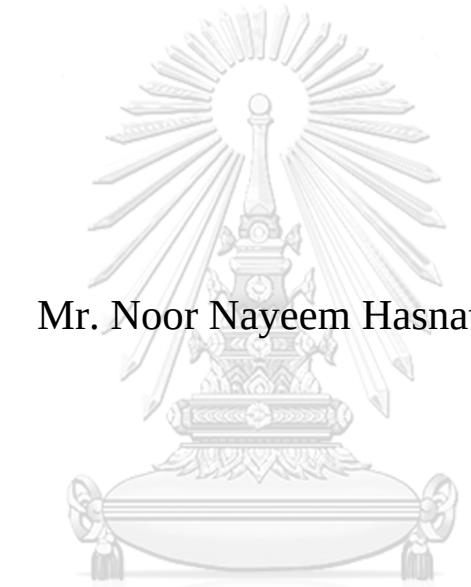
ACCRUAL-BASED EARNINGS MANAGEMENT AND REAL EARNINGS MANAGEMENT AROUND TWO KEY CORPORATE GOVERNANCE REGULATORY REGIME CHANGES IN THAILAND

Mr. Noor Nayeem Hasnat Farhan



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การตกแต่งกำไรผ่านรายการคงค้างและการตกแต่งกำไรที่แท้จริงในช่วงการเปลี่ยนแปลงกฎเกณฑ์การกำกับดูแลกิจการในประเทศไทยที่สำคัญ 2 เหตุการณ์

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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรมหาบัณฑิต
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By	Mr. Noor Nayeem Hasnat Farhan
Field of Study	Finance
Thesis Advisor	Associate Professor John Thomas Connelly, Ph.D.

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นูร์ นายีม ฮาซนัด ฟาร์ฮาน : การตกแต่งกำไรผ่านรายการคงค้างและการตกแต่งกำไรที่แท้จริงในช่วงการเปลี่ยนแปลงกฎเกณฑ์การกำกับดูแลกิจการในประเทศไทยที่สำคัญ 2 เหตุการณ์. (ACCRUAL-BASED EARNINGS MANAGEMENT AND REAL EARNINGS MANAGEMENT AROUND TWO KEY CORPORATE GOVERNANCE REGULATORY REGIME CHANGES IN THAILAND) อ.ที่ปรึกษาหลัก : รศ. ดร.จอห์น โทมัส คอนเนลลี่

ในประเทศไทยมีการประกาศหลักเกณฑ์ที่เกี่ยวกับการกำกับดูแลกำกับกิจการเพื่อเพิ่มความมีอิสระของคณะกรรมการบริษัทของบริษัทมหาชนที่สำคัญอยู่สองเหตุการณ์ ได้แก่การประกาศในปี พ.ศ. 2542 และในปี พ.ศ. 2551 งานวิจัยนี้ได้ศึกษาผลกระทบของการเปลี่ยนแปลงกฎระเบียบดังกล่าวต่อการตกแต่งกำไรผ่านรายการคงค้างและการตกแต่งกำไรที่แท้จริง การใช้การตกแต่งกำไรทั้งสองชนิดทดแทนกัน รวมถึงผลกระทบของระดับความเป็นเจ้าของโดยครอบครัวต่อชนิดและขนาดการตกแต่งกำไร ผลกระทบจากการประกาศกฎระเบียบทั้งสองครั้งมีผลต่อการตกแต่งกำไรที่แตกต่างกัน การทดสอบข้อมูลแบบตัวแปรเดียวพบว่าระดับการตกแต่งกำไรผ่านรายการคงค้างและการตกแต่งกำไรที่แท้จริงภายหลังการประกาศในปี พ.ศ. 2542 ไม่มีการเปลี่ยนแปลง ในขณะที่ภายหลังการประกาศในปี พ.ศ. 2551 พบว่ามีระดับการตกแต่งกำไรผ่านรายการคงค้างลดลง แต่ระดับการตกแต่งกำไรที่แท้จริงเพิ่มขึ้น ซึ่งหมายถึงกิจการใช้การตกแต่งกำไรที่แท้จริงทดแทนการตกแต่งกำไรผ่านรายการคงค้าง ผลการศึกษาจากสมการถดถอยพบความสัมพันธ์แบบเสริมจากการประกาศเปลี่ยนแปลงปี พ.ศ. 2542 แต่ผลการศึกษาไม่มีความเด่นชัด ในขณะที่ผลการศึกษาจากสมการถดถอยพบความสัมพันธ์แบบเสริมจากการประกาศเปลี่ยนแปลงปี พ.ศ. 2551 โดยผลลัพธ์ดังกล่าวมีความเด่นชัด เมื่อทดสอบในบริษัทที่มีระดับความเป็นเจ้าของสูงผลการศึกษายังคงเหมือนเดิม

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Noor Nayeem Hasnat Farhan : ACCRUAL-BASED EARNINGS MANAGEMENT AND REAL EARNINGS MANAGEMENT AROUND TWO KEY CORPORATE GOVERNANCE REGULATORY REGIME CHANGES IN THAILAND. Advisor: Assoc. Prof. John Thomas Connelly, Ph.D.

Two major corporate governance-related regulatory changes, one in 1999 and one in 2008, were implemented as a means to increase the independence of boards of directors of public companies in Thailand. I study whether each of these regulatory changes affects the degree of and leads to substitution of accrual-based earnings management (AEM) and real earnings management (REM), plus the effect of family ownership on the type and degree of earning management. The outcomes of the two regulatory changes are different with respect to earnings management. Univariate tests suggest no change in the levels of AEM and REM for the 1999 change. However, for the 2008 change, AEM decreases and REM increases, suggesting firms substitute between AEM and REM. Regression results suggests complementary relationship for regulatory change in 1999, however the results are not robust. Results for the 2008 regulatory change however provide robust evidence of a complementary relationship. The results are similar for firms with higher ownership concentration.

Field of Study: Finance Student's Signature .....
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Noor Nayeem Hasnat Farhan

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Chapter 1: Introduction

1.1 Background

In response to the Asian financial crisis, one cause of which points towards weak corporate governance, the Stock Exchange of Thailand (SET) responded with regulatory measures to meet greater calls for strengthening governance mechanisms in order to enhance board accountability and restore the integrity of the overall financial system. The SET in 1999 introduced its first regulation with respect to board composition: all listed firms must have an audit committee and the committee must have no less than three members with at least three members of the committee must be independent directors1. The Thai Security and Exchange Commission (SEC) re-recognized this regulation introduced by SET the 20031. Although the Thai SEC formally had recognized audit committee independence, the regulation may not have been an effective way of establishing higher degree of board independence. It could rather be argued that the regulation acted as an intermediate step for a rigorous board independence measure in the near future. Accordingly, in 2008 SEC revised the regulation stating independent directors must comprise of one-third of the board2. Motivated by the two distinct regulatory reforms that address oversight by the board in ensure integrity of the financial reporting, the primary empirical evidence that I provide in this study is that whether Thai listed firms that came into compliance with both the regulatory mandates in 1999 and 2008 substituted between accrual earnings management (hereafter AEM) and real earnings management (hereafter REM), given the higher degree of monitoring and scrutiny by the independent directors after each regulatory change.

1.2 Contribution

This study contributes to the growing earnings management and corporate governance literature in several aspects. First, I look at the earnings management substitution between AEM and REM taking advantage of two distinct regulatory

[1] See Appendix 1 for the timeline of the regulatory events
[2] See Appendix 1 for the timeline of the regulatory events

governance regime changes. This study on a standalone basis takes advantage of the two regimes change with respect to earnings substitution, one with audit committee independence in 1999 and a more rigorous mandate that alters the board composition ensuring a proportionate level of independent directors on corporate boards of Thai firms in 2008. To the best of my knowledge no prior studies have investigated the latter on a standalone basis. My motivation for this study follows Cohen et al. (2008). Their study provides evidence of U.S firms substituting between AEM and REM after passage of the Sarebanes-Oxley Act (SOX). However, SOX was passed with many other regulatory mandates unlike the mandates passed by Thai regulatory agencies in 1999 and in 2008 which targeted board independence specifically. The inclusion of other regulatory mandates in SOX Act adds noise to the study of Cohen et al. (2008), if looking solely in terms of the role of independent directors mitigating earnings management post-SOX. Consistent with the following, given higher regulatory and auditor scrutiny, I expect firms to substitute to REM from AEM post-regulatory reform given REM is harder to detect (Badertscher, 2011; Cohen et al., 2008). Additionally, the results would also show whether Thai firms engage in higher or lower degrees of AEM or REM with respect to pre and post regulatory reforms around the two mutually exclusive regulatory events.

Secondly, a majority of other studies explore earnings management substitution in western settings which typically feature strong investor rights, legal enforcement and dispersed ownership. Thailand, being an emerging economy, has a distinct institutional setting, weak investor rights and legal enforcement as well as concentrated ownership. These factors could drive different empirical results (Connelly, 2016; Leuz et al., 2003). In more similar institutional settings largely dominated by family firms, such as in Thailand, prior studies focused in East and Southeast Asian countries (e.g., Taiwan, Hong Kong, China) provide evidence on earnings management and its substitution specific to their country. Also, these studies did not revolve around the significance of changes in earnings management behavior surrounding several major regulatory events unlike this study. Despite growing theoretical evidence on earnings management and its substitution in emerging markets there is little evidence in the context of Thailand. Besides, country specific

characteristics tends to offer unique exploratory results. Although a recent study by Khunkaew et al. (2019) shed insights on earnings substitution in Thailand, their study showed association with firm level characteristics.

Since majority of the firms in Thailand are family governed firms (Boonlert-U-Thai et al., 2019), I also study the earnings management behavior of family firms in Thailand surrounding both the regulatory events. Again, to the best of my knowledge no prior study has explored the association between family firms and substitution of earnings management strategies by these firms surrounding major regulatory reforms in Thailand.

In order to test earnings management behavior of family firms, this paper uses the ownership classification categories as defined by La Porta et al. (1999). Additionally, ownership concentration effect on earnings management among Thai firms is tested by forming two groups classifying firms as high ownership concentration and low ownership concentration. Ownership concentration is a crude proxy for representing family ownership. Ownership concentration gives insight into the effect of earnings management not only of family firms rather also on institutional ownership.

Research Question

What significant degree of earnings management and its substitution is observed in Thai listed firms coming in compliance with the major regulatory reforms that addresses board independence and oversight in reflecting integrity of financial reporting?

Chapter 2: Literature Review and Hypothesis Development

2.1 Earnings Management Strategies

AEM refers to manipulating true reported earnings in a particular direction by purposefully changing accounting estimates or methods of transactions presented in the financial statement. Example include managers might change the method of depreciation or provision for doubtful accounts without making any adjustment to the

underlying transactions thus not affecting the cashflow (Gao et al., 2017; Zang, 2012). Conversely, REM is achieved by manipulating earnings by changing underlying operational activities such as reducing R&D expenditures, cash discounts to boost sales and overproducing to reduce cost of goods sold. AEM does not have direct effect on cashflow of a business (Braam et al., 2015; Gao et al., 2017; Zang, 2012). However, REM is considered as a costly strategy compared to AEM because the REM alters the timing and structure of actual operating activity transactions and so has a direct effect on the cashflow, resulting in long term negative consequences on business performance (Braam et al., 2015; Cohen et al., 2010; Gao et al., 2017; Zang, 2012; Zhu et al., 2015). Followed by globally publicized accounting scandals and higher regulatory scrutiny on accounting practices, businesses were induced to shift away from AEM to REM since REM is harder to detect by auditors (Badertscher, 2011; Cohen et al., 2008).

Several previous research studies in the U.S suggest although firms prefer to manipulate earnings through REM, based on the relative costliness of AEM and REM, firms substitute between the two strategies (Badertscher, 2011; Cohen et al., 2008; Cohen et al., 2010; Zang, 2012). However, due to weak institutional and legal enforcement in Thailand the incentives of earnings management could be different from what is observed in western settings. Leuz et al. (2003) observes less earnings management in countries with dispersed ownership structures, strong investor rights and legal enforcement compared with countries in emerging economy with concentrated ownership and weak investor protection. Countries with such institutional background, experience greater private control benefits which ranges from private consumption to transferring firm's resources to other firms being controlled by the insiders. Ball et al. (2003) also finds similar evidence and documents that private benefits of control and managerial incentives to manipulate financial reporting is strongly influenced by a country's institutional factors. Similarly, Shen et al. (2007) provides evidence that large firms in emerging markets are more inclined towards earnings management.

The notification of the Thai SEC implies that independent directors play a critical aspect of monitoring and disciplinary role (Chen et al., 2017). Independent directors play a major role in vetting the accuracy of financial reporting implying with an increase in independent directors the manipulation of earnings should fall (Xie et al., 2003) . Chen et al. (2015) states that in comparison to other directors, independent directors are less subject to managers' influence and hence are more objective on their monitoring role. Dahya et al. (2007) finds that companies in U.K. that came into compliance with the Cadbury Report had significant improvement in operating performance. In another study, Peasnell et al. (2005) provide evidence that after the enforcement of Cadbury Committee Report, which required firms in UK to appoint more independent directors, earnings management was significantly reduced. Klein (2002), looking at largely traded U.S firms, finds a strong negative association between board and audit committee independence and AEM. Taiwan has a similar institutional setting as Thailand since Taiwanese firms belong to an emerging market with weak legal enforcement and investor rights and are largely family dominant firms. In this similar institutional setting Chen et al. (2007) document that independent directors with financial expertise alongside voluntary formation of higher number of independent directors lead to lower level of earnings management among Taiwanese firms. Charoenwong et al. (2009) document weak evidence of earnings management in Singaporean and Thai firms between 1975 and 2003. In contrast to the previous findings in similar institutional settings, Xie et al. (2003) state that firms in Thailand with large board sizes and higher numbers of independent directors experience higher levels of earnings management. They also found very little impact on earnings management in the presence of controlling shareholders and firms using the big four audit firms.

Klein (2002) documents boards/audit committees composed of less than a majority of independent directors are more likely to have larger degree of AEM, implying firms that move from majority to minority independent board structure experience higher AEM than their counterparts. Another study by Chen et al. (2015), measuring REM with respect to independent directors pre and post regulatory reform, find on average there is no significant decrease in earnings management. In their

study, Chen et al. (2015) referenced a survey by KPMG in 2004 and 2010 that sates independent audit committee members report that management information prepared before audit committee meeting are of moderate/low quality and the independent committee members often need to establish relationships with managers to obtain useful information. Peasnell et al. (2005) find that audit committees do not have a direct effect on the downward degree of earnings manipulation when pre-managed earnings exceed thresholds by a large margin.

Consistent with the above, although board independence is a critical factor for effective monitoring, independence alone is not sufficient. To fully evaluate certain managerial actions requires sufficient firm specific knowledge and expertise in order to ensure effective monitoring (Chen et al. (2017). Investigating this further evidence shows that outside directors are not necessarily more efficient in their monitoring than their counterparts due to an informational disadvantage hence leading to a trade-off between being informed and independence. Independent directors are less informed about day-to-day operational activities since they need to heavily rely on management to provide them with information and at the same time these directors are busy with other activities outside the firms implying might not exert sufficient effort and time to bridge the informational gap (Armstrong et al., 2014; Chen et al., 2017). This evidence is further analyzed by Armstrong et al. (2014). The authors find evidence that when the cost of information acquisition, which is measured by availability and homogeneity of analyst consensus with narrow forecasting error, is lower the greater transparency of the firm to the independent directors. Duchin et al. (2010) finds similar evidence that lower cost of acquisition information only enhances effectiveness of board monitoring.

