the two world's largest economic regions, the U.S. and the EU. In 2011, in the U.S., the PCAOB proposed the introduction of the mandatory audit firm rotation policy despite opposition from audit firms and corporations. The PCAOB argue that the practice of the 5-year mandatory audit partner rotation policy was not sufficient to protect auditor independence. The PCAOB suggest that the mandatory audit firm rotation policy would increase audit quality through protected auditor independence, enhance objectivity and professional skepticism (PCAOB, 2011a). Later in 2011, the PCAOB issue a concept release explaining that mandatory audit firm rotation policy has the potential to increase investor confidence, audit quality and the quality of financial reporting (PCAOB, 2011b). However, in July 2013, the U.S. House of Representatives introduce legislation that would prevent the PCAOB from implementing the audit firm rotation policy.

Following the PCAOB's announcement in the U.S., the European Commission (EC) announced its intention to adopt the mandatory audit firm rotation policy (Dalton, 2011; Brunsden, 2011). Following the announcement, the European Union's agreement in December 2013 (EU 2013) contained requirements for the mandatory rotation of auditors after 10 years for public interest entities (PIEs). In April 2014, the European Parliament approved the mandatory audit firm rotation policy, requiring European listed companies, banks and financial

institutions to appoint a new audit firm every 10 years. Thus, the two world's largest economic regions have considered implementing a mandatory audit firm rotation policy; however, both regions have made different policy decisions. Therefore, the effectiveness of the mandatory "audit partner" rotation policy and mandatory "audit firm" rotation policy as means to improve audit quality is an important empirical question left unanswered. Our findings may be of interest to regulators in the EU and the U.S. because Korea's experiments with audit policy changes offer unique evidence of how the mandatory audit firm rotation policy effects audit quality.

Literature Review

Whether or not extended audit firm period vitiates auditor independence or enhances audit quality is a recurring debate. Proponents of audit firm rotation, advocates of the audit entrenchment hypothesise argue that mandatory rotation prevents auditors from becoming closely aligned with managers, thus maintaining independence. Deis and Giroux (1992) review audit quality letters produced by a public audit agency and conclude that audit quality declines as tenure increases. Brody and Moscove (1998) suggest that mandatory audit firm rotation reduces the influence of firm's management on auditors and therefore can enhance audit quality. Ryan et al. (2001) report that extended audit tenure provides incentives for audit firms to retain their client's contract, thus audit quality can be negatively affected. Moreover, Casterella, Knechel and Walket (2002) argue that window dressing and audit failures occur more frequently as audit tenure is extended.

On the other hand, opponents of mandatory audit firm rotation, advocates of the audit expertise hypothesise state that a number of studies report that audit failures occur more often in the initial stage of an audit service (Peirre & Anderson, 1984; American Institute of Certified Public Accountants [AICPA], 1992; Arrunada & Paz-Ares, 1997; Johnstone & Bedard, 2004; Carcello & Nagy, 2004, Chen et al., 2008). Johnson et al. (2002) examine the relation between audit firm tenure and absolute abnormal accruals. They find absolute abnormal accruals are larger in short tenure (two to three years), than that of medium (four to eight years) and long tenures (nine or more years), suggesting deterioration in audit quality in the early years of tenure. Geiger and Raghunandan (2002) argue that auditors issue qualified audit opinions on business collapses more often when audit tenure is short. Myers et al. (2003) report that the magnitude of both absolute abnormal accruals and current accruals declines with longer audit tenure, suggesting that audit quality is positively associated with audit tenure.

Recent studies suggest that mandatory partner rotation does not have a positive effect on audit quality. Chi and Huang (2005) examine the effect of audit firm and partner tenure on earnings quality independently in the Taiwanese audit market using signed abnormal accruals as a proxy for earnings quality. They find lower earnings quality in the early years of audit firm and/or partner tenures as well as the later years of audit firm tenure. Carey and Simnett (2006) find a decline in audit quality, as proxied by the propensity to issue going concern opinions and the incidence of just beating earnings benchmarks. Chi et al. (2009) directly examine the effect of mandatory audit partner rotation in Taiwan and found no evidence that the policy enhances audit quality. However, mandatory audit firm rotation entails significantly higher costs to both client firms and auditors alike compared to mandatory audit partner rotation. Lennox, Wu and Zhang (2014) find evidence consistent with mandatory audit partner rotation improving audit quality in Chinese firms. They conjecture that a partner is motivated to clean up financial statements before handing them over to a new partner; moreover, a new partner brings in a fresh perspective.

Thus, the literature is mixed. In the early 1990s, the literature suggests that increased audit tenure has a negative effect on audit quality. However, the literature has not reached a consensus about the benefits of mandatory audit rotation. Kwon et al. (2014) is the first author to study the economic impact of the mandatory rotation policy initiative on audit quality, and the associated implications for audit fees in Korea. Their study takes a pre- and post calendar year approach to compare pre 2006 and post 2006 periods; long vs short term audit tenure and voluntary vs mandated firm rotation samples. Kwon et al. (2014) suggests that audit quality measured as abnormal discretionary accruals do not significantly change compared with pre-2006 long-tenure audit period and voluntary post rotation period. Audit fees in the post-regulation period for mandatorily rotated engagements are significantly larger than in the pre-regulation period, but are discounted compared to audit fees for post-regulation continuing engagements.

Hypothesis Development

We build on Kwon et al.'s (2014) argument through partitioning samples to capture managers' opportunity to manage earning and audit firms' incentives to accommodate managers to retain audit contracts. Kwon et al. (2014) find that audit quality is indifferent before and after 2006, the period the mandatory audit firm rotation policy was adopted. However, we hypothesise that managers' opportunity to manage earnings and auditors' incentives are different in specific policy periods. Figure 1 illustrates, in the first three-year period of the mandatory audit partner rotation policy, managers have an opportunity to manage earnings because audit

firms have an incentive to retain their clients. In the second three-year period of mandatory audit partner rotation, audit firm firms will know in advance that their tenure will end on a given date. Therefore, managers have limited opportunity to manage earnings and audit firms have no incentive to retain audit contracts. After the second three-year mandatory audit partner rotation period expires, firms are either required to adopt the audit firm rotation policy voluntarily or on a mandatory basis. In this period, managers have limited opportunity to manage earnings and audit firms have no incentive to retain audit contracts. Thus, this unique context allows us to evaluate the effect of the mandatory audit firm rotation policy on audit quality. As discussed above, we believe it is highly unlikely the audit quality will remain unaffected in all periods because of managers' opportunity to manage earnings and audit firms' incentives in different periods. If the auditor expertise hypothesis is true, audit quality will be lower after the implementation of the mandatory audit firm rotation policy sample compared to other benchmark samples. If the auditor entrenchment hypothesis is true, audit quality will increase after the implementation of the mandatory audit firm rotation policy sample compared to other benchmark samples. Therefore, we develop the following hypothesis based on the discussions above.

H1: The audit quality of the mandatory audit firm rotation sample will be different compared to the benchmark samples

Several studies have examined the relationship between audit firm "switch" type and audit quality. DeFond and Subramanyam (1998) find firms that a switch from Big6 to non-Big6 audit firms increase their level of abnormal accruals. Following DeAngelo (1981), numerous empirical studies find evidence suggesting that Big4 auditors provide higher quality audit information compared to Non-Big4 auditors (Becker et al., 1998; Khurana & Raman, 2004; Behn et al., 2008). Furthermore, organisations audited by large audit firms (Top 10 in China) are less likely to commit financial statement fraud (Lisic, Silveri, & Song, 2015). The literature provides three reasons why Big4 accounting firms have higher audit quality compared to Non-Big4. First, the income dependence of Non-Big4 auditors is higher than Big4, creating incentives for auditors to compromise their independence. Second, Big4 audit firms have higher incentives to retain their public image and reputation to avoid litigation risk (DeAngelo, 1981; Basu, Lee, & Jan, 2001). Third, Big4 auditors have better audit systems and professionals. In consideration of the "Big4's expertise", we classify 4 switch types (Big4 to Big4, Big4 to Non-Big4, Non-Big4 to Big4, Non-Big4 to Non-Big4) to test whether the Non-Big4 to Big4 switch type has a positive effect on audit quality. Based on the pervious literature, the audit quality of the sample that switch from Non-Big4 to

Big4 should increase. Hence, we develop the following hypothesis based on the discussions above.

> H2: The audit quality of the mandatory rotated audit firm sample will increase as firms are rotated from non-Big4 to Big4 audit firms.

RESEARCH DESIGN

Sample Selection

The sample consists of public firms listed on the KRX (Korea Stock-Exchange) market. All financial data, non-financial data, share price and audit tenure information are collected from the KIS-VALUE and the Data-Guide database systems. Figure 1 illustrates the major external audit policy changes to affect Korea from the 1980s. The auditor designation regime is replaced by the free audit engagement in 1982. After the Asian Financial Crisis, the FSC promulgate a 5-year audit partner rotation policy in 1997. In the same year, the mandatory auditor retention policy becomes obligatory, requiring firms to retain their external audit firms for at least three consecutive years. In 2001, the FSC implement the mandatory audit partner rotation policy, whereby audit partners are required to be rotated at least once every three years. The Korean regulatory authority introduces the policy of mandatory audit firm rotation in December 2003. The policy comes into effect from 2006 and ends in 2010 due to the introduction of IFRS and political pressure from accounting firms and corporate entities.

Firms adopted the mandatory audit firm rotation policies on a firm-by-firm basis. Therefore, to disentangle the effect of the mandatory partner rotation policy on audit quality from two benchmark samples, data is hand collected and firms are partitioned accordingly. Figure 1 illustrates the partitioning. The vertical partitioning illustrates if the firm sample is subject to the mandatory audit firm rotation sample (MROT). No mandatory rotation (NROT) sample firms are not subject to mandatory audit firm rotation. The horizontal partitioning captures managers varying levels of opportunity to manage earnings and audit firms' incentives to accommodate managers. We split the sample into three groups and two sub-groups over the sample, period 2000 to 2009. The first sample, the mandatory partner rotation sample (PROT henceforth) consists of firms subjected to the three-year mandatory partner rotation policy from 2000–2008. The PROT sample has been partitioned into two sub-samples, because auditors are likely to have different incentives in different periods. In PROT 1, the first three-year

period of the mandatory partner rotation policy, auditors have an incentive to accommodate clients because an audit firm could potentially retain the business of the client under a different partner. In PROT 2, the second three-year period of the mandatory partner rotation policy, auditors have no incentive to accommodate clients because of the imminent introduction of the mandatory audit firm rotation which does not allow client retention. The PROT 1 and PROT 2 sample firms adopted the mandatory audit firm rotation policy (MROT).

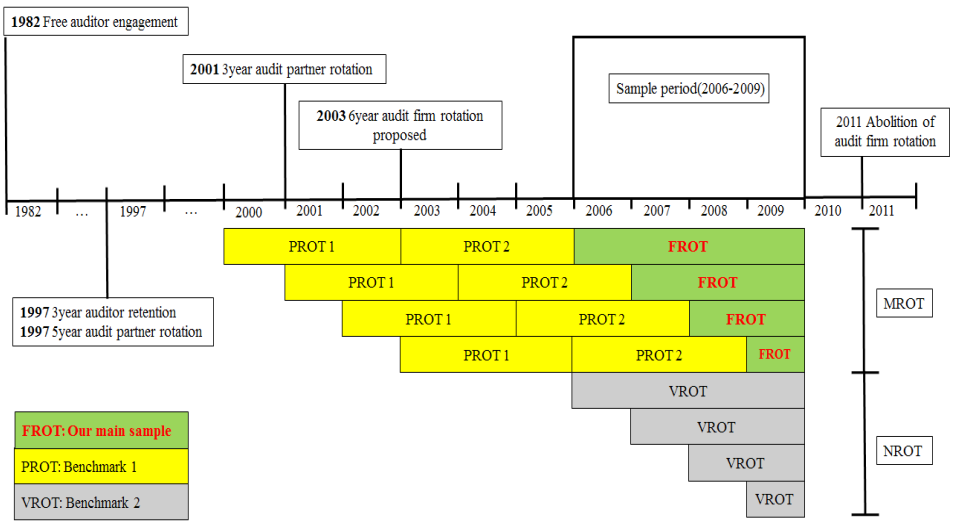

Figure 1. Major external audit policy changes, FROT sample and two benchmark samples

The second group of interests are organisations that voluntarily rotated their audit firms (VROT henceforth) from 2006–2009. VROT firms did not adopt the mandatory audit firm rotation (NROT). Our final group, our group of interests are firms that were required to adopt the mandatory audit firm rotation policy on obligatory basis (FROT henceforth) from 2006–2009. FROT firms are required to practice mandatory audit firm rotation (MROT). As depicted in Figure 1, period (PROT) 1 and 2 have a fixed-term of three years since listed firms are subject to the three-year mandatory auditor retention policy. Period 3 varies from 1 year to 4 years depending on the rotation year. For instance, for firms whose external auditors were mandatorily rotated in 2006, period 3 consists of 4 years (2006, 2007, 2008 and 2009); firms whose auditors were rotated in 2009, period 3 constitutes only one year (2009). The coexistence of both regimes during the period under consideration necessitates a careful decomposition of observations into target and benchmark samples. Given 0 is the period an audit firm is mandatorily rotated, PROT 1 indicates a three-year period from year –6 to year –4 and PROT 2 represents a

three-year period from year –3 to year –1. Thus, we compare the FROT sample, the mandatory audit firm rotation sample with the benchmark groups specified above; the VROT sample consisting of firms that adopted the mandatory firm rotation policy voluntarily and PROT, two subsamples (PROT 1 and PROT 2) consisting of the FROT sample prior to the adoption of the mandatory audit firm rotation policy.

Table 1 specifies the sample selection process for FROT and PROT. The PROT group consists of FROT firms partitioned into specific time periods before the rotation to capture the effect of audit policies on audit quality. From 2000 to 2010, we identify 664 firms listed on the KRX market from the KIS-VALUE database after excluding financial institutions. We then exclude 154 firms with no financial data, 20 firms whose auditors were rotated in 2010 and firms listed on an overseas market (Overseas firms did not adopt audit rotation policies), which leaves 490 firms. Firms rotated in 2010 are excluded for following reasons. First, K-IFRS early adopters in 2010 are not subject to mandatory rotation. Second, the number of firms subjected to mandatory rotation in 2010 was relatively small (20 firms). Finally, auditors knew in advance the mandatory audit firm rotation policy would be replaced in 2010 which may affect manager's opportunity and auditors' incentives. There are 144 VROT firms which are not subject to the mandatory audit rotation policy because of early voluntary adoption of the audit firm rotation policy.

Table 1
Sample selection

Mandatory rotation samples between 2006 to 2009	Number of firms
Non-financial companies	664
No financial data and non-financial available	(154)
Mandatory rotation in 2010	(20)
Potential samples	490
Overseas listings	(12)
Firms not subject to mandatory rotation	(144)
Total samples (2006–2009)	334

Table 2 presents the distribution of our mandatory rotation sample. Panel A shows the number of mandatory rotation firms, classified by year and type. Among the total sample of 334 firms, the most frequent rotations occurred in 2009 (105 rotations, 31.44%) and the least number of rotations occurred in 2007 (58 rotations, 17.37%). With regard to audit firm switch type, Big4 to Big4 switch is the most frequent switch type (145 rotation types, 43.41%) and switching from Non-Big4

exceeds 20% of the total sample. Specifically, Non-Big4 to Non-Big4 and Non-Big4 to Big4 switches occur on 71 occasions (21.26%) and 85 occasions (25.46%) respectively. A Big4 to Non-Big4 switch occurs less than 10%. Panel B exhibits the number of audit firm rotations since the 3-year auditor retention rule became effective in 1997. 36.23% of firms rotate their auditors twice and the cumulative ratio of firms that rotated their auditors more than three times exceeds 40%. We notice that frequent auditor switching is a common practice in South Korea. From 2000–2010, only 20.06% of firms change their auditor once.

Panel C shows consecutive auditor retention periods prior to the regulation of mandatory audit firm rotation. We investigate from 1982, because 1982 is the year that the free audit engagement system became effective. Prior to 1982, under auditor designation rule, firms were not allowed to select audit firms. The results based on the investigation of auditor retention periods between 1982 and 2010 show that 8 years of audit tenure exceeds 50% and 10 years of auditor retention occupies nearly 80% (78.44%). On the other hand, firms that retain their audit firms for more than 20 years occupy 6.59%. The longest retention period appears to be 25 years. Finally, Panel D reports industry classification. Our samples are classified by industry using two digit KSIC codes. The metal industry has the highest number of observations in our sample (12.87%), followed by the electrical machinery industry (10.78%), chemistry (9.58%) and the service industry (8.08%). The table shows that the sample firms are indiscriminately distributed throughout various industries.

Table 2
Distribution of samples

Panel A: Number of Mandatory Rotation Firms by Year and Type					
Number of samples by year			Number of samples by switch type		
Year	Number of Firm	Ratio (%)	Switch Type	Number of Firm	Ratio (%)
2006	71	21.26	Big4 to Big4	145	43.41
2007	58	17.37	Big4 to Non-Big4	33	9.88
2008	100	29.94	Non-Big4 to Big4	85	25.45
2009	105	31.44	Non-Big4 to Non-Big4	71	21.26
Total	334	100.00	Total	334	100.00

(*continued on next page*)

Table 2: (*continued*)

Panel B: Number of Auditor Rotations since Auditor Retention Regime

Number of Switches	Number of Firm	Ratio (%)	Cumulative Ratio (%)
1	67	20.06	20.06
2	121	36.23	56.29
3	96	28.74	85.03
4	44	13.17	98.20
5	6	1.80	100.00
Total	334	100.00	

Panel C: Consecutive Audit Tenure before Mandatory Audit Firm Rotation

Tenure	Number of Firm	Ratio (%)	Cumulative Ratio (%)
6 years	88	26.35	26.35
7 years	62	18.56	44.91
8 years	31	9.28	54.19
9 years	57	17.07	71.26
10 years	24	7.19	78.44
11 years	3	0.90	79.34
12 years	11	3.29	82.63
13 years	6	1.80	84.43
14 years	6	1.80	86.23
15 years	3	0.90	87.13
16 years	3	0.90	88.02
17 years	13	3.89	91.92
18 years	3	0.90	92.81
19 years	2	0.60	93.41
20 years	6	1.80	95.21
21 years	5	1.50	96.71
22 years	2	0.60	97.31
23 years	4	1.20	98.50
24 years	4	1.20	99.70
25 years	1	0.30	100.00
Total	334	100.00	

(*continued on next page*)

Table 2: (*continued*)

Panel D: Industry Classification					
Industry	Number of sample	Percentage (%)	Industry	Number of sample	Percentage (%)
Fishing	5	1.50	Medicine and medical	25	7.49
Food and beverages	24	7.19	Electrical machinery	36	10.78
Non-metallic minerals	4	1.20	Construction	23	6.89
Textiles	18	5.39	Metal working	12	3.59
Pulp and paper	11	3.29	Distribution	20	5.99
Metal	43	12.87	Transport and storage	11	3.29
Service	27	8.08	Others	13	3.89
Computer	30	8.98			
Chemistry	32	9.58	Total	334	100.00

RESEARCH DESIGN

Abnormal accrual model

Numerous studies use proxies for audit quality other than accruals based measures, which include auditor litigation (Heninger, 2001), propensity to issue a going concern opinion and benchmark beating (Carey & Simnett, 2006). However, these proxies based on publically available information have the potential to be influenced by organisational behaviour associated with legitimacy theory. Previous studies often use earnings response coefficients (Ghosh & Moon, 2005). The large majority of studies use signed and absolute abnormal accruals as proxies for audit quality (Heninger, 2001; Johnson et al., 2002; Richardson, Tuna, & Wu, 2002; Myers et al., 2003; Chi & Huang, 2005; Piot & Janin, 2007; Chen et al., 2008; Chi et al., 2009). Chi and Huang (2005) examine the effect of audit firm and audit partner tenures, using signed abnormal accruals as a proxy for audit quality. Other studies also use absolute abnormal accruals since earnings can be managed either upward or downward on terms favourable to management (Chen et al., 2008; Chi et al., 2009).