Non- CEO insider directors hold proprietary information about the firm and often do not exert strong interest as independent directors in scrutinizing CEO decisions (Chen et al. (2017). The authors further state given the alignment of interest of insider directors with independent directors, insider directors are more willing to share essential information about the firm and the basis of the CEO's decisions. This enhances independent directors monitoring role. It could be implied that given

concentrated ownership structure in Thailand there might be dealignment of interests between independent and insider directors which hinders independent directors monitoring role and their ability to scrutinize questionable transactions to substantially mitigate the level of earnings management.

Cohen et al. (2008) states that REM is more difficult to detect and requires more firm specific knowledge to scrutinize since the strategy is considered as deviations from normal business practices. Independent directors therefore require higher information medium and proprietary information from the insider directors to effectively address REM. Chen et al. (2017) states that outside directors could be ineffective in detecting REM without sufficient firm-specific knowledge. They fail to find evidence of an association between board independence and REM, implying independent directors in general are not effective monitors of REM due to informational disadvantages. In extending their study, they found significant evidence that independent boards are more effective monitors of REM with better information about managerial behavior when the cost of information is lower. In line with that, Chen et al. (2015) also find that a richer information environment for independent directors leads to an significant decrease in REM.

2.2 Earnings Management Substitution

The incentives to keep AEM undetected have become greater after the passage of SOX in the U.S than in earlier periods. Together with higher regulatory scrutiny on accounting standards globally, managers maybe incentivized to shift to REM. Given the nature of transactions being manipulated by this method of earnings management it is less likely to be scrutinized by the auditors (Cohen et al., 2010; Graham et al., 2005).

However, REM potentially destroys firm performance in the long term as it impacts the cashflow (Badertscher, 2011; Graham et al., 2005). REM on the other hand draws less scrutiny from auditors and regulators and hence is less costly in the short run leading managers to prefer REM over AEM. Prior research shows that managers face different levels of constraints in managing earnings leading to either

stop managing earnings or engage in different type of earnings management strategies (Badertscher, 2011) . During the fiscal year REM is used to manipulate earnings. Thereafter, based on the outcome (relatively high or low), the level of AEM is adjusted (Zang, 2012). Since managers substitute between AEM and REM based their effectiveness and costliness, the implication is that testing for either type separately does not lead to a definitive conclusion (Braam et al., 2015; Cohen et al., 2008; Cohen et al., 2010; Fields et al., 2001; Zang, 2012).

Cohen et al. (2008) states empirical evidence following the Sarbanes-Oxley Act (SOX), U.S based firms substitute between AEM and REM. Their results suggest that post-SOX, firms shifted from AEM to REM which shows that pre-SOX firms manipulated earnings using AEM. Post-SOX, with higher scrutiny from regulators and independent directors, the demand for earnings manipulation not being detected became higher leading to significant increases in REM. The authors further state a significant negative relation between the level of AEM and the level of unexpected REM which is also consistent with Zang (2012) findings that managers manipulate AEM after the fiscal year end based on the realized level of REM.

Zang (2012) further provides evidence on manager's decision for trade-off between AEM and REM due to their relative costliness and also a series of factors such as industry competitiveness, financial condition, monitoring by institutional investors and tax expenses that affects the trade-off between the two earnings management strategies. Cohen et al. (2010) states firm's trade-off between AEM and REM around seasoned equity offerings (SEOs) which depends on the firm's ability to use AEM relative to its costs.

In another study, Zhu et al. (2015) investigates earnings management on U.S listed Chinese reverse merger firms engaging in both REM and AEM relatively higher than non-reverse merger Chinese firms and U.S firms in general. Their study further states that in year of the reverse merger, firms engage in AEM and in the subsequent year after the reverse merger these firms substitute to REM due to constraints in engaging in AEM. Braam et al. (2015) indicates that politically connected firms are more likely to substitute to REM despite the strategy being costly. However, level of

substituting more (less) REM for AEM is conditional on the level of public monitoring in a country. Firms in China belonging to provinces with less stringent legal environment, firms with a dual listing and with higher growth prospects are more likely to engage in AEM due to lower costliness whereas firms facing lower government intervention along with weak corporate governance and poor financial condition engage in REM (Gao et al., 2017).

2.3 Earnings Management and Family Firms

Thai firms are largely family-owned with high ownership concentration. A study shows 70% of Thai firms are family owned while 49% are still run by the founding family (Boonlert-U-Thai et al., 2019). In comparison to other East Asian countries, Thai firms on average were found to have 36.32% concentration on voting rights which is highest among East Asian countries based on data provided by Fan et al. (2002), which implies controlling owners have more governance manipulating power (Claessens et al., 2000; Connelly et al., 2012). It could be argued that the controlling owner in such an environment displays either entrenchment effect or alignment effect (Wang, 2006).

According to Wang (2006) the relationship between family ownership and family's intention to manipulate financial reporting could be described by either entrenchment or alignment effect. The entrenchment effect refers to family board members opportunistically managing earnings to expropriate earnings from the minority shareholders. In the alignment effect, the controlling family has a majority shareholding possesses a strong commitment towards reporting high quality earnings to preserve family reputation and wealth. This also signals strong long term performance of the firm (Chi et al., 2015) . Additionally, several studies find evidence due to high concentrated ownership, weak legal system and ineffective corporate governance mechanisms Asian family-owned firms show entrenchment effect by reducing financial reporting quality implying these firms has the incentive to manipulate accounting disclosures (Chaney et al., 2011; Chi et al., 2015; Fan et al., 2002).

Connelly et al. (2012) argue that family firms in Thailand increase the number of independent directors and promote other good governance practices. However pyramidal ownership allows them to maintain absolute control to manipulate corporate decisions at the expense of minority shareholders. Additionally, independent directors are often appointed by family run boards for advisory roles rather than to carry out monitoring and controlling responsibilities (Anderson et al., 2004; Johnson et al., 1996). Family run boards dominate and influence decisions of independent directors since family members have control over appointment of these directors which eventually leads independent directors to favor decisions made by the controlling family (Jaggi et al., 2009; Johannisson et al., 2000). This evidence indicates that independent directors are not able to effectively reduce earnings management in family-controlled firms.

Insider controlled firms in countries with lower investor protection are more likely to engage in earnings management (Gopalan et al., 2012). Attig et al. (2020) found family-controlled firms in East Asian countries substitute to REM from AEM despite the risk of negative long-term effect on the firm's valuation. Family firms engaging in REM implies their intention to expropriate corporate resources from minority shareholders. Attig et al. (2020) further explains since family firms have longer term investment horizon the negative impact on valuation caused by REM might offset during the lifetime of their investment horizon. Additionally, managers in family firms undertake REM to signal superior performance and management practices.

However, Razzaque et al. (2020) show evidence post corporate governance reform in Bangladesh independent directors effectively could reduce REM in family firms compared to non-family firms. Contrary, a study based in Hong Kong shows that higher proportion of independent directors could effectively reduce AEM in non-family firms compared to family firms (Jaggi et al., 2009). Chi et al. (2015) finds evidence that negative moderating effect of independent directors in mitigating AEM in Taiwanese family firms.

2.4 Hypothesis Development

2.4.1 Overall Level of Earnings Management

In 1999, the SET passed major regulatory framework changes making clear the distinction between independent directors, outside directors and audit committee members (Prachyangprecha, 2013). Under the regulation, Thai listed firms were required to have an audit committee and must have minimum of three independent directors in the committee. Although this regulatory regime change was an exogenous shock with a short implementation period, SET did not mandate any restriction on the overall composition of the board. Rather the regulation emphasized the introduction of independent directors in the listed companies. However, firms with larger board size had the opportunity to dominate the independent directors by their insider directors. This has led to a weaker degree of influence by independent directors resulting in not much benefit from introduction of audit committee independence.

The SEC in 2008 revised the regulatory framework with a more rigid mandate on board composition. The new regulation required firms to form one third of their board to be composed of independent directors along with the previous regulatory mandate passed in 1999 by SET on audit committee independence. This regulatory mandate was more restrictive in nature and had a significant degree of impact on the board composition. With a proportionate number of independent directors on boards, independent directors had a higher decision-making and monitoring influence. This has ruled out absolute dominance and influence of the insider directors on the independent directors since firms did not have the flexibility to change board structure in their advantage.

Existing literature on earnings management in western settings states a negative association between board along with audit committee independence and AEM (Klein, 2002; Peasnell et al., 2005; Xie et al., 2003). Graham et al. (2005) in their study reveals a survey in the U.S of 401 financial managers has higher preference towards manipulating earnings by REM. In a more similar institutional setting as Thailand with weaker legal enforcement and investor rights, Chen et al. (2007) provides evidence of lower earnings management with respect to board

independence in Taiwan. Similar results are stated by Charoenwong et al. (2009) for Thai and Singaporean firms while Chuangchote (2017) also provides similar results for only Thai listed firms. Tongkam (2019) studied association between board independent and REM in Thai firms and finds strong evidence of REM.

Consequently, the majority of the studies suggests earnings management can significantly be reduced in the presence of independent directors on board. However, majority of the studies (Chen et al., 2017; Chen et al., 2007; Chen et al., 2015; Chuangchote, 2017; Jaggi et al., 2009; Tongkam, 2019) investigates independent directors as an overall proxy with no clear evidence on direct effect of independence of audit committee on earnings management which this study investigates. This study also fills the gap of presence of no clear evidence with connection to earnings management across major regulatory regime changes in Thailand. Accordingly, this study attempts to shed more light on the association between earnings management behavior in Thailand and independence of the board. I investigate the degree of overall earnings management both AEM and REM. Given a higher degree of board independence which results in higher supervision and monitoring, I expect to see a downward degree of the overall earnings management (both AEM and REM). I therefore hypothesize pre-regime change for both the regulatory events in 1999 and 2008, the degree of overall level of earning management both AEM and REM is significantly higher and declines post regime change for both the regulatory events. However, I expect to see higher downward degree of overall level of earnings management both AEM and REM post the regulatory event in 2008, given the proportional balance in the board composition and the mandate being more restrictive in nature compared to the mandate passed in 1999. The hypothesis is based on the premise that after enforcement of the regulatory events there is greater monitoring and scrutiny from independent directors and audit committee leading to higher downward degree of earnings management.

H1a: The level of AEM declines post regulatory reform in 1999

H1b: The level of AEM declines post regulatory reform in 2008

H2a: The level of REM declines post regulatory reform in 1999

H2b: The level of REM declines post regulatory reform in 2008

2.4.2 Earnings Management Substitution

REM and AEM are generally substituted by managers due to their effectiveness and costliness implying testing either type separately does not lead to definitive conclusion (Braam et al., 2015; Cohen et al., 2008; Cohen et al., 2010; Fields et al., 2001). In this study I closely follow Cohen et al. (2008) who investigate firms trading off between AEM and REM following the Sarbanes-Oxley Act (SOX). The authors find that firms significantly scaled up their earnings manipulation from AEM to REM post SOX. Their evidence implies firms used AEM significantly pre-SOX whereas post-SOX, REM became prevalent due to the strategy being harder to detect and being less scrutinized by auditors and regulators. And also, REM being less costly in the short run leading managers to prefer REM over AEM.

Consistent with the view, I predict that firms substitute to REM from AEM post both the regulatory events of audit committee independence in 1999 and board independence through board composition mandate in 2008. Badertscher (2011) points out REM has comparatively lower detection costs since the strategy is not scrutinized by auditors to the same extent compared to AEM. They further explain if a manager engages in REM using transactions such as research and development expenses, these types of transactions are not scrutinized by the auditors or regulators. However, REM alters the structure and timing of the actual transactions which leads to a direct negative impact on the cashflow whereas AEM choices do not have direct effect on the cashflow (Cohen et al., 2010; Zang, 2012). This suggests that REM adversely affects the firm's valuation in the long run. Thus, even though REM is less costly managers does not solely rely on REM rather chooses to engage in REM after choices to engage in AEM is exhausted (Zang, 2012).

Studies also suggests that outside directors are not necessarily efficient in their monitoring than their counterpart insider directors due to informational disadvantage hence leading to a trade-off between being informed and independence (Chen et al.,

2017). The authors failed to find a significant relationship between board independence and REM suggesting there is certain degree of REM even when the degree of board independence is at its optimal level.

In the context of studies conducted in Thailand, Chuangchote (2017) finds no significance of AEM associated with board independence in Thai firms. However, her study specifically looked at AEM only, excluding the effect of REM. It might be the case that due to higher regulatory and auditor's scrutiny, firms substituted REM from AEM. Another implication of her study is that the sample period is between 2012-2016 which might not have captured the full effect of the regime changes given a lag between her sample period given the regulation was recognized in 2008 and implemented in 2010. This implies firms might have substituted REM from AEM over her study period given higher scrutiny and higher chances of detection of AEM in the post-regulatory period. (Cohen et al., 2008). Wardani et al. (2012) provide evidence that Thai firms use REM as a strategy for better business performance. In another study Khunkaew et al. (2019) looked at the association between earnings management substitution and firm characteristics and board profile, their evidence suggests Thai firms substitutes between AEM and REM looking at a period from 2014-2017. There is clearly a lack of evidence of the association to board independence and earnings management substitution across key regulatory reforms in Thailand. Consequently, I hypothesize Thai firms substitute between AEM and REM after both the regulatory reform events of audit committee independence in 1999 and mandate on board impendence in 2008.

H3a: Firms substitute between REM and AEM after regulatory reform in 1999

H3b: Firms substitute between REM and AEM after regulatory reform in 2008

2.4.3 Earnings Management and its Substitution of Family Firms

Boonlert-U-Thai et al. (2019) in their study on Thai family firms divided family firms in two distinct group: founding family firms, which refers to firms still controlled by the first-generation owners and the other group as other family firms which are controlled by either the second generation or family members as controlling

shareholders. They state a significant proportion of family firms are still being controlled by the first generation of the family with on average 35.9% of controlling ownership according to their sample. Additionally, they also provide evidence that founding family firms report higher earnings quality than other family firms. Consistent with the view several other studies provides evidence that founding family firms are less inclined towards opportunistic earnings manipulation given their long term investment horizon thus reflecting alignment effect (Boonlert-U-Thai et al., 2019; Chi et al., 2015).

Motivated by this along with Thailand's similarity in terms of weak legal protection and highly concentrated ownership structure of family firms, Thailand provides an interesting setting to investigate the overall of level of earnings management and its substitution in family firms with respect to both the regulatory events in 1999 and 2008. However, the data on family firms are not readily available from data service providers which has several considerations made to form analysis around earnings management behavior of family firms.