We use both signed and absolute values of abnormal accruals as proxies for audit quality. In deriving measures of abnormal accruals; we rely on the modified Jones model suggested by Dechow et al. (1995) and the performance-adjusted

Jones model suggested by Kothari et al. (2005), since Kothari et al. (2005) find that the inclusion of the firm's prior year performance better explains earnings management. To estimate abnormal accruals, we estimate residuals from the cross-sectional model, positive deviations from the residual are considered earnings management, hence lower accruals quality. Samples are cross-sectionally matched by year and industry.

Dechow et al. (1995) model

$$TACC_{i,t}/Assets_{i,t-1} = \alpha_1 1/Assets_{i,t-1} + \alpha_2(\Delta REV_{i,t} - \Delta REC_{i,t})/Assets_{i,t-1} + \alpha_3 PPE_{i,t}/Assets_{i,t-1} + \epsilon_{i,t} \quad (1)$$

where,
$TACC_{i,t}$: total accruals,
$Assets_{i,t\text{-}1}$: total assets of year t-1,
$\Delta REV_{i,t}$: change in revenue,
$\Delta REC_{i,t}$: change in accounts receivable,
$PPE_{i,t}$: gross amount of property, plant and equipment.

Kothari et al. (2005) model

$$TACC_{i,t}/Assets_{i,t-1} = \alpha_1 1/Assets_{i,t-1} + \alpha_2(\Delta REV_{i,t} - \Delta REC_{i,t})/Assets_{i,t-1} + \alpha_3 PPE_{i,t}/Assets_{i,t-1} + \beta_4 ROA_{i,t-1} + \epsilon_{i,t} \quad (2)$$

$ROA_{i,t\text{-}1}$: Return on Asset in period t-1

In Equation (3), we examine whether the mandatory audit firm rotation policy is associated with higher levels of abnormal accruals. Our dependent variables, AQ 1–4 are signed and absolute values of abnormal accruals established in Equations (1) and (2). Our primary variable of interest is ROT, which is a dummy variable that indicates 1 if an observation belongs to the mandatory rotation sample (FROT), 0 if either of the two benchmark groups (PROT or VROT). A negative relation between ROT and abnormal accruals would suggest that the mandatory audit firm rotation improved audit quality, supporting auditor *entrenchment hypothesis.* A positive relation would suggest that the mandatory audit firm rotation decreased audit quality, consistent with longer audit tenures improving audit quality, and the auditor *expertise hypothesis*. Statistically insignificant results would suggest no affect.

$$AQ_{i,j,t(j=1,2,3,4)} = \gamma_0 + \gamma_1 ROT_{i,t} + \gamma_2 Size_{i,t} + \gamma_3 CFO_{i,t} + \gamma_4 MKBK_{i,t} + \gamma_5 Lev_{i,t} + \gamma_6 Grw_{i,t} + \gamma_7 Deficit_{i,t} + \gamma_8 LAGTACC_{i,t} + ID + YD + \epsilon_{i,t} \quad (3)$$

Dependent Variables:

AQ_1(*DAMJ*): Abnormal accruals calculated using the modified Jones model, suggested by Dechow et al. (1995)
AQ_2(*DAKO*): Abnormal accruals calculated using the performance adjusted model, suggested by Kothari et al. (2005)
AQ_3(*ABMJ*): Absolute value of DAMJ (ABMJ)
AQ_4(*ABKO*): Absolute value of DAKO (ABKO)

Variables of Interest:

ROT1 : Dummy variable that is 1 if mandatory rotation samples, 0 if benchmark 1 sample (PROT)
ROT2 : Dummy variable that is 1 if mandatory rotation samples, 0 if benchmark 2 sample (VROT)

Control Variables:

Size : Natural logarithm of total assets
CFO : Cashflow from operations
MKBK : Market value to book value ratio
Lev *:* Debt ratio
Grw : Sales growth
Deficit : Dummy variable that is 1 if a firm experienced a loss, 0 otherwise
LAGTACC: Total accruals in previous year
ID : Industry fixed effect
YD : Year fixed effect

To demonstrate the validity of our model, and to increase the robustness of our findings; first, we identify the key determinants for abnormal accruals from previous literature (our main audit quality proxy) that include firm size, firm performance, business risk, firm growth, market opportunity, previous accruals effect, and financial loss. Second, we consider several potential proxies for each determinant, for instance ROA, ROE, ROS, and CFO as a proxy for firm performance. Finally, we select the best proxy for each category using scatter plot and correlation coefficients that best explain our dependent variable. To control for the effect of outliers, all variables are winsorised at top and bottom 1% level before the model specification process. Table 3 illustrates operational definitions of all the variables considered for this study.

First, we control for *Size*, defined as the natural logarithm of market value. We expect abnormal accruals for larger firms to be lower following the political cost hypothesis. However, previous earnings management studies report mixed

signs with respect to size variables. Second, we include CFO, since a negative relation has been documented between accruals and cashflow from operations (Dechow, 1994; Sloan, 1996). Third, we include MKBK (market value to book value ratio) to control for variations in firms' investment opportunity sets. Fourth, we include additional incentives to manage earnings such as Lev (debt ratio), and Grw (sales growth). Finally, we include a dummy variable for instances of loss reporting (Deficit) and (LAGTACC) controlling for the reversal effect of prior accruals (Ashbaugh, LaFond, & Mayhew, 2003). We do not include a variable to control for audit firm size since the switch type is tested separately.

Table 3
Model specification and variable definitions

Variables	Proxies	Definitions	Selected
Audit quality (DV)	DAMJ	Abnormal accruals computed from the modified Jones model, suggested by Dechow et al. (1995)	√
	DAKO	Abnormal accruals computed from the performance adjusted model, suggested by Kothari et al. (2005)	√
	ABMJ	Absolute value of DAMJ (ABMJ)	√
	ABKO	Absolute value of DAKO (ABKO)	√
Main Variables of Interest			
Effect of MAFR 1	ROT1 (FROT vs PROT)	Dummy variable that is 1 if mandatory rotation samples, 0 if benchmark 1 sample (PROT)	√
Effect of MAFR 2	ROT2 (FROT vs VROT)	Dummy variable that is 1 if mandatory rotation samples, 0 if benchmark 2 sample (VROT)	√
Additional Test Variables			
Effect of switch type	Switch type	Dummy variable that is one if Non-Big4 to Big4 switch type, 0 otherwise	√
Effect of audit tenure	Audit	Audit tenure length	√
Control Variables			
Firm Size	Size 1	Natural logarithm of total previous year total assets	√
	Size 2	Natural logarithm of market capitalisation	
Firm Performance	ROE	Return on Equity	
	ROS	Return on Sales	
	ROA	Return on Assets	

(*continued on next page*)

Table 3: (*continued*)

Variables	Proxies	Definitions	Selected
	CFO	Cash flow from operation/TA at time *t*-1	√
Firm Risk	Lev	Total liabilities/Total owners' equity	√
	Borrowings	Total borrowings/TA at time *t*-1	
	CF to lev	Cash flow to leverage ratio	
	CF to borrowings	Cash flow to borrowings ratio	
Firm Growth	Asset growth	(TA at time t/TA at time *t*-1)-1	
	OE growth	(OE at time t/OE at time *t*-1)-1	
	Sales growth	(Sales at time t/Sales at time *t*-1)-1	√
	OI_growth	(OI at time t/OI at time *t*-1)-1	
Other Determinants of DA			
Market opportunity	MKBK	Market to Book ratio	√
Effect of previous accruals	TACC	NI at time *t*-1 – CFO at time *t*-1	√
Loss firms	Deficit	Dummy variable that is one if a firm experienced loss, 0 otherwise	√

EMPIRICAL RESULTS

Descriptive Statistics

Table 4 presents descriptive statistics for our dependent variables. Panel A reports descriptive statistics and results of mean (median) difference tests of the mandatory rotation samples (FROT) versus two benchmark samples (PROT and VROT). First, we compare the mandatory rotation sample with itself in prior years. In the difference test, besides DAMJ, all accrual variables show significantly positive (+) signs for the FROT sample suggesting that abnormal accruals increased after the rotation period (compared to PROT). Likewise, abnormal accruals for FROT are generally larger than that the VROT sample. Thus, the univariate analysis suggest that the mandatory rotation sample has lower audit quality compared to the audit partner rotation policy sample firms, and firms that adopted the mandatory audit firm rotation voluntarily.