Prior literature defines family firms under several different classifications and ownership thresholds are set according to the researchers or as by law. This paper follows ownership classification categorization by (La Porta et al., 1999). The authors identified six types of ultimate controllers widely held, family, state, widely held financial institutions and other (widely held firms which are not included in the above categories). However, in I focus only on three ultimate controllers which are family, widely held, and state with threshold of control at 25% and lower threshold level at 10%[3].

Accordingly, this study investigates the association between family firms and the level of earnings management strategies AEM and REM with respect to both pre and post regulatory events in 1999 and 2008. I also investigate earnings management substitution between AEM and REM post regulatory events. Hence, I form the following hypothesis and expect to see a higher downward degree of earnings

[3] The methodology is discussed in broader detail in section 3.2

management post both the regulatory events and expect to see family firms substitute between AEM and REM.

H4a: Post-regulatory reform in 1999 the degree of AEM in firms with high family ownership declines compared to firms with low family ownership

H4b: Post-regulatory reform in 2008 the degree of AEM in firms with high family ownership declines compared to firms with low family ownership

H5a: Post-regulatory reform in 1999 the degree of REM in firms with high family ownership declines compared to firms with low family ownership

H5b: Post-regulatory reform in 2008 the degree of REM in firms with high family ownership declines compared to firms with low family ownership

H6a: Post regulatory reform in 1999 firms with high family ownership substitute between REM and AEM to a lower degree compared firms with low family ownership

H6b: Post regulatory reform in 2008 firms with high family ownership substitute between REM and AEM to a lower degree compared firms with low family ownership

Later in the study, as part of the robustness checks, I also test the effect of high and low ownership concentration on earnings management strategies and its substitution. The ownership concentration level is set at the top five and top ten shareholders, which allows broader insights on earnings management behavior of family and institutional ownership structures.

Chapter 3: Data and Methodologies

3.1 Sample and Data Collection

The data used for this study is obtained from Data-stream, published by Thomson Financial which includes 936 firms. I exclude 127 firms in the financial services industry, 1 firm in property fund & property investment fund (REITs), 31 firms delisted and firms undergoing corporate restructuring, and 10 state-owned

enterprises. Finally, 214 firms with data errors or incomplete data for variables being studied were excluded. The final sample covers 553 firms and 11,060 firm-year observations.

Under the industry classification of The Stock Exchange of Thailand (SET) firms from industries Agro & Food, Consumer Products, Industrials, Property & Constructions, Resources, Services and Technologies are included in the sample.

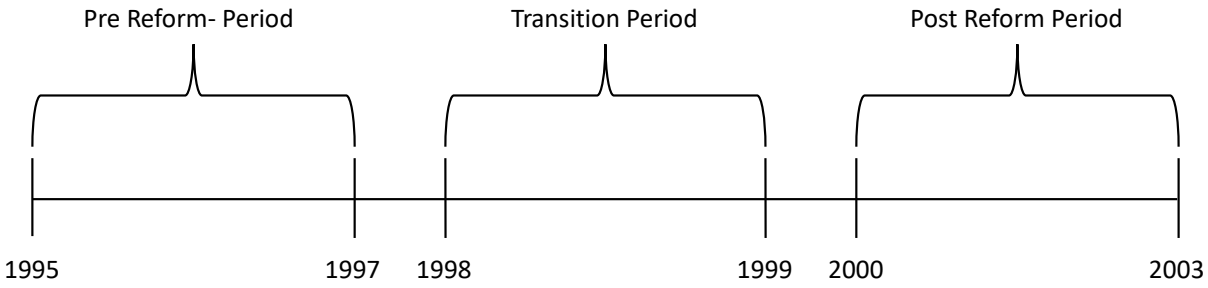
Table 1: Final Sample by Industry

Number	Industry	Frequency	%
1	Agro & Food Industry	1,280	11.57
2	Consumer Products	940	8.5
3	Industrials	2,340	21.16
4	Property & Construction	2,140	19.35
5	Resources	1,000	9.04
6	Services	2,480	22.42
7	Technology	880	7.96
	Total	11,060	100.00

The board composition data, which includes board size and number of independent directors for the entire sample period of regulatory events in 1999 and 2008, has been obtained from SETSMART data service, published by the Stock Exchange of Thailand.

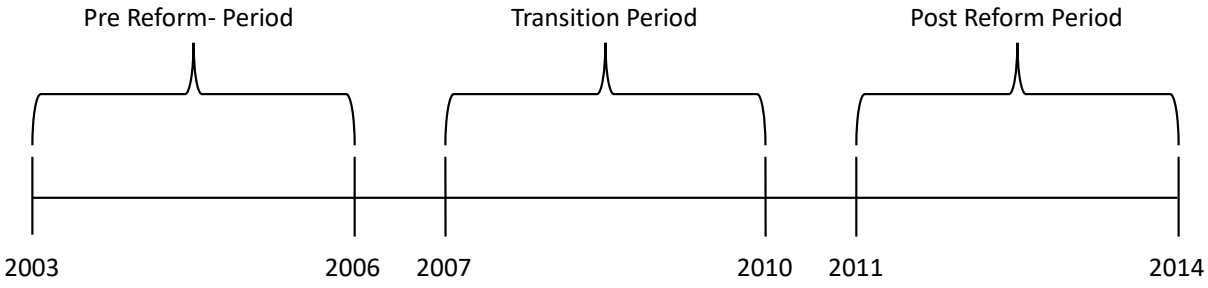
The sample period for the first regulatory event in 1999 is from 1995-2003. The period is shortened to 1994-2003 (Prachyangprecha, 2013) as due to a large number of missing values leading to mechanical issues in computing accruals and real earnings management. The sample is further divided into a pre-reform period, a transition period and a post-reform period as shown in Figure 1. The pre-reform period is defined from 1995-1997, transition period is defined from 1998-1999 and post-reform period is defined from 2000-2003. The transition period is defined to address the time frame firms require to adopt to the regulations as firms require sufficient time to comply with new regulations.

Figure 1: Timeline of Regulatory Event in 1999



The sample period for the second regulatory event in 2008 is from 2003-2014. The sample is further divided into pre-reform period, transition period and post-reform period as shown in Figure 2. The pre-reform period is defined from 2003–2006. This pre-reform sample period is 1 year longer than the pre-reform period of the regulatory event in 1999, recall as discussed above year 1994 is dropped due to large number of missing values that mechanically limits computation of earnings management proxies through regression analysis. The transition period is defined from 2007-2010 and post-reform period is defined from 2011-2014. The transition period for the second regulatory event is longer than the transition period defined for regulatory event in 1999. This is mainly because although the regulation was formally announced in 2008, the SEC allowed firms to adopt to the changes until 2010 given that board changes can take a considerable amount of time to be implemented. Also, this study considers the transition period for both the regulatory events one year earlier than the release date since such regulations are usually held for public hearing before its release.

Figure 2: Timeline of Regulatory Event in 2008



3.2 Sample for Family Firms

The data for family ownerships are often difficult to collect and this limitation added to several considerations made to assemble the sample of family firms. I use data of ownership classification categories and ownership concentration of publicly traded firms in Thailand from Connelly (2016) and Connelly et al. (2012). The main source of both the ownership dataset is the SETSMART data service, published by the Stock Exchange of Thailand. The author further explains the use of company shareholding records and annual reports. Cross-checking the data, the author also employed consultation of outside sources, example company filings at the Ministry of Commerce, an online database of company records provided by Business Online Co., Ltd., including other source of business directories.

The ownership classification categories as assembled by Connelly (2016) for firms in Thailand follows categories described by La Porta et al. (1999) which are also used is several subsequent papers such as Claessens et al. (2002) and Claessens et al. (2000) . La Porta et al. (1999) in their study identified six types of ultimate controllers which are widely held, family, state, widely held financial institutions and others (widely held firms which are not included into the above categories). However, in this study I use three ownership classification categories namely family, widely held and state where family ownership is coded as 1 and others (widely held and state) as 0.

The threshold of ownership to designate family ownership is set largely set by the researchers or as stated by the law. Some researchers use 50% ownership of voting rights to designate family control while others use lower threshold of 20% or 10% (Connelly, 2016). The relevance of the lower level of ownership is discussed by La Porta et al. (1999) where the authors provided evidence that 80% of entities can be controlled by owning less than 20% of shares. Moreover, some researchers designate family where a founder or family shareholder manages the company or is a board member while some use threshold level of ownership as low as 5% (Anderson et al., 2012).

Thai law recognizes the threshold for effective control at 25% rather than having absolute majority of shares which is greater than 50% (Connelly, 2016; Wiwattanakantang, 2001). Accordingly, this study uses the designation of ownership control at 25% and a lower cut off level at 10% of the outstanding shares.

However, due to data availability, the ownership classification data is taken as constant reference from the year 2010 as such ownership characteristics often remains fairly similar over the years. Thus, this partially affects the sample period of the regulatory event in 2008 from the year 2011-2014 (recall the sample period for regulatory event in 2008 is from 2003-2014). The sample is composed of 276 firms excluding financial firms, firms under rehabilitation and firms with missing data.

Additionally, this paper also studies the effect ownership concentration on earnings management strategies and its substitution. Overall ownership concentration allows greater insights into earnings management behavior of both family and institutional ownership. The ownership concentration data is designated as top five and top ten ownership concentration level. The sample size used in the analysis includes 529 firms.

Ownership concentration data is obtained primarily from SETSMART database, provided by the Stock Exchange of Thailand. Share ownership is identified from the database's list of top ten and five shareholding records.

Ownership concentration for the first regulatory event in 1999 median ownership level for all firms in the top ten shareholdings sample of 71.6% and in top five shareholding sample of 58.3% are designated as high ownership concentration. Median ownership exceeding for all firms for the regulatory event in 2008 sample of top five and top ten shareholdings of 57.6% and 70.3% respectively is designated as high family ownership. Similarly, ownership concentration below the median for all firms is designated as low ownership concentration. Accordingly dummy variable OWN_T5 and OWN_T10 is created which takes the value of 1 to indicate high ownership if the observation exceeds median ownership level concentration and 0 for low ownership concentration if the observation is below median ownership level .

Since the ownership concentration sample is crude proxy for family ownership, Table(s) 2, 3, 4 and 5 shows the mean top five and top ten ownership concentration values for three classification categories for both regulatory events in 1999 and 2008. This justifies the use of ownership concentration sample and gives broader insight into which ownership categories does the top five and top 10 ownership is concentrated.

However, it can be concluded from the descriptive statistics below that ownership data is only a crude proxy to represent family firms. Hence, the ownership sample used in the subsequent tests allows to only see the effect on earnings management and its substitution when ownership is concentrated.

Table 2: Average Top Five Ownership Concentration in Ownership Categories Sample for Regulatory Event in 1999

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Family Ownership Control Threshold at 10%									
Widely Held	27.8	29.9	29.1	28.2	32.5	25.7	25.6	26.8	25.2
State Owned	64.0	67.1	67.4	67.2	68.0	66.8	67.0	67.0	64.5
Family	53.8	55.4	55.9	55.9	56.5	57.0	56.9	56.3	55.4
Family Ownership Control Threshold at 25%									
Widely Held	43.1	43.3	43.9	44.5	45.7	42.5	40.5	39.0	38.0
State Owned	60.6	65.3	66.1	66.0	67.0	67.0	67.0	68.1	68.1
Family	55.9	57.5	58.4	57.8	58.5	59.6	60.3	58.9	58.1

Table 3: Average Top Ten Ownership Concentration in Ownership Categories Sample for Regulatory Event in 1999

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Family Ownership Control Threshold at 10%									
Widely Held	42.8	45.2	44.3	43.4	47.9	40.9	38.4	41.0	37.4
State Owned	71.2	74.0	76.0	75.5	75.2	74.4	74.7	74.0	71.5
Family	66.1	67.7	69.1	69.7	70.0	70.2	70.2	69.5	67.4
Family Ownership Control Threshold at 25%									
Widely Held	56.9	57.5	59.3	60.7	61.2	58.6	55.9	54.4	51.5
State Owned	65.5	70.3	73.3	73.1	72.9	74.3	74.7	74.8	75.1
Family	67.9	69.5	71.3	71.3	71.7	72.2	73.1	71.7	69.9

Table 4: Average Top Five Ownership Concentration in Ownership Categories Sample for Regulatory Event in 2008

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Family Ownership Control Threshold at 10%												
Widely Held	25.2	26.2	24.9	28.1	35.8	28.5	26.1	25.4	30.0	39.5	36.7	36.3
State Owned	64.5	64.3	61.2	61.2	59.3	59.9	59.5	57.9	54.9	56.7	53.0	53.5
Family	55.4	57.0	57.5	58.0	58.0	57.6	57.3	57.4	56.9	57.8	57.4	56.9
Family Ownership Control Threshold at 25%												
Widely Held	38.0	39.9	40.6	40.9	41.5	41.1	40.4	39.9	40.4	42.2	41.1	41.1
State Owned	68.1	68.3	64.2	64.4	65.7	66.7	65.7	63.6	60.3	62.7	58.4	58.8
Family	58.1	59.7	60.7	61.5	61.5	60.6	60.3	60.7	60.1	60.8	60.6	59.9

Table 5: Average Top Ten Ownership Concentration in Ownership Categories Sample for Regulatory Event in 2008

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Family Ownership Control Threshold at 10%												
Widely Held	37.4	37.8	36.3	41.2	47.6	40.1	36.6	35.7	39.4	48.5	45.2	45.0
State Owned	71.5	70.7	68.8	69.4	69.2	69.9	69.5	67.2	65.3	67.3	62.9	64.0
Family	67.4	68.8	69.1	69.9	70.1	69.9	69.6	69.4	68.7	69.4	68.7	68.2
Family Ownership Control Threshold at 25%												
Widely Held	51.5	53.0	53.7	54.2	55.3	54.7	53.4	52.7	53.0	54.7	52.9	53.2
State Owned	75.1	74.7	71.9	72.7	73.8	74.6	73.7	71.1	69.1	72.0	67.1	67.4
Family	69.9	71.3	72.0	73.1	73.3	72.6	72.2	72.2	71.6	72.0	71.6	71.0

3.3 Methodology

3.3.1 Accruals-Based Earnings Management Measurement

Following previous literatures (Cohen et al., 2008; Cohen et al., 2010; Khunkaew et al., 2019; Zang, 2012) I use the modified cross-sectional Jones model (Jones, 1991) which is later modified by Dechow et al. (1995) by adjusting revenue that accounts for the change in accounts receivable to capture accounting discretion from credit sales in calculating normal accruals. The model is used to capture discretionary accruals and can also be used as a model for nondiscretionary accruals.

Using the following equation total accruals are computed for each firm by industry and year:

$$\frac{TA_{i,t}}{A_{i,t-1}} = \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{\Delta S_{i,t}}{A_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{A_{i,t-1}} + \varepsilon_{it} \qquad (1)$$

where, for fiscal year *t* and firm *i*, TA represents total accruals defined as:

$TA_{i,t} = EBXI_{i,t} - CFO_{i,t}$ where EBXI is the earnings before extraordinary items and *CFO* is the cashflow from operations
A_{t-1} = Total assets at the end of firm *i* year t-1
ΔS_t = The change in sale for firm *i* in year $t = S_t - S_{t-1}$
$PPE_{i,t}$ = The gross value of property, plant and equipment for firm *i* in year *t*

The coefficient estimates from equation (1) will be used to estimate firm specific normal accruals ($NA_{i,t}$) for the sample firms as follows:

$$NA_{i,t} = \widehat{\beta_1} \frac{1}{A_{i,t-1}} + \widehat{\beta_2} \frac{(\Delta S_{i,t} - \Delta AR_{i,t})}{A_{i,t-1}} + \widehat{\beta_3} \frac{PPE_{i,t}}{A_{i,t-1}}$$

where $\Delta AR_{it} = AR_t - AR_{t-1}$ representing the change of accounting receivable in a year.

Discretionary accruals are calculated as the difference between total accruals and fitted normal accruals:

$$DA_{i,t} = \left(TA_{i,t}/Assets_{i,t-1}\right) - NA_{i,t}$$

Several studies on earnings management use the absolute value of accruals (Chen et al., 2007; Cohen et al., 2008; Cohen et al., 2010; Kim, 2019) while Zang (2012) in her study used the singed value (raw value) of accruals earnings management. The absolute value of accruals (AEM) captures the magnitude of the earnings management strategy and its reversals while signed or raw value of AEM named DA in this study allows the investigation of the direction of accruals (Cohen et al., 2008). Zhu et al. (2015) argues the use of the absolute value AEM might lead to biased results. Additionally, Mulford (1996) states that firms often use the big bath strategy, realizing large losses in a given year which losses were to be recognized in the future. The big bath strategy is used to report larger profits in the future. Accordingly, in order to keep the results comparable and relevant to the majority of the earnings management literature, this paper uses the absolute value of discretionary accruals which is AEM and also the signed (raw value) of discretionary accruals DA.

3.3.2 Real Earnings Management Measurement

Using the following models I generate normal level of the following three measures of REM, cashflow from operations, discretionary expenditures and production costs using the estimation model by Dechow et al. (1998) as implemented by Roychowdhury (2006). Subsequent studies (Cohen et al., 2008; Cohen et al., 2010; Khunkaew et al., 2019; Zang, 2012) uses the latter real earnings measurement proxies.

Subsequent studies (Cohen et al., 2008; Zang, 2012) provides evidence of the validity of the REM proxies as follows. Firms manipulate sales by offering higher price discounts and more lenient credit terms, although such discounts boost sales volume in the current period but increased in sales are more likely to disappear once the firms reverts to the old price. However, both price discounts and lenient credits terms will abnormally lower cashflow in the current period. Firms also lower cost of goods sold (COGS) by increasing production more than necessary which lower fixed costs per unit. Assuming no increase in marginal cost per unit, total cost per unit declines. This in turn decreases lower COGS allowing the firm to report higher earnings. However, the overproduction relative to sales will lead to higher production and holding costs resulting in abnormally higher annual production costs thus

lowering cashflow from operation given sales level. Lastly, firms take advantage of increased current period earnings by cutting down discretionary expenses that includes advertising expenses, research and development costs (R&D) and selling, general and administration expenses (SG&A). Firms report higher profits by reporting these expenses in the current period but not incurring them in the same period which also results in higher cashflow if the firms were to pay for such expenses in cash. Abnormally lower than normal expected discretionary expenses are proxied as REM through discretionary expenses.

Abnormal cashflow from operations (AB_CFO) is calculated as the difference between actual value minus normal level estimated by the following model:

$$\frac{CFO_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{S_t}{A_{i,t-1}} + \beta_3 \frac{\Delta S_t}{A_{i,t-1}} + \varepsilon_{it}$$

Production costs ($PROD_t$) is defined the sum of cost of goods sold ($COGS_t$) and change in inventory (ΔINV_t). Normal level of $COGS_t$ is modeled as linear function of contemporaneous sales as follows:

$$\frac{COGS_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{S_{it}}{A_{i,t-1}} + \varepsilon_{it}$$

Next, I model normal level of inventory growth (ΔINV_t) as follows:

$$\frac{\Delta INV_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{\Delta S_t}{A_{i,t-1}} + \beta_3 \frac{\Delta S_{i,t-1}}{A_{i,t-1}} + \varepsilon_{it}$$

Accordingly, since $PROD_t = \Delta COGS_t + \Delta INV_t$, normal level of production costs is defined as follows. Abnormal production costs (AB_PROD) are measured as the difference between actual value minus normal value estimated using the model below.

$$\frac{PROD_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{S_{it}}{A_{i,t-1}} + \beta_3 \frac{\Delta S_t}{A_{i,t-1}} + \beta_4 \frac{\Delta S_{i,t-1}}{A_{i,t-1}} + \varepsilon_{it}$$

The nature of treatment of cost of goods sold and change in inventory can be different across industries. For example, construction and distribution have trouble

engaging in earnings management through abnormal production costs. For instance, firms in the construction industry realize revenue, costs and inventors based on contracts in progress. Following Kim (2019), I capture the difference in earnings management through the means of over-production by manufacturing firms, I form a full sample of abnormal production proxy (AB_PROD1) and a subsample excluding non-manufacturing firms (AB_PROD2)

Abnormal discretionary expenditures (AB_DISEX) is calculated as the difference between actual value minus normal level estimated by the model below. Discretionary expenditure includes research and development expenses as well as selling, general and administration (SG&A) expenses. Using the convention followed by Attig et al. (2020) R&D expenses are set to 0 if these values are not available.

$$\frac{DISEX_{i,t}}{A_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{A_{i,t-1}} + \beta_2 \frac{S_{t-1}}{A_{i,t-1}} + \varepsilon_{it}$$

In the above equations CFO_t = Cashflow from operations in period t, S_t = Sales in period t, ΔS_t = Change in sales, ΔS_{t-1} = Change in sales from preceding year and A_{t-1} = Total assets at the end of year t-1. $PROD_t$ = Production costs in period t and $DISEX_t$ = Discretionary expenditure is period t.

Consistent with previous studies (Badertscher, 2011; Cohen et al., 2008; Cohen et al., 2010; Zang, 2012) to capture the effect of REM by the three individual measures I compute a proxy index REM_PROXY by taking sum of AB_PROD, AB_CFO and AB_DISEX. A higher value of the proxy indicates greater reported earnings by REM. AB_CFO and AB_DISEX are both multiplied by -1 as the higher the value it is more likely firms are managing reported earnings upward by sales manipulation and cutting down discretionary expenditures. AB_PROD is not multiplied by -1 as the higher the abnormal production cost the greater the increase in reported earnings through reducing cost of goods sold.

3.4 Descriptive Statistics of Earnings Management Measures

As discussed in detail in the Section 3.1 to estimate accruals earnings management model and proxies of real-earnings management measures, I start with 936 firms and firms in the financial services industry, property fund & property investment funds, firms delisted during the sample period and undergoing corporate restructuring, firms classified as state-owned enterprises are excluded from the sample and firms with incomplete/data errors are excluded from the sample. Additionally, due to the large number of incomplete/missing data in the Year 1993 and 1994 lead to mechanical error in estimating earnings management proxies. Although the Year 1993 is not part of the sample period stated earlier however variables such as lagged total assets, change in accounting receivables, change in sales and change in lagged sales requires observations from a year earlier. Thus, this has led to starting the analysis period from 1995 instead of 1994. The total number of firms included for estimating earnings management proxies is 553 firms resulting in 11,060 firm-year observations.

The equation for accruals earnings management and proxies of real earnings management are estimated cross-sectionally for each industry-year with at least 15 observations. Table 6 tabulates the descriptive statistics of earnings management variables for the entire sample including sub-sample of family firms and ownership concentration sample. Panel A tabulates descriptive statistics for the full sample period of the study from 1995-2014, while Panel B and C tabulates statistics of the sample period for regulatory events in 1999 and regulatory event in 2008 respectively. Earnings management proxy AEM is winsorized at 5% and 95% while DA and REM is winsorized at 1% and 99% to avoid extreme observations due to noisy estimation.

The sample mean (median) of AEM in the full sample in Table 6-Panel A is 0.0948 (0.0610) while for REM is 0.0017 (0.0101). In contrast the DA has a negative mean (median) of -0.0070 (-0.0055). I also include descriptive statistics of POSITVE_DA which is defined as the positive values of the variable DA and consecutively NEGATIVE_DA which is defined as the negative values of DA. This classification allows to determine whether DA is largely driven positive or negative accruals. I find that positive accruals (POSITIVE_DA) and negative accruals

(NEGATIVE_DA) on average have a similar magnitude for the full sample. Additionally, REM has a positive mean (median) value of 0.0017 (0.0101).

Table 6: Descriptive Statistics of Earnings Management Variables

	Obs.	Mean	Median	SD	25th Percentile	75th Percentile
Panel A: Full Sample (1995-2014)						
Earnings Management Variables						
AEM	6599	.0948	0.0610	.0956	.0268	.12464
REM	6250	.0017	0.0101	.3009	-.1519	.17273
DA	6599	-.0070	-0.0055	.1677	-.0654	.05571
POSTIVE_DA	3123	.10322	0.06003	.12442	.02668	.12869
NEGATIVE_DA	3476	-.10613	-0.06169	.1371	-.12158	-.02718
AB_CFO	6758	0	-0.0014	.1959	-.0721	.065
AB_DISEX	6720	0	0.0136	.1234	-.0354	.05406
AB_PROD1	6327	0	0.0034	.1892	-.0805	.08648
AB_PROD2	3751	0	0.0072	.1560	-.0711	.08528
Panel B: Sample of Regulatory Event in 1999 (1995-2003)						
Earnings Management Variables						
AEM	1980	0.0955	0.0628	.0947	.0283	.1245
REM	1778	.0014	0.0112	.2413	-.1245	.1450
DA	1980	-.0198	-0.0094	.1725	-.0746	.0522
POSTIVE_DA	915	.09432	0.05670	.11153	.02573	.11746
NEGATIVE_DA	1065	-.11801	-0.06847	.15438	-.12941	-.03005
AB_CFO	2019	0	0.0015	.1187	-.0618	.0577
AB_DISEX	1990	0	0.0134	.1185	-.0352	.0492
AB_PROD1	1826	0	0.0045	.1290	-.0601	.0680
AB_PROD2	1106	0	0.0051	.1183	-.0550	.0658
Panel C: Sample of Regulatory Event in 2008 (2003-2014)						
Earnings Management Variables						
AEM	4938	.0943	0.0600	.0957	.0262	.1243
REM	4758	.0020	0.0096	.3204	-.1643	.1884
DA	4938	-.0014	-0.0047	.1650	-.0623	.0574
POSTIVE_DA	2357	.1069	0.06130	.12993	.02702	.13202
NEGATIVE_DA	2581	-.10031	-0.05889	.1273	-.11697	-.02566
AB_CFO	5062	0	-0.0029	.2170	-.0758	.0686
AB_DISEX	5052	0	0.0144	.1300	-.0359	.0571
AB_PROD1	4791	0	0.0025	.2059	-.0904	.0942
AB_PROD2	2815	0	0.0086	.1675	-.0816	.093
Panel D: Ownership Classification Sample of Regulatory Event in 1999 (1995-2003)						
Earnings Management Variables						
AEM	1458	.0863	0.0566	.0869	.025	.1117
REM	1319	.0057	0.0100	.2367	-.1227	.1469
DA	1458	-.012	-0.0058	.1502	-.0635	.0521
POSITIVE AEM	691	.0862	0.0552	.0987	.0247	.1083
NEGATIVE AEM	767	-.1006	-0.0590	.1327	-.115	-.0254
AB CFO	1491	.0007	0.0010	.1147	-.0566	.0593
AB DISEX	1471	-.0036	-0.0159	.1016	-.0525	.0336
AB PROD1	1351	.0033	0.0048	.1262	-.0564	.069
AB PROD2	850	.004	0.0061	.1141	-.0498	.0653
Panel E: Ownership Classification Sample of Regulatory Event in 2008 (2003-2014)						
Earnings Management Variables						
AEM	3106	.0842	0.0534	.0882	.0233	.1102
REM	3087	-.0005	0.0053	.3105	-.1637	.1818
DA	3106	-.0034	-0.0048	.1461	-.0566	.0501
POSITIVE AEM	1478	.0917	0.0540	.1124	.0236	.1136
NEGATIVE AEM	1628	-.0896	-0.0527	.1166	-.1062	-.0229
AB CFO	3176	.004	0.0040	.1432	-.0632	.0716
AB DISEX	3152	-.005	-0.0147	.1102	-.0583	.0352
AB PROD1	3110	-.0027	0.0027	.1767	-.0874	.0887
AB PROD2	1853	.0024	0.0095	.1602	-.0775	.09

Continuation of Table 6: Descriptive Statistics of Earnings Management Variables

	Obs.	Mean	Median	SD	25th Percentile	75th Percentile
Panel F: Ownership Concentration Sample of Regulatory Event in 1999 (1995-2003)						
Earnings Management Variables						
AEM	1962	.09593	0.06320	.09497	.02842	.12491
REM	1760	.00235	0.01478	.2422	-.12145	.14685
DA	1962	-.01996	-0.00904	.17321	-.07471	.05231
POSITIVE_DA	910	.09447	0.05676	.11174	.02573	.11746
NEGATIVE_DA	1052	-.11895	-0.06938	.15504	-.13007	-.03071
AB_CFO	2001	.00065	0.00221	.11899	-.06079	.05873
AB_DISEX	1972	-.0002	0.01330	.11898	-.03562	.04918
AB_PROD1	1808	.00037	0.00544	.12953	-.06	.0687
AB_PROD2	1097	.00042	0.00575	.11872	-.05368	.06612
Panel G: Ownership Concentration Sample of Regulatory Event in 2008 (2003-2014)						
Earnings Management Variables						
AEM	4851	.09408	0.05978	.09541	.02621	.12406
REM	4690	.00344	0.01039	.31962	-.16385	.18949
DA	4851	-.00108	-0.00438	.16446	-.06197	.05765
POSITIVE_DA	2330	.1062	0.06065	.12891	.02692	.1305
NEGATIVE_DA	2521	-.10022	-0.05891	.12736	-.11654	-.02571
AB_CFO	4975	.00161	-0.00219	.21275	-.0757	.06913
AB_DISEX	4962	.0004	0.01447	.12924	-.03542	.05719
AB_PROD1	4723	.00039	0.00304	.20524	-.0901	.09477
AB_PROD2	2781	.00082	0.00922	.16718	-.08111	.0935

*Note: Variable definitions are in Table 7

Table 7: Variable Definitions of Earnings Management Proxies

Variables	Definitions
AEM	The absolute value of discretionary accrual, measured by Modified Jones Model
DA	Discretionary accruals (signed raw value) computed using Modified Jones Model
POSITIVE_DA	Value of positive discretionary accruals computed using Modified Jones Model
NEGATIVE_DA	Value of negative discretionary accruals computed using Modified Jones Model
AB_CFO	The level of abnormal cashflow from operations multiplied by (-1)
AB_DISEX	The level of abnormal discretionary expenditures multiplied by (-1)
AB_PROD1	The level of abnormal production costs computed using full industry sample where production cost is defined as the sum of cost of goods sold and change in inventory
AB_PROD2	The level of abnormal production costs computed excluding industries property & construction and services, production cost is defined as the sum of cost of goods sold and change in inventory
REM	Real earnings management, following Roychowdhury (2006) calculated by summing AB_CFO, AB_DISEX and AB_PROD1

The mean (median) of AEM in the sample period of regulatory event in 1999 and 2008 largely is unchanged of 0.0955 (0.0628) and 0.0943 (0.0600) respectively as tabulated in Panel B and C. This is not only true for the mean and median but also for the 25th and 75th percentile. Whereas DA in comparison to the mean (median) of -0.0198 (-0.0094) in regulatory event 1999 has a significantly smaller value of -0.0014 (-0.0047). The ownership classification sample for both the regulatory event has a

lower value of mean and median of AEM and DA while in comparison ownership concentration sample has values of the same magnitude of full sample of the regulatory events individually.