Table 4
Descriptive statistics

Panel A: Mandatory rotation and benchmark samples

Variables	Mandatory firms						Diff test	VROT (3)			Diff tests
	PROT (1)			FROT (2)			(2)-(1)				(2)-(3)
	Mean (Med)	Min (Max)	SD	Mean (Med)	Min (Max)	SD	*t* (*z*)	Mean (Med)	Min (Max)	SD	*t* (*z*)
DAMJ	0.02 (0.02)	–0.755 (1.51)	0.12	0.037 (0.03)	–1.47 (0.74)	0.14	1.57 (1.48)	–0.01 (–0.00)	–0.41 (0.49)	0.09	1.56 (1.49)
DAKO	0.01 (0.00)	–0.49 (1.62)	1.04	0.006 (0.01)	–1.412 (0.56)	0.02	2.24** (1.88)*	–0.00 (0.00)	–0.19 (0.17)	0.04	1.90* (1.82)*
ABMJ	0.01 (0.00)	0.00 (3.75)	0.15	0.10 (0.07)	0.000 (0.93)	0.12	2.57* (1.86)*	0.03 (0.04)	–1.12 (0.56)	0.12	3.46*** (2.53)**
ABKO	0.06 (0.03)	0.00 (1.66)	5.19	0.07 (0.04)	0.000 (0.556)	0.08	2.11** (2.42)**	0.02 (–0.00)	–15.41 (14.74)	1.92	2.15** (1.85)*
Obs.	1487			573				839			

Panel B: Mandatory rotation sample by sub-periods

	PROT1			PROT2			FROT		
	Mean (Med)	Min (Max)	SD	Mean (Med)	Min (Max)	SD	Mean (Med)	Min (Max)	SD
DAMJ	0.024 (0.015)	–0.503 (3.743)	0.193	0.026 (0.031)	–1.088 (0.493)	0.118	0.037 (0.029)	–1.471 (0.736)	0.147
DAKO	0.013 (0.027)	–0.429 (1.266)	0.108	0.014 (0.011)	–1.088 (0.354)	0.092	0.061 (0.013)	–1.412 (0.556)	0.015
ABMJ	0.086 (0.058)	0.013 (1.743)	0.111	0.084 (0.064)	0.000 (0.865)	0.083	0.104 (0.065)	0.000 (0.926)	0.119
ABKO	0.067 (0.046)	0.000 (1.266)	0.072	0.059 (0.043)	0.000 (0.429)	0.061	0.065 (0.042)	0.000 (0.556)	0.075
Obs.	743			744			573		

(*continued on next page*)

Table 4: (*continued*)

Panel C: Difference test between sub-periods (two-tailed *t*-test)			
	FROT vs PROT2	FROT vs PROT1	PROT2 vs FROT & PROT1
DAMJ	0.011 (1.49)	0.013 (1.37)	–0.003 (–0.47)
DAKO	0.007 (1.35)	0.017 (2.80)***	–0.002 (–0.43)
ABMJ	0.014 (2.67)***	0.011 (1.91)*	–0.007 (–1.60)
ABKO	0.011 (2.90)***	0.003 (0.82)	–0.009 (–1.76)*
Obs.	1317	1316	2060

Panel D: Pearson correlation of key variables					
	1. ROT	2. DAMJ	3. DAKO	4. ABMJ	5. ABKO
1. ROT	1				
2. DAMJ	0.051*	1			
3. DAKO	0.069	0.469***	1		
4. ABMJ	0.056**	0.3358***	0.192***		
5. ABKO	0.046**	0.0152*	0.0153**	0.661***	1

Notes: PROT = Mandatory audit partner rotation; FROT = Mandatory audit firm rotation; VROT = Voluntarily rotation ; SD = Standard deviation; DAMJ = Discretionary Accruals from Modified Jones model; DAKO = Discretionary Accruals from Kothari model ; ABMJ = Absolute value of DAMJ ; ABKO = Absolute value of DAKO ; Obs = Observations

In Panel B, we further partition PROT into two sub periods; PROT 1 (year –6 to year –4), PROT 2 (year –3 to year –1) when the rotation year is set to 0, and compare these samples with FROT (year +1 to year +4). In PROT 1, managers have an opportunity to manage earnings because audit firms have an incentive to retain their clients. In PROT 2, audit firm firms will know in advance that their tenure will end on a given date. Therefore, the managers of the PROT 2 sample have a limited opportunity to manage earnings and audit firms have no incentive to retain audit contracts. The managers of the FROT sample also have limited opportunity to manage earnings and audit firms have no incentive to retain audit contracts. The mean level of abnormal accruals, computed from both the modified Jones model and the performance adjusted model show an increase in the FROT sample. For instance, the mean of DAMJ increases from 0.024 to 0.026 to 0.037 over the three periods. The mean of DAKO is higher in the FROT sample (0.061) compared to prior periods (0.013) in PROT 1 and (0.014) in PROT 2. Thus, our results support the expertise hypothesis based on two factors. First, the levels of abnormal accruals increase in the FROT sample compared to PROT 2, a period when managers' opportunity and auditor firms 'incentives were similar. Secondly, the levels of abnormal accruals for the FROT sample is higher compared to PROT 1, a period when managers had an opportunity to manage earnings and auditors had an incentive to retain an audit contract. The results obtained from absolute values of abnormal accruals are qualitatively similar to afore-mentioned results, albeit with slight differences. For example, the mean of ABMJ is the highest in the FROT sample (0.104); the ABMJ average during PROT 2 (0.084) is slightly lower compared to PROT 1 (0.086). The mean of ABKO in PROT 1 (0.067) is lower than other samples. However, FROT exhibits a slightly higher ABKO average compared to PROT 2.

Panel C presents a difference analysis among different periods. The second and third columns compare FROT sample with PROT 2 and PROT 1 respectively. Although there are no statistically significant differences found in signed abnormal accruals between FROT and PROT 2, the absolute values of FROT appear to be larger. In comparison between FROT and PROT 1, DAKO and ABMJ show significant positive signs whereas DAMJ and ABKO do not. Thus, the data suggests that abnormal accruals, whether signed or absolute value based, tend to increase after the audit firm was rotated on a mandatory basis. The final column exhibits a difference test between period 2 (PROT 2) and, period 1 (PROT 1) and 3 (FROT). In period 2, auditors know in advance that they will be rotated mandatorily due to policy change, thus are less likely to have incentives to impair their independence. However, the results show that all abnormal accruals are not significantly different besides ABKO. Panel D outlines the results of Pearson correlation analysis among key variables. Our main variable, ROT, is generally significantly correlated with

all accrual variables suggesting positive linear correlations between poor audit quality and mandatory audit firm rotation.

Multivariate Analysis: Abnormal Accruals

Our results from OLS regressions using abnormal accrual measures as dependent variables are presented in Table 5. Panel A reports our findings comparing the FROT and sample with itself in prior years (PROT). Panel B reports our findings comparing the FROT sample with the sample that voluntarily rotated their audit firm (VROT). Panel A shows the coefficients for ROT, a dummy variable that is one if an FROT firm, 0 otherwise (PROT) are significantly positive (0.031 and 0.028) using absolute abnormal accruals (ABMJ and ABKO). The results suggest that the magnitude of abnormal accruals increases when auditors are mandatorily rotated. The coefficients are not significant for signed abnormal accruals (DAMJ and DAKO). We interpret that audit quality of firms that experience mandatory audit firm rotation is lower after the rotation compared to previous periods. Panel B shows that when the FROT sample is compared with the VROT sample, a sample consisting of firms not subject to the mandatory rotation policy, the ROT coefficients positive. The absolute value of abnormal accruals (ABMJ and ABKO) are significantly positive (0.019 and 0.026) suggesting that the level of abnormal accruals is higher for the sample that was mandated to rotate their auditors compared to the sample that adopted the policy voluntarily. The results are consistent with arguments made by opponents of the mandatory audit firm rotation, supporting the auditor expertise perspective. Our results are largely consistent with previous research suggesting that accounting failures and errors are likely to occur more frequently during the early stages following an audit firm change (Peirre & Anderson, 1984; Cercello & Nagy, 2004).

With respect to the control variables, we find that *Size* is generally positively associated with abnormal accruals, suggesting that larger firms use more abnormal accruals to manage earnings, inconsistent with political cost hypothesis. The *CFO* variable controlling for firm performance is positively associated with all dependent variables suggesting that firms with better performance use less abnormal accruals, consistent with findings in Dechow (1994) and Sloan (1996). *MKBK*, controlling for investment opportunity reveal inconsistent results. *Lev*, which controls for firm risk is generally positively associated with abnormal accruals, suggesting that firms with high debt ratios use abnormal accruals to increase reported earnings. Moreover, the *Grw* variable controlling for growth of firms is positively associated with abnormal accruals. In addition, the *Deficit* coefficient controlling for deficit firms and *LAGTACC* controlling for the reversal effect of prior accruals are generally significantly positive. Year fixed and industry effects are estimated.

Table 5
Abnormal accruals and mandatory audit firm rotation

$$AQ_{i,j,t(j=1,2,3,4)} = \gamma_0 + \gamma_1 ROT_{i,t} + \gamma_2 Size_{i,t} + \gamma_3 CFO_{i,t} + \gamma_4 MKBK_{i,t} + \gamma_5 Lev_{i,t}$$

Model : $+\gamma_6 Grw_{i,t} + \gamma_7 Deficit_{i,t} + \gamma_8 LAGTACC_{i,t} + ID + YD + \epsilon_{i,t}$

	Panel A: FROT vs PROT				Panel B: FROT vs VROT			
	DAMJ	DAKO	ABMJ	ABKO	DAMJ	DAKO	ABMJ	ABKO
Intercept	0.162	0.135	0.352	0.172	0.221	0.348	0.108	0.327
	(3.75)***	(2.11)**	(3.24)***	(2.69)***	(0.51)	(1.78)*	(3.52)***	(1.52)
ROT	0.006	0.009	0.031	0.028	0.042	0.003	0.019	0.026
	(0.72)	(1.62)	(2.24)**	(2.73)***	(2.29)**	(1.64)	(2.76)***	(3.23)***
Size	0.026	0.014	0.008	0.012	0.006	0.002	0.003	0.004
	(3.73)***	(4.73)***	(1.98)**	(2.31)**	(1.68)	(1.27)	(1.82)*	(2.42)**
CFO	–0.623	–0.627	–0.381	–0.029	–0.531	–0.525	–0.154	–0.026
	(–5.67)***	(–19.28)***	(–16.58)***	(–12.68)***	(–4.73)***	(–23.64)***	(–9.64)***	(–1.87)*
MKBK	0.014	0.006	0.016	0.015	0.004	0.004	0.004	0.008
	(1.72)*	(1.81)*	(2.94)***	(3.96)***	(1.21)	(0.34)	(1.91)*	(3.21)***
Lev	0.082	0.004	0.005	0.004	0.002	0.008	0.007	0.005
	(1.51)	(2.46)**	(5.27)***	(3.45)***	(1.57)	(4.35)***	(6.57)***	(4.76)***
Grw	0.026	0.033	0.027	0.017	0.019	0.023	0.022	0.016
	(2.16)**	(3.18)***	(3.68)***	(2.96)***	(2.37)**	(3.72)***	(2.86)***	(2.57)**
Deficit	0.142	0.122	0.004	0.028	0.123	0.032	0.014	0.024
	(16.64)***	(26.87)***	(0.72)	(6.14)***	(12.37)***	(18.72)***	(2.41)**	(4.87)***
LAGTACC	0.031	0.082	0.067	0.027	0.031	0.014	0.006	0.004
	(0.73)	(5.14)***	(3.14)***	(3.26)***	(7.51)***	(4.53)***	(1.83)*	(1.95)*
ID YD	Included	Included	Included	Included	Included	Included	Included	Included
Adj.R^2	0.3084	0.3627	0.2459	0.2467	0.2898	0.3214	0.1874	0.1957
F value	38.76***	29.49***	28.76***	23.54***	92.54***	181.52***	39.54***	42.51***
Obs.	2060	2060	2060	2060	1412	1412	1412	1412