Negative accruals for the sample period of regulatory event in 1999 took a larger value than positive accruals, which is not only true for the mean but also for the 25th percentile. This is largely true for the sample of ownership classification and ownership concentration sample. However, for all samples in 2008 the mean of positive and negative accruals remains approximately about the same magnitude.

Mean and median values of REM is positive and a higher magnitude in regulatory event in 2008 compared to regulatory event in 1999 for the entire sample and the sub-sample of ownership concentration. The mean (median) of REM for the regulatory event in 1999 is 0.0014 (0.0112) while for the regulatory event in 2008 is 0.0020 (0.0096). However, both mean (median) took notably lower value of -.0005 (0.0053) for the ownership classification sample during the regulatory event in 2008, compared to .0057 (0.0053) during the regulatory event in 1999.

REM proxies AB_CFO, AB_DISEX, AB_PROD1 and industry sub-sample AB_PROD2 has mean close to zero which is mechanical as these measures are predicted from the residuals of the regressions.

Figures 3 and 4 graphically represent the trends of earning management strategies over the full sample period of 1995-2014. In 1999 during the first regulatory event, AEM decreased while REM increased, which could be explained by the effect of the SET mandating audit committee independence thus resulting in greater transparency in financial auditing and reporting. Accordingly, in the year 2003 AEM fell sharply while REM increased after SEC formally recognized audit committee independence. This shows with increased vigilance and scrutiny by independent audit committee members, firms substituted to REM from AEM as the management of earnings through REM is harder to detect.

Both AEM and REM show significant decline right after the SEC's rigorous mandate on board independence in 2008 implying independent board directors held greater role in downward degree of earnings management through higher checks and balances. However, after 2010 which acted as the mandatory enforcement year for Thai firms to implement mandated ratio of independent directors on board, AEM shows a declining trend while REM increased significantly suggesting a substitution effect between AEM and REM. Additionally, post-regulatory event in 2008 (after mandatory enforcement year 2010) time trends suggest Thai firms substituted between AEM and REM as when one strategy decreased another increased.

Figure 3: Absolute Accrual Earnings Management Over Period of 1995-2014

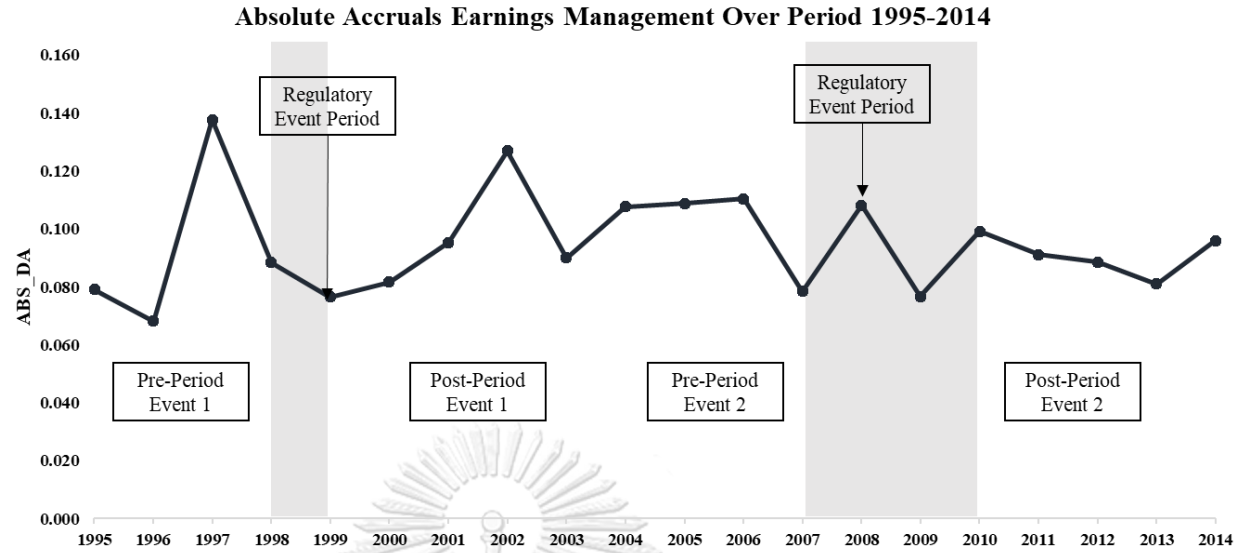
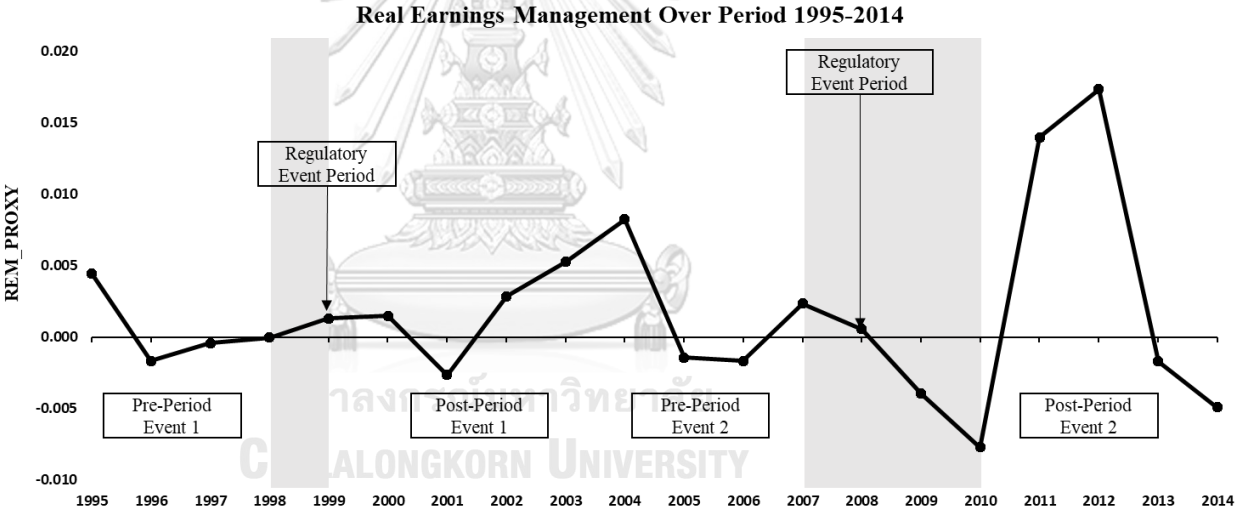


Figure 4: Real Earnings Management Over Period of 1995-2014



3.5 Firm Groups

I analyze the magnitude of AEM, DA and REM for three mutually exclusive groups of firms: firms that were *Always in* compliance and firms that *Got into compliance* and *Other* (hereinafter AIC, GIC and Others) (Dahya et al., 2007; Prachyangprecha, 2013).

I define the groups as follows: AIC group is defined as firms that met the criteria of having three or more independent directors on board throughout the sample period (1995-2003) of the regulatory event in 1999 and having one-third of the board

being independent for the sample period (2003-2014) for the regulatory event in 2008; GIC is defined as firms that had three or more independent directors in the post-period (1999-2003) for the regulatory event in 1999 and one-third of the board being independent in the post period (2010-2014) for the regulatory event in 2008[4]; Others group is defined as firms that went in and out of compliance (implying these firms were inconsistent in maintaining the minimum level of independent directors in their boards in post-period of both regulatory event in 1999 and 2010) and firms that were never complied with the regulatory requirement for level of independent directors.

During the regulatory event in 1999, AIC group includes 25 firms, GIC includes 213 firms, Others group includes 247 firms, and 68 firms were dropped due to inconsistency in data[5]. In the sample size for regulatory event in 2008, AIC group includes 110 firms, GIC includes 250 firms, Others group includes 192 firms and 1 firm was dropped due to inconsistency in data.

Applying Welch t-test, I test the difference in means of earnings management proxies AEM, DA and REM within periods against each mutually exclusive groups AIC, GIC and Others. The tests are conducted in the similar manner for both the regulatory event in 1999 and in 2008.

First, I use Welch's t-test to test between sample of means with the assumption of non-equal variance. I apply the test statistics for each pair of earnings management proxies between groups for pre-period, post-period and transition period as demonstrated in Table 8,9,10,11,12 and 13. For example, for pre-period I calculate mean proxies of AEM, DA and REM for AIC followed by the same for transition period and post-period. I repeat the same methodology for GIC and Others group.

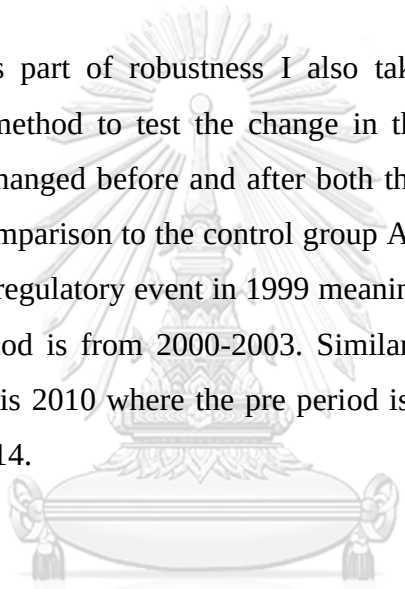
Secondly, I apply t-test to test the significance in means for each pair of groups. For instance, mean AEM of AIC against mean AEM of GIC; mean AEM of AIC against mean AEM of Others group. I repeat the following methodology to test the significance of means for each mutually exclusive group against the other for each

[4] This group do not include firms that are in the AIC group
[5] The board data which included number of independent directors were missing or had data lag in some of the years of the sample period for both regulatory event in 1999 and 2008

earnings management proxies. Accordingly for the crossover period, the difference in means of the earnings management proxies for the pre-period against the post-period is applied i.e. the mean of AEM of AIC for pre-period against the mean of the same in the post-period.

The analysis of observing the difference in means of earnings management measures for the groups AIC, GIC and Others during the pre, transition and post periods allows to observe how the level of AEM and REM differs among firms in these groups in each periods that came into compliance with the regulatory events.

Additionally, as part of robustness I also take advantage of difference in difference estimation method to test the change in the difference in means of the treatment group GIC changed before and after both the regulatory regime change in 1999 and 2008 with comparison to the control group AIC. In this part of analysis, the cutoff year is 1999 for regulatory event in 1999 meaning the pre-period is from 1995-1999 and the post period is from 2000-2003. Similarly for the regulatory event in 2008 the cutoff period is 2010 where the pre period is from 2003-2010 and the post period is from 2011-2014.



3.5.1 Analysis and Results

Table 8: Descriptive Statistics and Difference in Means of Pre-Period (1995-1997) of Regulatory Event in 1999 for Firm Groupings AIC, GIC and Others

		(A) AIC	(B) GIC	(C) Others	Difference (A-B)	Difference (A-C)	Difference (B-C)
AEM	Mean	0.104	0.091	0.111	0.014	-0.007	-0.021***
	SD	0.092	0.083	0.096	(0.303)	(0.652)	(0.052)
	N	56	347	101			
DA	Mean	-0.047	-0.002	0.003	-0.045**	-0.050**	-0.005
	SD	0.140	0.128	0.150	(0.027)	(0.038)	(0.752)
	N	56	347	101	2.7%		
REM	Mean	-0.059	-0.010	0.079	-0.049	-0.138***	-0.089***
	SD	0.284	0.207	0.204	(0.231)	(0.003)	(0.000)
	N	54	322	88	23.1%		

***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Based on Table 8, GIC vs Others has a higher difference in means for AEM with p-value significance level at 1% for pre-period of regulatory event in 1999 which suggests Others group manipulated earnings through AEM at higher degree than GIC group. In terms of DA, both AIC vs GIC and AIC vs Others is significant at 5% where both GIC and Others group had higher degree of manipulation through DA than AIC. Difference in means comparison between groups for REM shows Others group level of REM manipulation higher than both AIC and GIC with significance level at 1%.

Table 9: Descriptive Statistics and Difference in Means of Pre-Period (2003-2006) of Regulatory Event in 2008 for Firm Groupings AIC, GIC and Others

		(A) AIC	(B) GIC	(C) Others	Difference (A-B)	Difference (A-C)	Difference (B-C)
AEM	Mean	0.099	0.106	0.110	-0.008	-0.011	-0.003
	SD	0.101	0.107	0.112	0.239	0.188	0.659
	N	384	777	300	23.9%		
DA	Mean	0.016	-0.003	-0.005	0.019	0.021	0.002
	SD	0.186	0.202	0.219	0.114	0.184	0.885
	N	384	777	300	11.4%		
REM	Mean	0.036	-0.021	0.014	0.057***	0.022	-0.035
	SD	0.276	0.313	0.298	0.002	0.343	0.105
	N	373	693	271	0.2%		

Table 9 shows the difference in means comparison for pre-period of the regulatory event in 2008. During the pre-period for the regulatory event in 2008, difference in means between AIC vs GIC is significant for REM at 1% level with AIC manipulating earnings through REM at a higher degree than GIC.

Table 10: Descriptive Statistics and Difference in Means of Transition Period (1998-1999) of Regulatory Event in 1999 for Firm Groupings AIC, GIC and Others

		(A) AIC	(B) GIC	(C) Others	Difference (A-B)	Difference (A-C)	Difference (B-C)
AEM	Mean	0.083	0.076	0.115	0.007	-0.032*	-0.039***
	SD	0.071	0.068	0.097	(0.550)	(0.066)	(0.004)
	N	38	285	60	55.0%		
DA	Mean	-0.011	-0.015	-0.038	0.004	0.027	0.023
	SD	0.110	0.106	0.181	(0.836)	(0.354)	(0.336)
	N	38	285	60	83.6%		
REM	Mean	-0.043	-0.004	0.054	-0.038	-0.097**	-0.058**
	SD	0.209	0.196	0.174	(0.300)	(0.022)	(0.026)
	N	37	270	58	30.0%		

During the transition period of the regulatory event in 1999 the difference in means between groups GIC and Others is significant at 1% (as shown in table 10) with Others employing higher level of earnings management through AEM compared at GIC. In terms of REM, AIC vs Other and GIC vs Other mean comparison is significant at 5% meaning Others group manipulated earnings through REM at higher level than AIC and GIC.

Table 11: Descriptive Statistics and Difference in Means of Transition Period (2007-2010) of Regulatory Event in 2008 for Firm Groupings AIC, GIC and Others

		(A) AIC	(B) GIC	(C) Others	Difference (A-B)	Difference (A-C)	Difference (B-C)
AEM	Mean	0.079	0.093	0.094	-0.014***	-0.015**	-0.001
	SD	0.082	0.094	0.095	0.008	0.027	0.852
	N	371	886	308	0.8%		
DA	Mean	0.003	-0.010	-0.024	0.014	0.028**	0.014
	SD	0.129	0.161	0.162	0.116	0.016	0.191
	N	371	886	308	11.6%		
REM	Mean	0.035	-0.014	-0.003	0.048**	0.038	-0.010
	SD	0.295	0.329	0.334	0.012	0.129	0.649
	N	369	874	292	1.2%		

During the transition period in regulatory event in 2008 as shown in Table 11, mean difference between AIC and GIC and AIC and Others for AEM is significant at 1% and 5% significantly. This means GIC and Others had a higher level of earnings management through AEM than AIC. In terms of DA and REM AIC managed earnings higher than Others and GIC respectively with significance level at 5% for both group comparison.

Table 12: Descriptive Statistics and Difference in Means of Post Period (2000-2003) of Regulatory Event in 1999 for Firm Groupings AIC, GIC and Ohers Firm Groupings

		(A) AIC	(B) GIC	(C) Others	Difference (A-B)	Difference (A-C)	Difference (B-C)
AEM	Mean	0.083	0.091	0.136	-0.008	-0.053***	-0.045***
	SD	0.093	0.094	0.127	(0.472)	(0.000)	(0.000)
	N	87	747	236			
DA	Mean	-0.006	-0.030	-0.024	0.024	0.019	-0.005
	SD	0.162	0.175	0.279	(0.199)	(0.461)	(0.781)
	N	87	747	236			
REM	Mean	-0.036	-0.001	0.040	-0.035	-0.076**	-0.040*
	SD	0.257	0.268	0.269	(0.240)	(0.032)	(0.084)
	N	84	680	167			

Table 12 shows difference in means comparison between groups for post-regulatory event in 1999. Mean difference comparison between both AIC vs Others and GIC vs Others for AEM is significant at 1% with Others managed earnings at higher degree than AIC and GIC. In terms of REM, AIC vs Others is significant at 5% with Others managed earnings at a higher degree than AIC.

Table 13: Descriptive Statistics and Difference in Means of Post Period (2011-2014) of Regulatory Event in 2008 for Firm Groupings AIC, GIC and Others

		(A) AIC	(B) GIC	(C) Others	Difference (A-B)	Difference (A-C)	Difference (B-C)
AEM	Mean	0.083	0.082	0.091	0.001	-0.008	-0.009
	SD	0.085	0.082	0.089	0.847	0.230	0.109
	N	350	852	335			
DA	Mean	0.024	-0.007	-0.009	0.031***	0.033***	0.002
	SD	0.133	0.126	0.136	0.000	0.002	0.827
	N	350	852	335			
REM	Mean	0.082	0.012	-0.029	0.071***	0.111***	0.040
	SD	0.270	0.318	0.363	0.000	0.000	0.076
	N	363	882	332			

During the post-period of the regulatory event in 2008, both mean difference between AIC vs GIC and AIC vs Others is significant at 1% for DA and REM. These results suggest AIC group managed earnings through DA and REM at higher degree than GIC and Others.

Table 14: Descriptive Statistics and Cross-Over Difference in Means of Regulatory Event in 1999 for Firm Groupings AIC, GIC and Others

		(A) Pre-AIC	(B) Pre-GIC	(C) Pre-Others	(D) Post-AIC	(E) Post-GIC	(F) Post-Others	Difference (A-D)	Difference (B-E)	Difference (C-F)
AEM	Mean	0.104	0.091	0.111	0.083	0.091	0.131	0.021	0.000	-0.020*
	SD	0.092	0.083	0.096	0.093	0.094	0.122	(0.178)	(0.960)	(0.096)
	N	56	347	101	87	747	296			
DA	Mean	-0.047	-0.002	0.003	-0.006	-0.030	-0.027	-0.041	0.027***	0.030
	SD	0.140	0.128	0.150	0.162	0.175	0.262	(0.107)	(0.004)	(0.159)
	N	56	347	101	87	747	296			
REM	Mean	-0.059	-0.010	0.079	-0.036	-0.001	0.043	-0.023	-0.009	0.036
	SD	0.284	0.207	0.204	0.257	0.268	0.248	(0.636)	(0.551)	(0.192)
	N	54	322	88	84	680	225			

Table 14 shows the mean difference between groups during pre and post period. The mean difference between Pre-GIC vs Post-GIC is significant at the 1% level and the results suggest firms in the GIC groups managed earnings higher through DA during the pre-period. The results complement that pre-regulatory regime change GIC firms manipulated earnings through accruals and the level of manipulation through accruals decreased post-regulatory period given greater scrutiny of financial statements in the presence of higher the right number of audit committee members as set by the regulatory board.

Table 15: Descriptive Statistics and Cross-Over Difference in Means of Regulatory Event in 2008 for Firm Groupings AIC, GIC and Ohers

		(A) Pre-AIC	(B) Pre-GIC	(C) Pre-Others	(D) Post-AIC	(E) Post-GIC	(F) Post-Others	Difference (A-D)	Difference (B-E)	Difference (C-F)
AEM	Mean	0.099	0.106	0.110	0.083	0.082	0.091	0.015**	0.024***	0.018**
	SD	0.101	0.107	0.112	0.085	0.082	0.089	0.027	0.000	0.025
	N	384	777	300	350	852	335			
DA	Mean	0.016	0.003	-0.005	0.024	0.007	-0.009	-0.008	0.004	0.003
	SD	0.186	0.202	0.219	0.133	0.126	0.136	0.482	0.666	0.816
	N	384	777	300	350	852	335			
REM	Mean	0.036	0.021	0.014	0.082	0.012	-0.029	-0.046**	-0.033	0.043
	SD	0.276	0.313	0.298	0.270	0.318	0.363	0.022	0.042	0.112
	N	373	693	271	363	882	332			

Table 15 shows the mean difference between groups during the pre and post period for regulatory event in 2008. The difference in means for pre-post AIC, GIC and Others is significant at 5%, 1% and 5% level respectively. The results suggest firms in AIC, GIC and Others group had higher degree of earnings management through AEM during the pre-period which is as hypothesized. The difference in means between pre and post period for REM measure is significant at 5%, suggesting firms in AIC group managed earnings at a higher degree through REM in post-period.

The decline in AEM and higher degree of REM in the post-period suggests that in the presence of higher number of independent directors firms substituted to REM given the strategy is hard to detect.

Table 16: Descriptive Statistics and Difference in Difference Estimation of Regulatory Event in 1999 for Firm Groupings AIC and GIC

VARIABLES	(1) AEM	(2) DA	(3) REM	(4) POSITIVE_DA	(5) NEGATIVE_DA
Diff-in-diff	-0.0194	0.0485**	0.00944	0.0112	0.0474
	(0.0137)	(0.0239)	(0.0390)	(0.0221)	(0.0288)
Observations	1,560	1,560	1,447	711	849
R-squared	0.002	0.005	0.003	0.001	0.013
Mean AIC (Pre-Period)	0.0841	-0.00771	-0.00734	0.0820	-0.0883
Mean GIC (Post-Period)	0.0958	-0.0323	-0.0521	0.0804	-0.109
Difference (GIC-AIC)	0.0118	-0.0246	-0.0448	-0.00156	-0.0206
Mean AIC (Post-Period)	0.0906	-0.0295	-0.000678	0.0837	-0.121
Mean GIC (Post-Period)	0.0830	-0.00555	-0.0360	0.0933	-0.0936
Difference (GIC-AIC)	-0.00763	0.0240	-0.0353	0.00961	0.0269

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 17: Descriptive Statistics and Difference in Difference Estimation of Regulatory Event in 2008 for Firm Groupings AIC and GIC

VARIABLES	(1) AEM	(2) DA	(3) REM	(4) POSITIVE_DA	(5) NEGATIVE_DA
Diff-in-diff	0.0113	0.0143	0.0184	0.0229*	-0.00723
	(0.00720)	(0.0124)	(0.0237)	(0.0134)	(0.0141)
Observations	3,620	3,620	3,554	1,745	1,875
R-squared	0.006	0.004	0.010	0.013	0.010
Mean AIC (Pre-Period)	0.0993	-0.00699	-0.0167	0.115	-0.110
Mean GIC (Post-Period)	0.0890	0.00962	0.0354	0.110	-0.0868
Difference (GIC-AIC)	-0.0103	0.0166	0.0521	-0.00436	0.0230
Mean AIC (Post-Period)	0.0824	-0.00673	0.0117	0.0797	-0.0892
Mean GIC (Post-Period)	0.0834	0.0242	0.0822	0.0983	-0.0734
Difference (GIC-AIC)	0.00103	0.0309	0.0705	0.0186	0.0157

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 16 and 17 tabulates the estimation results of the difference in difference method on the treatment group GIC and the control group AIC for regulatory event in 1999 and 2008 respectively. The difference in difference DA as shown in Table 16 is positive and significant at 5% for the regulatory event in 1999 which the regulatory event itself had a higher positive effect on accruals earnings management. In contrary,

the difference in difference on the earnings management proxies as shown in Table 17 for regulatory event in 2008 are not significant, however positive DA show weak significant at 10% with a positive value which indicates the regulatory regime change lead to higher positive discretionary accruals.

3.4 Empirical Models

3.4.1 Regression Model for Association of AEM and REM and Regime Change

I regress Equation (1) below to test hypothesis 1a and hypothesis 1b. Similarly, equation (2) is used to test hypothesis 2a and hypothesis 2b. The following equations are used to determine the level of AEM and REM pre and post reform period of both regulatory events in 1999 and in 2008.

$$AEM_{i,t} = \beta_0 + \beta_1 POST\_REG_{i,t} + \beta_2 INBD_{i,t} + \beta_3 ROA_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 MTB_{i,t} + \beta_6 LEV_{i,t} + \beta_7 LOSS_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$REM_{i,t} = \beta_0 + \beta_1 POST\_REG_t + \beta_2 INBD_{i,t} + \beta_3 ROA_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 MTB_{i,t} + \beta_6 LEV_{i,t} + \beta_7 LOSS_{i,t} + \varepsilon_{i,t} \quad (2)$$

where for firm *i* and year *t*; *AEM* is the absolute value of discretionary accruals estimated by modified cross-sectional Jones model Jones (1991); *REM* is result of REM_PROXY index which is the summation of AB_PROD, AB_CFO and AB_DISEX; POST_REG is a dummy variable which is set to 1 if the observation is from the post regulation period and otherwise 0; INBD is the number of independent directors divided by total board size.

In the above equations the variable of interest is POST_REG for both equation (1) and (2) which captures the effect of regulatory regime change on the level of AEM and REM. Accordingly I predict to see a negative relation between both the earnings management strategies and post reform periods with a negative coefficient sign.

Following (Cohen et al., 2008; Cohen et al., 2010; Zang, 2012) I include the following control variables. ROA is used to control for measurement error related to firm performance and is calculated as the ratio of income before extraordinary items

to total asset. Firm size (SIZE) is the control for firm size effect which is calculated as the logarithm of total asset. I control for growth (MTB) calculated as the ratio of market value of equity to book value of equity. Previous research suggests firms with high leverage faces higher risk of default thus are likely to manage earnings to avoid bankruptcy, I control for financial distress (LEV) measured as the total liabilities divided by total assets. Additionally, I use dummy variable (LOSS) which take the value of 1 if firm recorded net income less than zero at year t.

High-quality auditors can constrain earnings management and it is important to control for auditors particularly Big four constraining earning management. However, due to data available in Datastream database and other online sources are static rather than time-series which constrained the collection of such data.

3.4.2 Regression Model for Association between Earnings Substitution and Regime Change

Firms adjust AEM end of the fiscal year based on the realized outcome of the REM during the fiscal year (Francis et al., 2016; Zang, 2012). This implies that both REM and AEM occurs in sequential order thereby managers make decision on REM first and adjust AEM accordingly based on the level of earnings target already realized using REM. Additionally Zang (2012) provided evidence that firms switch between the two strategies based on the relative costliness of each. The degree of low/high cost associated with both AEM and REM provides firms with incentives to increase/reduce between the two alternative strategies (Sarra et al. (2019). Thus, this results in a joint decision in managing earnings using REM and AEM. Accordingly, it could be argued that AEM is endogenous in REM equation and REM is endogenous in AEM equation.

In the presence of endogeneity, the ordinary least squares (OLS) become inconsistent and biased and in such case estimation of simultaneous equation using two-stage least squares 2SLS yields unbiased estimates. Researchers including (Barton, 2001; Chen et al., 2012; Sarra et al., 2019; Zang, 2012) discovered this endogenous relationship between the two alternative strategies AEM and REM. They

addressed this issue using simultaneous equations modeled by 2SLS where the endogenous variables are AEM and REM which I also follow in this study.

The solution to endogeneity using (2SLS) relies upon using instrumental variables (IV) for each endogenous variable in the system which allows to determine predicted value of the independent variables. However, Badertscher (2011) explains in accounting research setting these instrumental variables are difficult to identify. Despite the potential concern instrumental variables are required to estimate the simultaneous equations defined below. Accordingly, I follow previous studies to control for endogeneity in the following manner.

Sarra et al. (2019) in their study argue that since managers uses various strategies to manage earnings leads to several exogenous variables to be correlated with decision to manage earrings. Consistent with Cohen & Zarowin, (2010), Chen et al., (2012) and Zang (2012) the common exogenous variables that I include in AEM and REM equaitons are as follows: firm size (SIZE), firm performance (ROA), firm growth (MTB), firm leverage (LEV), firm accounting flexibility (NOA). The exclusive variable that is included in the REM equation is C_PROD which represents the firm's production capacity. And the exclusive variable included in the AEM equation is the lagged AEM. I explain more about the methodology of these variables later in the study. Chen et al. (2012) and Das et al. (2017) in their studies use C_PROD as instrumental variable in the REM equation and lagged AEM and high quality auditor proxy BIG4 as instrumental variable in the AEM equation. They further argue that since C_PROD is in the REM equation only and lagged AEM and BIG4 is in the AEM equation only, these exclusive variables can be taken as instrumental variables and accordingly the simultaneous equations can be identified since the variables differs in the REM and AEM equation. Following their study, I use C_PROD as instrumental variable in the REM equation and in the AEM lagged AEM is taken as instrumental variable. However, as discussed earlier in the study I exclude the variable BIG4 (dummy variable if high quality auditor is appointed) due to data permissibility. Additionally, I use instrumental variable lagged POST_REG* $AEM_{i,t-1}$ for the interaction terms POST_REG*$AEM_{i,t-1}$. In the AEM equation I use

instrumental variable POST_REG*C_PROD$_{i,t}$ for the interaction term POST_REG*REM.