The Effect of Auditor Switch Type and Audit Tenure

Our analysis suggests that the mandatory audit firm rotation policy is not effective in enhancing audit quality. The results show that the level of abnormal accruals increase after a firm adopts the mandatory audit firm rotation; firms that voluntarily adopted the policy have lower levels of abnormal accruals compared to firms that adopted the policy on a mandatory basis. Existing studies that examine the relation between audit switches and audit quality almost exclusively focus on audit firm tenure. Previous research suggests that the audit quality of Big4 firms is higher than Non-Big4 firms. To add robustness to our initial findings, we examine the

expertise hypothesis by testing if the audit quality of Big4 firms is higher than Non-Big4 firms. In order to test the effect of switch type, we identify four auditor switch types: Big4 to Big4, Big4 to Non-Big4, Non-Big4 to Big4, and Non-Big4 to Non-Big4. We calculate the relation between audit switch types with a switch dummy variable that takes the value of one if switch type is from Non-Big4 to Big4 or 0 otherwise.

Moreover, to add further robustness to our initial findings, we consider the effect of audit firm tenure. Over the past decade, archival literature finds evidence that audit quality increases in extended audit tenure (Myers et al., 2003; Chi & Huang, 2005; Chi et al., 2009). We attempt to test the robustness of our findings by including audit tenure length. We include the *audit* variable representing the length of audit tenure prior to the mandatory audit firm rotation policy. The audit tenure length ranges from 6 years to 25 years for the FROT sample and the 6-years tenure represents the PROT period. Moreover, we include the audit*ROT as a control. Our model to test the effect of switch type and audit tenure is estimated by the following model:

$$AQ_{i,j,t(j=1,2,3,4)} = \gamma_0 + \gamma_1 ROT1/2_{i,t} + \gamma_2 Audit_{i,t} + \gamma_3 Switch_{i,t} + \gamma_4 ROT * Audit + \gamma_5 ROT * Switch + \gamma_6 Size_{i,t} + \gamma_7 CFO_{i,t} + \gamma_8 MKBK_{i,t} + \gamma_9 Lev_{i,t} + \gamma_{10} Grw_{i,t} + \gamma_{11} Deficit_{i,t} + \gamma_{12} LAGTACC_{i,t} + ID + YD + \epsilon_{i,t} \quad (4)$$

Additional Variable:
Switch : Dummy variable that is one if Non-Big4 to Big4 switch type, 0 otherwise
Audit : Audit tenure length

Variables of Interest:
ROT1*Switch
ROT2*Switch

Table 6 illustrates our findings for the switch type effect and audit tenure. Panel A represents the results for the FROT sample versus the PROT sample. ROT, a dummy variable taking a value of 1 if a firm mandatorily rotated their audit firm or 0 otherwise. (PROT) shows that the level of absolute value of abnormal ABMJ and ABKO is higher (0.027 and 0.021) compared to PROT sample firms, suggesting FROT sample firms have higher levels of abnormal accruals compared to the PROT sample. However, the interaction term *ROT*switch*, our main variable of interest shows a significantly negative coefficient suggesting that abnormal accruals are smaller when auditors are rotated from Non-Big4 to Big4. The partial effect of a Big4 accounting firm on audit quality is –0.021 for ABMJ and –0.016 for ABKO. The Audit coefficient representing audit tenure, *audit* is statistically

negative for abnormal accruals (–0.003 ABMJ and –0.004 ABKO) suggesting that increased audit tenure has a positive effect on audit quality, consistent with previous findings (Chi & Huang, 2005; Carey & Simnett, 2006; Chi et al., 2009). However, the interaction term *ROT*Audit* shows a significant positive sign for ABMJ and ABKO despite insignificant signed abnormal accruals, suggesting that audit quality deteriorates when audit firms are mandatorily rotated after a period of 6 years, supporting the auditor expertise hypothesis. After controlling for audit tenure effect, the results for *ROT*switch* suggest that the mandatory audit firm rotation sample firms that switched from Non-Big4 to Big4 auditors have lower level of abnormal accruals.

Table 6
Audit tenure and Switch type effect (Accrual-based Measure)

Model :

$$AQ_{i,j,t(j=1,2,3,4)} = \gamma_0 + \gamma_1 ROT1_{i,t} + \gamma_2 Audit_{i,t} + \gamma_3 Switch_{i,t} + \gamma_4 ROT1 * Audit + \gamma_5 ROT * Switch + \gamma_6 Size_{i,t} + \gamma_7 CFO_{i,t} + \gamma_8 MKBK_{i,t} + \gamma_9 Lev_{i,t} + \gamma_{10} Grw_{i,t} + \gamma_{11} Deficit_{i,t} + \gamma_{12} LAGTACC_{i,t} + ID + YD + \epsilon_{i,t}$$

Panel A: FROT vs PROT

	DAMJ	DAKO	AB_MJ	AB_KO
Intercept	0.172 (2.85)***	–0.034 (–0.12)	0.3647 (8.2)***	0.0862 (2.85)***
ROT1	0.008 (0.59)	0.009 (1.37)	0.027 (2.53)**	0.021 (2.68)***
Audit	–0.001 (–1.60)	–0.005 (–1.84)*	–0.003 (2.06)**	–0.004 (–2.15)**
Switch	–0.005 (–0.79)	–0.003 (–0.76)	–0.008 (–1.93)**	–0.006 (–1.98)**
ROT1*Audit	0.001 (0.08)	0.006 (0.99)	0.001 (2.16)**	0.008 (2.01)**
ROT1*Switch	–0.012 (–1.07)	–0.007 (–0.99)	–0.021 (–1.87)*	–0.016 (–1.85)*
ROT2				
ROT2*Audit				
ROT2*Switch				
Size	0.025 (3.44)***	0.014 (4.73)***	0.009 (2.13)**	0.007 (2.22)**
CFO	–0.722 (–13.98)***	–0.724 (–17.78)***	–0.241 (–10.54)***	–0.027 (–11.66)***

(*continued on next page*)

Table 6: (*continued*)

Model :

$$AQ_{i,j,t(j=1,2,3,4)} = \gamma_0 + \gamma_1 ROT1_{i,t} + \gamma_2 Audit_{i,t} + \gamma_3 Switch_{i,t} + \gamma_4 ROT1 * Audit + \gamma_5 ROT * Switch + \gamma_6 Size_{i,t} + \gamma_7 CFO_{i,t} + \gamma_8 MKBK_{i,t} + \gamma_9 Lev_{i,t} + \gamma_{10} Grw_{i,t} + \gamma_{11} Deficit_{i,t} + \gamma_{12} LAGTACC_{i,t} + ID + YD + \epsilon_{i,t}$$

Panel A: FROT vs PROT

	DAMJ	DAKO	AB_MJ	AB_KO
MKBK	0.015 (1.53)	0.005 (1.83)*	0.012 (2.86)***	0.016 (5.32)***
Lev	0.095 (2.34)**	0.002 (3.03)***	0.005 (5.16)***	0.003 (4.55)***
Grw	0.023 (2.27)**	0.023 (5.21)***	0.023 (3.46)***	0.016 (3.43)***
Deficit	0.121 (13.39)***	0.118 (29.57)***	0.004 (0.64)	0.031 (7.01)***
LAGTA	0.027 (0.63)	0.079 (6.11)***	0.059 (3.06)***	0.058 (4.15)***
ID YD	Included	Included	Included	Included
Adj. R^2 (%)	0.3120	0.3771	0.2251	0.2095
F value	34.75***	27.26***	23.65***	20.49***
Obs.	2060	2060	2060	2060

(*continued on next page*)

Panel B represents the results for the FROT sample versus the VROT sample. Our primary variable of interest, *Mand*Switch* shows significantly negative signs for all the absolute value dependent variables (–0.029 and –0.012). This suggests that the positive sign of ROT was reversed to a negative coefficient due to the effect of Non-Big4 to Big4 switch type indicating the size of abnormal accruals generally decreased when auditors are mandatorily rotated from Non-Big4 to Big4 compared to other switch types. Our variable of interest with regards to audit quality is increasing with audit tenure. *Mand*Audit* is statistically insignificant, suggesting that the positive effect of longer audit tenure has dissipated due to the mandatory audit firm rotation. In summary, in our comparisons between PROT (VROT) and FROT, we find that audit quality generally increases when a company switches from a Non-Big4 to a Big4 accounting firm after controlling for the effect of audit tenure and other key determinants.

Table 6: (*continued*)

Model :

$$AQ_{i,j,t(j=1,2,3,4)} = \gamma_0 + \gamma_1 ROT2_{i,t} + \gamma_2 Audit_{i,t} + \gamma_3 Switch_{i,t} + \gamma_4 ROT2 * Audit + \gamma_5 Mand * Switch + \gamma_6 Size_{i,t} + \gamma_7 CFO_{i,t} + \gamma_8 MKBK_{i,t} + \gamma_9 Lev_{i,t} + \gamma_{10} Grw_{i,t} + \gamma_{11} Deficit_{i,t} + \gamma_{12} LAGTACC_{i,t} + ID + YD + \epsilon_{i,t}$$

Panel B: FROT vs PROT

	DAMJ	DAKO	AB_MJ	AB_KO
Intercept	0.205 (0.45)	0.673 (2.67)***	0.2145 (5.34)***	0.349 (1.45)
ROT1				
Audit	–0.012 (–2.51)**	–0.008 (–1.81)*	–0.011 (–2.52)**	–0.009 (–2.30)**
Switch	–0.019 (–1.99)**	–0.012 (–2.38)**	–0.031 (–3.67)***	–0.014 (–2.76)***
ROT1*Audit				
ROT1*Switch				
ROT2	0.037 (5.29)***	0.002 (1.51)	0.021 (3.19)***	0.037 (6.20)***
ROT2*Audit	0.001 (0.66)	0.001 (1.24)	0.003 (1.11)	0.002 (1.20)
ROT2*Switch	–0.027 (–1.47)	–0.021 (–1.65)	–0.029 (–2.27)**	–0.012 (–2.05)**
Size	0.004 (1.57)	0.001 (1.08)	0.004 (1.71)*	0.003 (2.31)**
CFO	–0.564 (–23.66)***	–0.561 (–22.35)***	–0.172 (–8.16)***	–0.024 (–1.91)*
MKBK	0.004 (1.35)	0.005 (0.26)	0.005 (1.84)*	0.008 (4.99)***
Lev	0.003 (2.57)**	0.004 (6.41)***	0.005 (5.88)***	0.004 (7.75)***
Grw	0.017 (2.71)***	0.016 (4.67)***	0.016 (2.94)***	0.009 (2.88)***
Deficit	0.111 (17.54)***	0.091 (23.85)***	0.012 (2.31)	0.021 (6.38)***
LAGTA	0.029 (8.68)***	0.007 (3.80)***	0.005 (1.83)*	0.007 (2.41)**
ID YD	Included	Included	Included	Included
Adj. R^2 (%)	0.2724	0.3450	0.1662	0.1249
F value	90.90***	196.46***	18.26***	34.66***
Obs.	1412	1412	1412	1412

ADDITIONAL ANALYSIS

Sub-Periods Comparison

Our sample is partitioned into three periods, period 1 corresponding to year –6 to year –4, period 2 corresponding to year –3 to year –1, and period 3 corresponding to year +1 to year +4, when the rotation year is set to 0. Under the three-year auditor retention regime, firms are required to retain their external auditors for at least three-years. Therefore, in period 1 (PROT 1), auditors may impair their independence since they may wish to renew a contract for another 3 years. In period 2 (PROT 2), audit firms are less likely to impair their independence since they know in advance that their contract will end on a given date due to the mandatory rotation regime. For brevity, we combine PROT 1 and PROT 2 as PROT in the main analysis because of similar results in table 3 (Panel B and C). For robustness, we perform additional analysis to test whether audit quality is affected by managers' opportunity to manage earnings and an audit firms' incentives to retain clients in different periods. We empirically test the PROT 1 and PROT 2 samples separately. Using Equation (1), we find that the coefficients for ROT are generally insignificant (besides DAKO), suggesting that audit quality of the FROT sample is indistinguishable from that of PROT 1 (untabulated). For the FROT versus PROT 2 regression, the absolute value of abnormal accruals appears to be positively correlated with ROT, suggesting that the magnitude of abnormal accruals is larger after firm rotation compared to PROT 2. Finally, for the three-way comparisons between PROT 2, FROT and PROT 1, the coefficients of ROT are generally insignificant; suggesting that audit the quality of PROT 2 is indifferent to other periods. These results are consistent with our previous finding, represented by PROT, (the PROT 1 and PROT 2 sample combined) that the mandatory audit rotation policy does not enhance audit quality using abnormal accruals.

Alternative Measure of Audit Quality

We use an alternative measure of audit quality proposed by Dechow and Dichev (2002). Dechow and Dichev (2002) propose a measure of accruals quality determined by the extent to which working capital accruals map into operating cash flow realisations. To investigate whether our previous results in our main analysis (Kothari and modified Jones model) are robust to the alternative measure of audit quality suggested Dechow and Dichev, we run regression model (3) replacing the abnormal accrual variables with the newly computed signed and absolute value of abnormal accruals as the dependent variable. This alternative test yields practically identical results. Untabulated results provide insignificant and

significantly positive relations between accrual measures and the ROT variable for signed abnormal accruals and absolute value of abnormal accruals respectively.

Positive and Negative Accruals

The explanation for no significant association between ROT and signed abnormal accrual variables may be due to the fact that positive accruals and negative accruals are offset against each other. Myers et al. (2003) argue that regulators are not solely concerned with the dispersion in accruals, but they are also concerned about the distortion in earnings due to inappropriate income-increasing or income-decreasing accruals. Earnings can either be managed upward (income-increasing) or downward (income-decreasing) on terms favorable to management. Myers et al. (2003) and Chi et al. (2009) also separate absolute abnormal accruals into positive and negative accruals. Following these studies, we identify positive and negative abnormal accruals to test whether new auditors restrict extreme income-increasing and/or decreasing activities. Previous studies posit that ordinary least squares (OLS) estimates can be considered biased in a truncated sample; therefore, we estimate a ML (maximum likelihood) truncated regression, consistent with previous studies (Greene, 2000; Myers et al., 2003; Chi et al., 2009). In untabulated results, we find mixed results. Specifically, for income-increasing accruals from DAMJ, the coefficient for ROT is significantly positive (0.006, $z = 2.69$) for FROT versus PROT comparison, suggesting that the FROT sample do not constrain extremely positive accruals compared to the PROT sample. Second, for income-decreasing accruals from DAMJ, the coefficient for ROT is insignificant (0.001, $z = 0.20$) for the FROT versus PROT comparison, suggesting that the audit quality of the FROT sample is indistinguishable from that of itself in prior years. All the coefficients for ROT for the FROT versus VROT comparison appear to be insignificant, again suggesting that there is no evidence supporting that the mandatory rotation regime enhances audit quality. The results from the DAKO partitions are consistent with above findings.

Alternative Tenure Proxies

We find a significant relationship between *Audit* (length of tenure) and the dependent variables, consistent with previous findings. As a further sensitivity analysis, the *Audit* variable was replaced by two additional dummy variables. The two dummy variables are audit tenure length of greater than 9 and 10 years in respective regressions. In these regressions, *Audit* is a dummy variable that takes the value of one if the length of audit tenure is greater than 9 years (10 years), 0 otherwise. Since our FROT sample has at least 6 years of prior audit tenure under the mandatory audit firm rotation policy, we intend to test whether longer audit

tenure prior to mandatory audit firm rotation affects audit quality following the auditor expertise hypothesis. Considering the cumulative percentage of six to eight years category of audit tenure before the rotation occupies 54.19% (See Panel C in Table 3), we compare our FROT sample with up to 8 years of previous audit tenure, with firms with more than 9 years (10 years) of previous audit tenure. Untabulated results are generally consistent with earlier results based on the accrual models. We find that the coefficients for Audit*ROT using absolute value of abnormal accruals are significantly positive at 5% (10%) for ABMJ (ABKO) in the FROT versus PROT regression. Despite the coefficients for *Audit*ROT* using signed abnormal accruals being positive, they appear to be insignificant. For the FROT versus VROT comparison, all the coefficients for *Audit*ROT* are positive but only significant using DAKO and ABKO as the dependent variables. In summary, abnormal accruals after the rotation are generally larger when length of previous audit tenure is longer. These findings suggest that the length of audit tenure has positive effect on audit quality, consistent with prior findings (Myers et al., 2003).

Real Earnings Management Metrics

Real earnings management (REM) is considered a deviation from 'normal' business practices to achieve a particular earning level (Roychowdhury, 2006). Management may use a combination of real earnings management and abnormal accruals as tools to manage their reported earnings. Alternatively, a firm may choose between the two earnings management mechanisms using the technique that is less costly to them (Mali & Lim, 2016). Zang (2012) reports the decision to engage in real earnings management or abnormal accruals earnings management is dependent on a firm's relative cost. By employing REM measures as dependent variables, we test whether firms subject to mandatory audit firm rotation are more likely to engage in opportunistic earnings management using REM after rotation. If the audit entrenchment hypothesis is true, client firms may have an incentive to engage in REM since audit firms' incentives to accommodate clients to retain contracts would cease.

We rely on prior studies to develop our proxies for real earnings manipulation. We combine the three individual measures established by Roychowdhury (2006). A positive deviation from the sample's normal level of real activities is considered real earnings management (the residual from one of the three estimation models). A negative deviation is interpreted as earnings management for our production cost measure (Prod). A positive deviation is interpreted as upward earnings management based on CFO and discretionary expenses (SGA). We combine the three individual measures to calculate two comprehensive metrics of REM

activities, as suggested by Cohen and Zarowin (2010). We multiply abSGA and abCFO by minus 1 to interpret positive values as positive earnings management and include both measures as the dependent variable in Equation (3).

$$TRM1 = abProd + abSGA*(-1) \quad (5)$$

$$TRM2 = abCFO*(-1) + abSGA*(-1) \quad (6)$$

where,
abCFO : Abnormal CFO is calculated using the Roychowdhury model (2006)
abProd : Abnormal production cost is calculated using the Roychowdhury model (2006)
abSGA : Abnormal discretionary expenses is calculated using the Roychowdhury model (2006).

Untabulated results show mixed signs for REM proxies in both comparisons, FROT versus PROT and FROT versus VROT. However, we do not observe a significant relationship between REM and audit policy. Thus, we conclude that the mandatory audit firm rotation policy has no effect on real earnings management.