I use the following simultaneous equations to test hypothesis 3a and 3b investigating the substitution between AEM and REM post regulatory reform in 1999 and in 2008.

$$REM_{i,t} = \beta_0 + \beta_1 AEM_{i,t} + \beta_2 POST\_REG_{i,t} + \beta_3 INBD_{i,t} + \beta_4 POST\_REG_{i,t} * AEM_{i,t} + \beta_5 ROA_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 LEV_{i,t} + \beta_9 NOA_{i,t} + \beta_{10} Dummy_{INDUS_i} + \beta_{11} Dummy_{YEAR,t} + \varepsilon_{i,t} \quad (3)$$

$$AEM_{i,t} = \beta_0 + \beta_1 REM_{i,t} + \beta_2 POST\_REG_{i,t} + \beta_3 INBD_{i,t} + \beta_4 POST\_REG_{i,t} * REM_{i,t} + \beta_5 ROA_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 MTB_{i,t} + \beta_8 LEV_{i,t} + \beta_9 NOA_{i,t} + \beta_{10} Dummy_{INDUS_i} + \beta_{11} Dummy_{YEAR\ t} + \varepsilon_{i,t} \quad (4)$$

Following (Chen et al., 2012; Zang, 2012) in the first stage I regress AEM and REM on the exogenous variables and instrumental variables to obtain predicted value of the endogenous variables. In the second stage the predicted values are used instead of the actual values to estimate the simultaneous equations.

The variable of interest in the REM equation is AEM and in the AEM equation the variable of interest is REM with an expected negative sign that reflects substitution between the two strategies. Additionally, interaction term POST_REG * AEM and POST_REG * REM are also considered as variable of interest that accounts for the effect of regulatory change on the substitution between the two strategies. Also, POST_REG in the above equations of AEM and REM reflects the level of the two earnings management strategies post regulatory event.

Following (Chen et al., 2012; Cohen et al., 2010; Zang, 2012), I use the following exogenous variables. However, here I only explain methodologies of the variables not mentioned earlier in the study. The common variable in both REM and AEM equations includes firm's size (SIZE), firm's performance (ROA), firm's growth (MTB), firm's leverage (LEV) and firm's accounting flexibility (NOA) measured by net operating assets (shareholder's equity plus total debt less cash and marketable securities at the beginning of the year) at the beginning of the year t scaled by lagged sales. Barton et al. (2002) argues that NOA reflects the level of previous

earnings management since the balance sheet accumulates the effect of prior accounting choices to some extent. He further states the higher the NOA the lower the flexibility of managers to undertake AEM thus they substitute to REM. The exclusive variables in the AEM equation is lagged $AEM_{i,t-1}$ taking the absolute value of AEM in the year t-1. Lagged $AEM_{i,t-1}$ is used as firms which use AEM to manipulate earnings in one period needs to manipulate again in the subsequent period due to the reversing nature of AEM in order for the firm to achieve the same level of AEM . (Chen et al., 2012; Khunkaew et al., 2019) states the larger the capacity of the firm the lower the REM. Following their study the exclusive variable in the REM equation is the firm's production capacity ($C\_PROD_{i,t}$) at year t estimated by property, plant and equipment (PPE) divided by current sale.

3.4.3 Regression Model for Association and Substitution of AEM and REM between Family Firms

I use the following regression equations to test the level of AEM and REM pre and post reform period in family firms. The AEM equation below is used to test hypothesis 4a and 4b and the REM equation below is used to test hypothesis 5a and 5b.

$$\begin{aligned} AEM_{i,t} = {} & \beta_0 + \beta_1 POST\_REG_{i,t} + \beta_2 INBD_{i,t} + \beta_3 FAM\_OWN_{i,t} \\ & + \beta_4 POST\_REG_{i,t} * FAM_{OWN_{i,t}} + \beta_5 ROA_{i,t} + \beta_6 SIZE_{i,t} \\ & + \beta_7 MTB_{i,t} + \beta_8 LEV_{i,t} + \beta_9 LOSS_{i,t} \\ & + \varepsilon_{i,t} \end{aligned} \quad (5)$$

$$\begin{aligned} REM_{i,t} = {} & \beta_0 + \beta_1 POST\_REG_{i,t} + \beta_2 INBD_{i,t} + \beta_3 FAM\_OWN_{i,t} \\ & + \beta_4 POST\_REG_{i,t} * FAM_{OWN_{i,t}} + \beta_5 ROA_{i,t} + \beta_6 SIZE_{i,t} \\ & + \beta_7 MTB_{i,t} + \beta_8 LEV_{i,t} + \beta_9 LOSS_{i,t} \\ & + \varepsilon_{i,t} \end{aligned} \quad (6)$$

where FAM_OWN is dummy variable which takes the value 1 if the observation is a family firm otherwise 0. In the actual regression analysis using the ownership classification sample, the FAM_OWN variable is replaced with FAM_C25 for family ownership threshold at 25% and FAM_C10 for family ownership threshold at 10%. Similarly, for the robustness tests using ownership concentration sample,

OWN_T5 for top five ownership concentration level and OWN_T10 is used for top ten ownership concentration level.

In the above equations the variable of interest is POST_REG which in AEM equation reflects the level of AEM post regulatory reform and the same variable in REM equation reflects the level of REM post regulatory reform. I expect to see a negative relation between POST_REG and the two earnings management strategies. The interaction term POST_REG * FAM_OWN additionally accounts for the effect of regulatory reform on earnings management strategies in family firms. Additionally, the variable FAM_OWN also shows the level of AEM or REM of family firms both pre and post regulatory reform.

In order to test hypothesis 6a and 6b which investigates the substitution between AEM and REM of family firms I regress the following simultaneous equations. Here I also employ the same methodology to estimate the simultaneous equations discussed earlier in the study. Additionally, I use instrumental variable lagged $AEM_{i,t-1}$*POST_REG for the interaction terms AEM*POST_REG and lagged $AEM_{i,t-1}$*FAM_OWN for the interaction term AME*FAM_OWN in the REM equation since the endogenous variable AEM is interacted with the POST*REG and FAM_OWN variable. In the AEM equation I use instrumental variable $C\_PROD_{i,t}$*POST_REG for the interaction term REM*POST_REG and $C\_PROD_{i,t}$*FAM_OWN for the interaction term REM*FAM_OWN since the endogenous variable REM is interacted with POST_REG and FAM_OWN variable.

$$REM_{i,t} = \beta_0 + \beta_1 AEM_{i,t} + \beta_2 POST\_REG_{i,t} + \beta_3 INBD_{i,t} + \beta_4 FAM\_OWN_{i,t} + \beta_5 AEM_{i,t} * POST_{REG\,i,t} + \beta_6 AEM_{i,t} * FAM_{OWN\,i,t} + \beta_7 ROA_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 MTB_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} NOA_{i,t} + \beta_{12} C_{PROD\,i,t} + \beta_{13} Dummy_{INDUS_i} + \beta_{14} Dummy_{YEAR_{,t}} + \varepsilon_{i,t} \quad (7)$$

$$AEM_{i,t} = \beta_0 + \beta_1 REM_{i,t} + \beta_2 POST\_REG_{i,t} + \beta_3 INBD_{i,t} + \beta_4 FAM\_OWN_{i,t} + \beta_5 REM_{i,t} * POST_{REG\,i,t} + \beta_6 REM_{i,t} * FAM_{OWN\,i,t} + \beta_7 ROA_{i,t} + \beta_8 SIZE_{i,t} + \beta_9 MTB_{i,t} + \beta_{10} LEV_{i,t} + \beta_{11} NOA_{i,t} + \beta_{12} AEM_{i,t-1} + \beta_{13} Dummy_{INDUS_i} + \beta_{14} Dummy_{YEAR\ \ t} + \varepsilon_{i,t} \quad (8)$$

In the above simultaneous equations, the variable of interest is the AEM in the REM equation and REM in the AEM equation with an expected negative sign which shows substitution between the two strategies in family firms. Additionally, the variables POST_ REG and FAM_OWN account for the level of REM or AEM both pre and post regulatory reform. The interaction term AEM * POST_REG reflects the substitution between REM and AEM post regulatory reform. Similarly, the second interaction term AEM * FAM_OWN takes account of the substitution between the two earnings management strategies in family firms.

Chapter 4: Tests and Empirical Results

4.1 Descriptive Statistics of Independent Variables

Missing values in the number of observations for the independent variables are dropped. I start a large number of observations in constructing the AEM and REM proxies after which the missing observation for respective independent variables are dropped which gives a true reflection of the actual number of observations used in the subsequent regression analysis.

The full sample in Table 18 (Panel A) shows firms have on average 23.97 % independent directors while independent directors increased to 24.1% for the sample period of regulatory event in 1999 and dropped marginally to 23.86% for the sample period of regulatory event in 2008. The ratio of independent directors largely remained stable for family firm's sample (ownership classification categories and ownership concentration) during the regulatory event in 1999 while similar to the non-family firms sample dropped marginally for the sample period of regulatory event in 2008. Firms in the full sample show market-to-book ratio of 1.5219. The mean value of the NOA is 1.4257. Average leverage is at 48.27% with a median value close to the mean.

In family firm's sub-sample of ownership concentration, I find that for sample of regulatory event in 1999 the top five shareholders (TOP_FIVE) on average holds 58.10% of outstanding shares and the top ten shareholders (TOP_TEN) on average holds 70.02%. The median of the top five and ten shareholders is at 58.31% and 71.60% respectively. The mean (median) shareholdings of top five and ten shareholders for the sample of the regulatory event in 2008 is 57.64% (57.55%) and 68.43% (70.29%) respectively which shows shareholdings of major shareholders remained largely same over the both the regulatory period sample.

Table 20 tabulates Pearson correlation among the variables of interest. The correlation between AEM and REM is significantly positive at 1% level, however the correlation is not strong. The three earnings management strategies of REM are significant and positive at 1% level with REM, which suggests that firms use all three

earnings management proxies to manage earnings through REM. Both AEM and REM are negatively correlated with ROA. SIZE is negatively correlated with AEM but positively correlated with REM. LEV and NOA have a positive correlation with both earnings management strategies. MTB is positively correlated with AEM while is negatively correlated with REM. Variable inflation factors (VIF) of the independent variables (not tabulated) are between 1 and 2 which suggests regression models do not have severe multi-collinearity problems.

Table 18: Descriptive Statistics of Independent Variables

	Obs.	Mean	Median	SD	25th Percentile	75th Percentile
Panel A: Full Sample (1995-2014)						
Independent Variables						
INBD	3946	.3295	0.3333	.0992	.2667	.3846
LOG_BDSIZE	3946	2.3952	2.3979	.2656	2.1972	2.5649
ROA	3946	.042	0.0501	.0984	.0082	.0905
SIZE	3946	15.1966	14.9968	1.4421	14.0988	16.1249
MTB	3946	1.4711	1.0509	1.1863	.6303	1.8877
LEV	3946	.4407	0.4489	.2273	.2553	.6095
NOA	3946	1.3938	0.8589	1.4251	.5314	1.5736
AEMt-1	3946	.0847	0.0546	.0879	.0242	.1097
DAt-1	3946	-.0023	-0.0038	.1511	-.0572	.0517
C_PROD	3946	1.3015	0.9189	1.2283	.4463	1.665
Panel B: Sample of Regulatory Event in 1999 (1995-2003)						
Independent Variables						
INBD	1315	.2732	0.2667	.0983	.2000	.3333
LOG_BDSIZE	1315	2.4454	2.4849	.2786	2.3026	2.6391
ROA	1315	.0269	0.0424	.1067	-.0074	.0832
SIZE	1315	15.038	14.8456	1.369	14.0074	15.8617
MTB	1315	1.2123	0.8450	1.0574	.4878	1.5344
LEV	1315	.5038	0.5168	.2412	.3204	.6796
NOA	1315	1.5799	0.9964	1.5109	.6211	1.8439
AEMt-1	1315	.087	0.0592	.0855	.0273	.1129
DAt-1	1315	-.0103	-0.0036	.1513	-.0649	.0552
C_PROD	1315	1.4456	1.0384	1.294	.4931	1.9446
Panel C: Sample of Regulatory Event in 2008 (2003-2014)						
Independent Variables						
INBD	2631	.3576	0.3333	.0869	.3077	.4
LOG_BDSIZE	2631	2.3701	2.3979	.2553	2.1972	2.5649
ROA	2631	.0496	0.0533	.0931	.0141	.0946
SIZE	2631	15.2758	15.0842	1.4711	14.1372	16.2983
MTB	2631	1.6005	1.1644	1.2256	.7121	2.1066
LEV	2631	.4092	0.4165	.2133	.2284	.5709
NOA	2631	1.3008	0.7927	1.371	.4971	1.4143
AEMt-1	2631	.0835	0.0514	.0891	.0232	.1069
DAt-1	2631	.0018	-0.0039	.1509	-.0529	.0488
C_PROD	2631	1.2295	0.8562	1.1878	.4191	1.5758

*Note: Variable definitions are in Table 19

Continuation of Table 18: Descriptive Statistics of Independent Variables

	Obs.	Mean	Median	SD	25th Percentile	75th Percentile
Panel D: Ownership Classification Sample of Regulatory Event in 1999 (1995-2003)						
Independent Variables						
INBD	1037	.2742	0.2667	.0963	.2	.3333
LOG_BDSIZE	1037	2.4605	2.4849	.28	2.3026	2.6391
ROA	1037	.0341	0.0455	.0982	.0031	.0843
SIZE	1037	14.9555	14.7557	1.3293	13.9761	15.7803
MTB	1037	1.2017	0.8111	1.0609	.478	1.5245
LEV	1037	.4789	0.4910	.238	.2936	.6568
NOA	1037	1.4858	0.9566	1.4286	.6113	1.6844
AEMt-1	1026	.083	0.0568	.0834	.0249	.1077
DAt-1	1026	-.0057	-0.0033	.1424	-.0599	.0539
C_PROD	1037	1.3606	1.0022	1.2137	.4919	1.7328
Panel E: Ownership Classification Sample of Regulatory Event in 2008 (2003-2014)						
Independent Variables						
INBD	2189	.3504	0.3333	.0856	.3	.4
LOG_BDSIZE	2189	2.3896	2.3979	.2465	2.1972	2.5649
ROA	2189	.0561	0.0569	.0852	.0187	.097
SIZE	2189	15.2297	15.0730	1.4137	14.1248	16.1606
MTB	2189	1.5256	1.1327	1.162	.7046	1.945
LEV	2189	.4091	0.4150	.2156	.2241	.5713
NOA	2189	1.1964	0.7797	1.2147	.4999	1.322
AEMt-1	2185	.0814	0.0497	.0888	.0218	.1028
DAt-1	2185	-.0033	-0.0047	.1508	-.0521	.0467
C_PROD	2189	1.2128	0.8913	1.131	.4498	1.5462