Test for Predictive Validity

The main objective of our study is to examine the marginal effect of the mandatory audit firm rotation policy on audit quality. Therefore, for robustness, we establish our model's key determinants based on previous abnormal accrual and audit quality literature. To test the accuracy of our results, and to confirm the reliability of our findings, we use the cross validation technique to test the predictive validity of our model. First, we partition our entire sample into two data sets; training (60%) and holdout (40%) samples. Next, using the training sample, we conduct a stepwise regression and only include variables where the student *t*-value is greater than 2.00 (Woodside, 2013). As a result, we drop some redundant *t* predictors, overall the *adj-*R^2 increases. We repeat this process for every analysis determinant in this study to find the optimal model. Third, we test the newly specified model from the training sample, against the holdout sample. Finally, we test the predictive validity of the model using leave-one-out cross validation (a method to assess how the results of an empirical analysis will generalise to an independent data set).

We show the results of our earnings management models in Table 7. In short, the results are qualitatively unchanged. The root mean square residual (RMR) of the holdout sample, where zero RMR indicates a perfect fit ranges from 0.06 to 0.11 (slightly higher than the training sample). The mean absolute percentage

error (MAPE), where zero MAPE is a perfect fit, ranges from 0.06 to 0.14 (a little different to the training sample), suggesting that the models have a reasonably high predictive and explanatory power. Our results consistently suggest that audit quality of the mandatory rotation firm sample is lower or indifferent compared to the two benchmark samples. Moreover, non-big4 to big4 switches and audit tenure generally have a positive effect on audit quality.

Table 7
Test for predictive validity

Panel A: Earnings Management Model 1								
	Training Sample (60%)				Holdout Sample (40%)			
FROT vs PROT	DAMJ	DAKO	AB_MJ	AB_KO	DAMJ	DAKO	AB_MJ	AB_KO
ROT	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	(1.28)	(1.31)	(2.49)**	(2.19)**	(1.77)*	(1.54)	(1.93)**	(1.90)*
Obs.	1243	1243	1243	1243	817	817	817	817
Predictive Validity								
RMSE	0.08	0.07	0.07	0.06	0.10	0.09	0.09	0.07
MAE	0.06	0.05	0.05	0.04	0.07	0.06	0.06	0.05
FROT vs VROT								
ROT	0.02	0.01	0.03	0.03	0.02	0.03	0.03	0.05
	(1.60)	(1.17)	(2.07)**	(3.91)***	(1.34)	(0.42)	(1.81)*	(3.93)***
Obs.	728	728	728	728	684	684	684	684
Predictive Validity								
RMSE	0.12	0.08	0.11	0.06	0.11	0.10	0.09	0.08
MAE	0.08	0.06	0.07	0.04	0.08	0.07	0.06	0.06
Panel B:Earnings Management Model 2								
FROT vs PROT	DAMJ	DAKO	AB_MJ	AB_KO	DAMJ	DAKO	AB_MJ	AB_KO
ROT1	0.01	0.02	0.02	0.02	0.00	0.02	0.04	0.02
	(0.47)	(1.74)*	(1.73)*	(1.96)*	(0.13)	(1.73)*	(2.30)**	(1.65)
Audit	–0.00	–0.00	–0.00	–0.00	–0.00	–0.01	–0.00	–0.00
	(–0.92)	(–1.08)	(–2.67)**	(2.41)**	(–1.42)	(–1.79)*	(–2.47)**	(–2.21)**
Switch	–0.01	–0.00	–0.00	–0.01	–0.01	–0.02	–0.01	–0.01
	(–1.27)	(–1.06)	(–2.10)**	(–1.83)*	(–0.72)	(–1.59)	(–2.34)**	(–1.59)
ROT1*Audit	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.01
	(0.21)	(1.01)	(2.24)**	(1.60)	(0.51)	(0.55)	(1.78)*	(1.71)*
ROT1*Switch	–0.02	–0.01	–0.02	–0.01	–0.01	–0.01	–0.01	–0.01
	(–1.23)	(–0.90)	(–2.02)**	(–1.75)*	(–0.70)	(–0.88)	(–1.71)*	(–1.75)*
Predictive Validity								

(*continued on next page*)

Table 7: (*continued*)

FROT vs PROT	DAMJ	DAKO	AB_MJ	AB_KO	DAMJ	DAKO	AB_MJ	AB_KO
RMSE	0.08	0.07	0.07	0.06	0.10	0.08	0.08	0.07
MAE	0.06	0.05	0.05	0.04	0.07	0.06	0.06	0.05
FROT vs VROT								
ROT2	0.05	0.01	0.01	0.05	0.03	0.03	0.01	0.03
	(2.52)***	(1.47)	(2.36)**	(3.05)***	(1.72)*	(0.77)	(2.35)**	(1.94)*
Audit	–0.04	–0.02	–0.01	–0.01	–0.00	–0.02	–0.01	–0.01
	(–0.84)	(–0.69)	(–1.75)*	(–0.36)	(–0.52)	(–0.29)	(–1.93)*	(–1.38)
Switch	–0.03	–0.02	–0.08	–0.02	–0.02	–0.02	–0.03	–0.01
	(–0.97)	(–0.16)	(–3.71)***	(–1.36)	(–0.68)	(–0.47)	(–1.02)	(–0.25)
ROT2*Audit	0.03	0.03	0.01	0.02	0.01	0.03	0.01	0.01
	(0.65)	(0.84)	(1.42)	(0.82)	(0.45)	(0.34)	(1.57)	(1.16)
ROT2*Switch	–0.04	–0.02	–0.09	–0.01	–0.01	–0.01	–0.05	–0.03
	(–1.41)	(–0.83)	(–3.66)***	(–1.73)*	(–1.14)	(–0.43)	(–2.36)**	(–2.12)**
Predictive Validity								
RMSE	0.12	0.08	0.11	0.06	0.11	0.10	0.09	0.08
MAE	0.08	0.06	0.07	0.04	0.08	0.07	0.06	0.06

CONCLUSION

In this study, we investigate the effect of the mandatory audit firm rotation policy on audit quality using a Korean sample from 2000 to 2009. In Korea, a six-year mandatory audit firm rotation policy was introduced in 2006 on a firm-by-firm basis and was repealed in 2010. Our study is motivated by the uniqueness of the short-lived Korean experiment as well as the current debate surrounding the effectiveness of mandatory audit firm rotation, recently rekindled in the U.S. and Europe. The arguments in favor of the policy are based on the belief that longer audit tenure impairs audit quality. The Korean experience is a rare experiment, which lasted only for five years. We attempt to take advantage of Korea's case to examine the relationship between the mandatory audit rotation policy and audit quality.

Using accrual-based measures, we conduct a series of empirical tests to determine the association between the implementation of the mandatory audit firm rotation policy and changes in the level of audit quality. We find evidence suggesting that the audit quality of the mandatory rotation firms in post turnover period is generally lower relative to prior periods (mandatory audit partner rotation) or audit quality is indifferent. The results are consistent when audit quality of the mandatory sample is compared with that of firms not subject to the mandatory

audit rotation policy in the same sample period. A 'fresh view' and increased auditor independence under the mandatory audit firm rotation policy was expected to increase audit quality in South Korea. However, using abnormal accruals, audit quality is found to be higher under the mandatory audit partner policy. Our results suggest that the loss of firm specific knowledge after the adoption of the mandatory audit firm rotation period has led to a decrease in accounting quality compared to partner rotation periods, periods partners are able to cooperate. Previous studies have focused on the effect of audit quality after the implementation of the mandatory audit partner rotation or mandatory audit firm rotation using a before and after approach. However, our paper is the first to compare the mandatory audit partner and mandatory audit firm rotation policies. Our results suggest that the mandatory audit firm rotation does not perform its intended purpose to enhance audit quality. Moreover, in some instances, audit quality decreases compared to periods of mandatory audit partner rotation. We also find that the mandatory audit firms rotation sample whose auditors were rotated from Non-Big4 to Big4 are generally associated with lower levels of abnormal accruals due to the audit quality superiority of Big4 audit firms compared to Non-Big4. Finally, we find evidence that longer audit tenure has a positive effect upon audit quality.

Regulatory authorities should proceed with caution when considering the advantages of mandatory audit firm rotation as a policy with the potential to improve audit quality and auditor independence. We provide evidence supporting the auditor expertise in the Korean setting. The data suggests that mandatory audit firm rotation, a policy based on the auditor entrenchment hypothesis is not effective in enhancing audit quality. Given the substantial additional costs associated with changing an audit firm and the negative effect on audit quality after the adoption of the policy, we believe the policy is not justified.

Our study, to our knowledge, is one of the first to directly compare the effectiveness of mandatory audit firm rotation policy and the mandatory audit partner rotation policy. We note that accounting standards and other regulatory systems before the adoption of IFRS in Korea are similar to the U.S. Therefore, we believe that our findings could provide useful implications for policy makers in the U.S. and European countries wherein the mandatory audit firm rotation policy is emerging to be a controversial issue.

However, our study may have some limitations. We focus on the impact of the mandatory audit firm rotation policy on audit quality using abnormal accruals as proxies for audit quality. Whilst an extensive literature finds abnormal accruals to be a plausible proxy for audit quality, the proxy is not free from 'noise' (Chi et al., 2009). Also, we do not directly control for the mandatory audit partner period

using a dummy variable approach specifically due to the data unavailability. However, our approach, dividing our mandatory audit firm rotation samples into two different periods in which firms have different incentives to satisfy client's requirements to retain an audit contracts offer an unique insight, and adds additional robustness. Moreover, since our investigation is based on a unique institutional setting, our findings may not be readily generalisable to other nations with different legal and regulatory environments. In addition, the research period was short and overlapped the final crisis. However, despite these limitations, overall our results provide consistent evidence supporting the auditor expertise hypothesis, that the mandatory audit rotation policy did not improve audit quality in a Korean context.

REFERENCES

American Institute of Certified Public Accountants (AICPA). (1992). *Statement of position regarding mandatory rotation of audit firms of publicly held companies*. New York: Author.

Arrunada, B., & Paz-Ares, C. (1997). Mandatory rotation of company auditors: A critical examination. *International Review of Law and Economics*, *17*(1), 31–61. https://doi.org/10.1016/S0144-8188(96)00063-4

Ashbaugh, H., LaFond, R., & Mayhew, B. W. (2003). Do non-audit services compromise independence? Further evidence. *The Accounting Review, 78*(3), 611–639. https://doi.org/10.2308/accr.2003.78.3.611

Basu, S., Lee, S. H., & Jan, C. L. (2001). *Differences in conservatism between big eight and non-big eight auditors*, (Working Paper). Emory University, Atlanta, Georgia.

Becker, C., DeFond, M., Jiambalvo, J., & Subramanyam, K. R. (1998). The effect of audit quality on earnings management. *Contemporary Accounting Research, 15*(1), 1–24. https://doi.org/10.1111/j.1911-3846.1998.tb00547.x

Behn, B., Choi, J. H., & Kang, T. (2008). Audit quality and properties of analyst earnings forecasts. *The Accounting Review, 83*(2), 327–359. https://doi.org/10.2308/accr.2008.83.2.327

Blouin, J., Grein, B., & Rountree, B. (2007). An analysis of forced auditor change: The case of former Arthur Andersen clients. *The Accounting Review, 82*(3), 621–650. https://doi.org/10.2308/accr.2007.82.3.621

Brody, R. G., & Moscove, S. A. (1998). Mandatory auditor rotation. *National Public Accountant, 48*(5), 32–35.

Brunsden, J. (2011). *EU seeks to split big four auditing firms in rule overhaul*. New York, NY: Bloomberg. 5 December.

Carcello, J. V., & Nagy, A. L. (2004). Audit firm tenure and fraudulent financial reporting. *Journal of Practice and Theory, 23*(2), 55–69. https://doi.org/10.2308/aud.2004.23.2.55

Carey, P., & Simnett, R. (2006). Audit partner tenure and audit quality. *The Accounting Review, 81*(3), 653–676. https://doi.org/10.2308/accr.2006.81.3.653

Casterella, J., Knechel, W. R., & Walket, P. S. (2002). *The relationship of audit failures and auditor tenure* (Working Paper). University of Florida.

Chen, C., Lin, C., & Lin, Y. (2008). Audit partner tenure, audit firm tenure, and discretionary accruals: Does long auditor tenure impair earnings quality? *Contemporary Accounting Research, 25*(2), 415–445. https://doi.org/10.1506/car.25.2.5

Chi, W., & Huang, H. (2005). Discretionary accruals, audit-firm tenure and audit-partner tenure: Empirical evidence from Taiwan. *Journal of Contemporary Accounting and Economics, 1*(1), 65–92. https://doi.org/10.1016/S1815-5669(10)70003-5

Chi, W., Huang, H., Liao, Y., & Xie, H. (2009). Mandatory audit partner rotation, audit quality, and market perception: Evidence from Taiwan. *Contemporary Accounting Research, 26*(2), 329–358. https://doi.org/10.1506/car.26.2.2

Cohen, D., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting and Economics, 50*(1), 2–19. https://doi.org/10.1016/j.jacceco.2010.01.002

Dalton, M. (2011). *EU Proposes overhaul to audit rules*. New York, NY: The Wall Street Journal, 1 December.

DeAngelo, L. E. (1981). Auditor size and audit quality. *Journal of Accounting and Economics, 3*(3), 183–199. https://doi.org/10.1016/0165-4101(81)90002-1

Dechow, P. M. (1994). Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of Accounting and Economics, 18*(1), 3–42. https://doi.org/10.1016/0165-4101(94)90016-7

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting earnings management. *The Accounting Review, 70*(2), 193–225.

Dechow. P. M., & Dichev, I. (2002). The quality of accruals and earnings: The role of accrual estimation error. *The Accounting Review, 77*(4), 35–59. https://doi.org/10.2308/accr.2002.77.s-1.35

DeFond, M. L., & Francis, J. R. (2005). The audit research after Sarbanes-Oxley. *Journal of Practice & Theory, 24*(Supplement), 5–30.

DeFond, M. L., & Subramanyam, K. R. (1998). Auditor choice and discretionary accruals. *Journal of Accounting and Economics, 25*(1), 35–67. https://doi.org/10.1016/S0165-4101(98)00018-4

Deis, D. R., & Giroux, G. A. (1992). Determinants of audit quality in the public sector. *The Accounting Review, 67*(3), 462–479.

Geiger, M., & Raghunandan, K. (2002). Auditor tenure and audit report failure. *Auditing*: *A Journal of Theory and Practice*, *21*(1), 67–78. https://doi.org/10.2308/aud.2002.21.1.67

Ghosh, A., & Moon, D. (2005). Auditor tenure and perceptions of audit quality. *The Accounting Review, 80*(2), 585–612. https://doi.org/10.2308/accr.2005.80.2.585

Greene, W. H. (2000). *Econometric analysis*. Englewood Cliffs, NJ: Prentice Hall.

Healy, P., & Wahlen, J. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons, 13*(4), 365–383. https://doi.org/10.2308/acch.1999.13.4.365

Heninger, W. (2001). The association between auditor litigation and abnormal accruals. *The Accounting Review, 76*(1), 111–126. https://doi.org/10.2308/accr.2001.76.1.111

Johnson, V., Khurana, I., & Reynolds, J. (2002). Audit-firm tenure and the quality of financial reports. *Contemporary Accounting Research, 19*(4), 637–660. https://doi.org/10.1506/LLTH-JXQV-8CEW-8MXD

Johnstone, K., & Bedard, J. (2004). Audit firm portfolio management decisions. *Journal of Accounting Research, 42*(4), 659–690. https://doi.org/10.1111/j.1475-679X.2004.00153.x

Khurana, I., & Raman, K. (2004). Litigation risk and the financial reporting credibility of Big 4 versus non-Big 4 audits: Evidence from Anglo-American countries. *The Accounting Review, 79*(2), 473–495. https://doi.org/10.2308/accr.2004.79.2.473

Kothari, S., Leone, A., & Wasley, C. (2005). Performance matched discretionary accruals measures. *Journal of Accounting and Economics, 39*(1), 163–197. https://doi.org/10.1016/j.jacceco.2004.11.002

Kothari, S. P. (2001). Capital markets research in accounting. *Journal of Accounting and Economics, 3*(1–3), 105–231. https://doi.org/10.1016/S0165-4101(01)00030-1

Kwon, S. A., Lim, Y., & Simnett, R. (2014). The effect of mandatory audit firm rotation on audit quality and audit fees: Empirical evidence from the Korean audit market. *Auditing: A Journal of Practice & Theory, 33*(4), 167–196. https://doi.org/10.2308/ajpt-50814

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *Journal of Finance, 52*(3), 1131–1150. https://doi.org/10.1111/j.1540-6261.1997.tb02727.x

Lennox, C. S., Wu, X., & Zhang, T. (2014). Does mandatory rotation of audit partners improve audit quality? *The Accounting Review, 89*(5), 1775–1803. https://doi.org/10.2308/accr-50800

Lisic, L. L., Silveri, S., & Song, Y. (2015). Accounting fraud, auditing, and the role of government sanctions in China. *Journal of Business Research, 68*(6), 1186–1195. https://doi.org/10.1016/j.jbusres.2014.11.013

Mali, D., & Lim, H. J. (2016). Do firms engage in earnings management to improve credit ratings? Evidence from KRX bond issuers. *Korea Corporation Management Review, 23*(1), 39–61.

Myers, J., Myers, L., & Omer, T. (2003). Exploring the term of auditor-client relationship and the quality of earnings: A case for mandatory auditor rotation? *The Accounting Review, 78*(3), 779–799. https://doi.org/10.2308/accr.2003.78.3.779

Public Company Accounting Oversight Board (PCAOB). (2011a). *PCAOB to consider concept release on auditor independence and audit firm rotation*. PCAOB Press Release. Washington, DC: U.S. Public Company Accounting, 11 August.

PCAOB. (2011b). *Concept release on auditor independence and audit firm rotation: Notice of roundtable*. PCAOB Release No. 2011–006. Washington, DC: U. S. Public Company Accounting Oversight Board, 11 August.

Peirre, K., & Anderson, J. A. (1984). An analysis of the factor associated with lawsuits against public accountants. *The Accounting Review, 59*(2), 242–263.

Piot, C., & Janin, R. (2007). External auditors, audit committees and earnings management in France. *European Accounting Review*, *16*(2), 429–454. https://doi.org/10.1080/09638180701391030

Richardson, S., Tuna, I., & Wu, M. (2002). *Predicting earnings management: The case of earnings restatements*. (Working paper). University of Pennsylvania.

Ryan, S. G., Herz, R. H., Iannaconi, T. E., Maines, L. A., Palepu, K., Schrand, C. M., Skinner, D. J., & Vincent, L. (2001). SEC auditor independence requirements: AAA Financial Accounting Standards Committee. *Accounting Horizons, 15*(4), 373–386. https://doi.org/10.2308/acch.2001.15.4.373

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics, 42*(3), 335–370. https://doi.org/10.1016/j.jacceco.2006.01.002

Sloan, R. (1996). Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review, 71*(7), 289–315.

Woods, C. (2013). *Classifying South Korea as a developed market* (White Paper Report). FTSE Publications. Retrieved from http://www.ftse.com/products/downloads/FTSE_South_Korea_Whitepaper_Jan2013.pdf

Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: Calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *Journal of Business Research, 66*(4), 463–472. https://doi.org/10.1016/j.jbusres.2012.12.021

Zang, A. (2012). Evidence on the tradeoff between real activities manipulation and accrual based earnings management. *The Accounting Review, 87*(2), 675–703. https://doi.org/10.2308/accr-10196