*Note: Variable definitions are in Table 19

Continuation of Table 18: Descriptive Statistics of Independent Variables

	Obs.	Mean	Median	SD	25th Percentile	75th Percentile
Panel F: Ownership Concentration Sample of Regulatory Event in 1999 (1995-2003)						
Independent Variables						
INBD	1330	.2726	0.2667	.0983	.2	.3333
LOG_BDSIZE	1330	2.4452	2.4849	.2797	2.3026	2.6391
TOP FIVE	1313	58.1014	58.3100	16.4981	46.03	69.83
TOP TEN	1313	70.0241	71.6000	14.4187	61.4	80.03
ROA	1330	.0272	0.0424	.107	-.0076	.0839
SIZE	1330	15.0221	14.8336	1.3742	13.9885	15.8586
MTB	1330	1.2077	0.8405	1.0542	.4828	1.5264
LEV	1330	.5024	0.5173	.2424	.3197	.6794
NOA	1330	1.6032	1.0083	1.5278	.6252	1.9003
AEMt-1	1330	.0871	0.0595	.0856	.0273	.1129
DAt-1	1330	-.0107	-0.0035	.1512	-.066	.0552
C_PROD	1330	1.4686	1.0484	1.3182	.4961	1.9488
Panel G: Ownership Concentration Sample of Regulatory Event in 2008 (2003-2014)						
Independent Variables						
INBD	2635	.3576	0.3333	.0869	.3077	.4
LOG_BDSIZE	2635	2.3703	2.3979	.2555	2.1972	2.5649
TOP FIVE	2596	57.6434	57.5550	17.5163	44.8	70.51
TOP TEN	2596	68.4351	70.2900	15.4633	57.975	79.98
ROA	2635	.0494	0.0533	.0934	.0141	.0944
SIZE	2635	15.2739	15.0787	1.4734	14.1344	16.3029
MTB	2635	1.6004	1.1683	1.2248	.7129	2.1043
LEV	2635	.4095	0.4168	.2134	.2284	.5723
NOA	2635	1.3085	0.7927	1.3831	.4971	1.4245
AEMt-1	2635	.0837	0.0514	.0893	.0232	.1072
DAt-1	2635	.0017	-0.0037	.1516	-.0528	.0491
C_PROD	2635	1.229	0.8542	1.1912	.4163	1.5672

*Note: Variable definitions are in Table 19

Table 19: Variable Definitions of Independent Variables

Variables	Definitions
INBD	Proportion of independent directors calculated by the number of independent directors divided by total board size
LOG_BDSIZE	Log of total board size
ROA	Return on assets calculated as the ratio of income before extraordinary items to total asset
SIZE	Firm size computed as the logarithm of total assets
MTB	Market-to-book value computed as the ratio of market value of equity to book value of equity
LEV	Firm's leverage computed as the total liabilities divided by total assets
NOA	Net operating assets measured by the ratio of net operating assets at the beginning of the year divided by the lagged sales
AEM_{t-1}	Absolute value of discretionary accruals in year t − 1
DA_{t-1}	Signed (raw value) of discretionary accruals in year t − 1
C_PROD	Firm's production capacity computed by property, plant and equipment divided by current sale
FAM_C25	Dummy variable for family ownership threshold at 25%
FAM_C10	Dummy variable for family ownership threshold at 10%
OWN_T_FIVE	Dummy variable for top five ownership concentration level
OWN_T_TEN	Dummy variable for top ten ownership concentration level

Table 20: Pearson Correlation Between Earnings Management and Control Variables of The Full Sample Period (1995-2014)

Variables	AEM	DA	AB_CFO	AB_DISEX	AB_PROD_1	REM	POST_REG	INBD	ROA	SIZE	MTB	LEV	NOA	DA_{t-1}	C_PROD
AEM	1.00														
DA	-0.07***	1.00													
AB_CFO	0.05***	0.44***	1.00												
AB_DISEX	-0.04***	0.01	-0.01	1.00											
AB_PROD_1	0.05***	0.25***	0.45***	0.39***	1.00										
REM	0.05***	0.34***	0.59***	0.55***	0.84***	1.00									
POST_REG	-0.03*	-0.02*	0.00	0.00	0.00	0.00	1.00								
INBD	0.00	0.00	0.02*	0.02*	0.01	0.01	0.20***	1.00							
ROA	-0.14***	0.33***	-0.22***	0.02	-0.23***	-0.27***	0.02*	0.00	1.00						
SIZE	-0.06***	0.08***	0.05***	0.02*	0.05***	0.06***	-0.01	0.07***	0.01	1.00					
MTB	0.10***	-0.02	-0.11***	-0.12***	-0.19***	-0.21***	0.03*	0.10***	0.20***	0.10***	1.00				
LEV	0.19***	-0.05***	0.16***	-0.05***	0.11***	0.16***	-0.06	-0.10***	-0.35***	0.19***	0.12***	1.00			
NOA	0.04**	0.01	0.06***	0.07***	0.14***	0.12***	-0.01	0.00	-0.22***	0.20***	-0.16***	0.05***	1.00		
DA_{t-1}	-0.03**	0.10***	0.08***	0.00	0.10***	0.09***	-0.04	0.00	0.05***	0.10***	-0.06***	-0.05***	0.09***	1.00	
C_PROD	-0.03***	-0.02*	0.01	0.10***	0.06***	0.08***	0.00	0.00	-0.24***	0.11***	-0.11***	0.02**	0.66***	-0.03**	1.00

***, **, *** Significant at 10 percent 5 percent and 1 percent levels, respectively**

4.2 Empirical Results

4.2.1. Regression Results of the Association of the Degree of AEM and REM and Regulatory Regime Change in 1999 and 2008

This section demonstrates the regression results for hypothesis H1a, H1b, H2a and H2b which hypotheses the degree of earnings management declines post-regulatory reform both in 1999 and 2008. Subsequent regression results of hypotheses H4a, H4b, H5a and H5b which hypotheses the degree of earnings management declines post-regulatory reform both in 1999 and 2008. Additionally, as part of robustness analysis this paper looks at ownership concentration effect on earnings management strategies which allow insights of both family and institutional ownership.

Table 21 reports the results of the effect of both regulatory regime changes in 1999 and 2008 on earnings management strategies – AEM, DA and REM. The regression results are of hypothesis tests H1a, H1b, H2a and H2b stated in Section 3.4.1. In addition to AEM, as part of robustness analysis I also use signed (raw value) of accruals earnings management which is DA.

Panel A in Table 21 reports the regression results of regulatory event in 1999 and Panel B in Table 21 the regression of results of regulatory event in 2008 is reported. Since the basis of the regulatory events is board independence, it is expected that the variable of interest POST_REG if significant then the variable INBD should also show similar results. However, the actual results do not indicate a similar trend between POST_REG and INBD. In order to address this issue and whether any unobserved factors are driving the results I run the regression once excluding the INBD variable, once without the POST_REG variable and then once including all variables in the equation (combined).

The dummy variable POST_REG, which is the variable of interest capturing the effect of regulatory regime change on AEM in the combined regression, is not significant and has a coefficient of -0.0151 in the Panel A and a coefficient of 0.0035 in Panel B for the regulatory event in 1999 and 2008 respectively. The effect of

regulatory regime in 1999 on REM is not significant and has a coefficient of 0.0001 in Panel A. However, the effect on regulatory regime changes in 2008 on REM is significant at 1% and has a coefficient of -0.0568 in Panel B. This indicates the period after regulatory event in 2008 is characterized by lower earnings management through REM. The results provide evidence that as a proportionate number of independent directors are instated on board resulted higher degree of monitoring thus lower earnings management through REM.

Table 21: Regression Results of Association of AEM and REM and Regulatory Regime Change in 1999 and 2008

PANEL A: REGRESSION RESULTS OF ASSOCIATION OF AEM AND REM AND REGUALTORY CHANGE IN 1999

	AEM			**DA**			**REM**		
VARIABLES	POST_REG	INBD	COMBINED	POST_REG	INBD	COMBINED	POST_REG	INBD	COMBINED
Constant	-0.2183	-0.2575	-0.2575	-0.8468***	-0.8501***	-0.8501***	-0.5987	-0.6363*	-0.6363*
	(-1.40)	(-1.64)	(-1.64)	(-3.37)	(-3.36)	(-3.36)	(-1.61)	(-1.69)	(-1.69)
POST_REG	-0.0087		-0.0151	-0.0082		-0.0078	0.0074		0.0001
	(-0.97)		(-1.47)	(-0.65)		(-0.52)	(0.33)		(0.01)
INBD		0.0624	0.0624		0.0010	0.0010		0.0674	0.0674
		(1.34)	(1.34)		(0.01)	(0.01)		(0.59)	(0.59)
ROA	-0.0475	-0.0482	-0.0482	0.7729***	0.7724***	0.7724***	-0.2286***	-0.2332***	-0.2332***
	(-0.93)	(-0.94)	(-0.94)	(12.97)	(12.89)	(12.89)	(-2.66)	(-2.71)	(-2.71)
SIZE	0.0186*	0.0205*	0.0205*	0.0528***	0.0531***	0.0531***	0.0404	0.0422*	0.0422*
	(1.73)	(1.90)	(1.90)	(3.15)	(3.15)	(3.15)	(1.64)	(1.70)	(1.70)
MTB	0.0021	0.0023	0.0023	-0.0064	-0.0069	-0.0069	-0.0132**	-0.0141**	-0.0141**
	(0.71)	(0.74)	(0.74)	(-1.29)	(-1.35)	(-1.35)	(-2.00)	(-2.10)	(-2.10)
LEV	0.0399	0.0381	0.0381	0.0688*	0.0697*	0.0697*	0.0410	0.0399	0.0399
	(1.53)	(1.46)	(1.46)	(1.80)	(1.80)	(1.80)	(0.80)	(0.78)	(0.78)
LOSS	-0.0018	-0.0018	-0.0018	-0.0032	-0.0035	-0.0035	0.0263	0.0258	0.0258
	(-0.23)	(-0.24)	(-0.24)	(-0.26)	(-0.29)	(-0.29)	(1.63)	(1.59)	(1.59)
Observations	1,776	1,759	1,759	1,776	1,759	1,759	1,619	1,603	1,603
Adjusted R-squared	0.0690	0.0698	0.0698	0.2163	0.2154	0.2154	0.0436	0.0445	0.0445
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
F-statistic	7.827	7.247	7.247	23.05	21.21	21.21	3.540	3.475	3.475

Note: Variable definitions are given in Table 7 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

The coefficient of ROA is significant at 1% and has a positive value of (0.7724) and (0.5868) for dependent variable DA over the sample period of regulatory event in 1999 and 2008 respectively. Additionally, with dependent variable as REM, ROA is negative (-0.2332) and (-0.5359) and is significant at 1% for both the regulatory event in 1999 and 2008 respectively. This provides evidence that good firm performance is associated with higher accrual-based earnings management and lower

REM (recall REM has negative effect on long term valuation). SIZE is significant at 1% with positive coefficient (0.0531) for DA for the sample period of regulatory event in 1999 and also is significant at 1% with positive coefficient (0.0690) with dependent variable as REM for the sample period of regulatory event in 2008. Moreover, MTB is positive (0.0065) significant at 1% and negative (-0.0205) significant at 1% for AEM and REM respectively over the sample period of regime change in 2008.

PANEL B: REGRESSION RESULTS OF ASSOCIATION OF AEM AND REM AND REGUALTORY CHANGE IN 2008

	AEM			DA			REM		
VARIABLES	POST_REG	INBD	COMBINED	POST_REG	INBD	COMBINED	POST_REG	INBD	COMBINED
Constant	0.1355**	0.1442**	0.1442**	-0.2077*	-0.2323**	-0.1960*	-0.9742***	-0.9694***	-0.9694***
	(2.05)	(2.11)	(2.11)	(-1.87)	(-2.34)	(-1.76)	(-4.17)	(-4.07)	(-4.07)
POST_REG	0.0019		0.0035	0.0024		0.0046	-0.0587***		-0.0568**
	(0.25)		(0.43)	(0.46)		(0.82)	(-2.80)		(-2.58)
INBD		-0.0230	-0.0230		-0.0535	-0.0622		-0.0170	-0.0170
		(-0.72)	(-0.72)		(-1.32)	(-1.42)		(-0.22)	(-0.22)
ROA	-0.0066	-0.0072	-0.0072	0.5894***	0.5851***	0.5868***	-0.5341***	-0.5339***	-0.5339***
	(-0.19)	(-0.21)	(-0.21)	(10.16)	(10.13)	(10.17)	(-6.24)	(-6.23)	(-6.23)
SIZE	-0.0045	-0.0045	-0.0045	0.0107	0.0137*	0.0114	0.0689***	0.0690***	0.0690***
	(-0.98)	(-0.99)	(-0.99)	(1.39)	(1.96)	(1.48)	(4.29)	(4.27)	(4.27)
MTB	0.0066***	0.0065***	0.0065***	-0.0041	-0.0035	-0.0041	-0.0206***	-0.0205***	-0.0205***
	(2.94)	(2.91)	(2.91)	(-1.23)	(-1.09)	(-1.23)	(-3.45)	(-3.42)	(-3.42)
LEV	0.0121	0.0122	0.0122	0.0515*	0.0472*	0.0497*	0.1089**	0.1087**	0.1087**
	(0.79)	(0.80)	(0.80)	(1.81)	(1.67)	(1.74)	(2.29)	(2.28)	(2.28)
LOSS	0.0073	0.0072	0.0072	0.0007	0.0008	0.0006	-0.0025	-0.0025	-0.0025
	(1.22)	(1.19)	(1.19)	(0.07)	(0.08)	(0.05)	(-0.16)	(-0.16)	(-0.16)
Observations	4,454	4,440	4,440	4,454	4,440	4,440	4,404	4,390	4,390
Adjusted R-squared	0.0285	0.0282	0.0282	0.0811	0.0819	0.0818	0.0677	0.0674	0.0674
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	NO	NO	YES	YES	YES	YES
F-statistic	7.098	6.690	6.690	27.97	28.87	24.95	7.245	6.841	6.841

Note: Variable definitions are given in Table 7 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 22 and 23 show the regression results of family ownership classification sample for regulatory event in 1999 and 2008 respectively with ownership threshold set at 25% and a lower threshold set at 10%. Regressions excluding POST_REG and INBD separately are not run for family ownership classification sample given the sample is a sub-sample from the full sample used in regressions used in Table 21.

The variable of interest POST_REG is not significant for any of the earnings management proxies AEM, DA and REM for the regulatory events in 1999 (Table

22). POST_REG however is significant and negative with value -0.0758 at 5% with dependent variable as REM for family ownership control at 10% for sample of regulatory event in 2008 (Table 23). This result implies higher proportion of independent directors on the board are able to constrain earning management through REM.

In Table 22, ROA is significant at 1% with dependent variable DA for both ownership thresholds at 25% and 10% with value of (0.7204) and (0.7077) respectively during regulatory event in 1999. Subsequently during regulatory event in 1999, ROA is significant at 1% with dependent variable REM for both thresholds 25% and 10% with values of -0.3560 and -0.3478 which indicates good firm performance is associated with lower earnings management through REM in family firms. The findings are similar to what is observed in the full sample regression results in Table 21 indicating good firm performance is associated with higher earnings management through accruals and lower earnings management through real earnings management strategy.

SIZE is significant at 5% and 1% for both family ownership thresholds level with dependent variable AEM and DA respectively with value of 0.0249, 0.0251 and 0.0555, 0.0559 respectively. MTB indicates significance at 1% with dependent variable REM for threshold level at 25% and 10% with value -0.0214 and -0.0218 respectively.

During regulatory event in 2008 ROA is significant and positive at 1% for DA with value of (0.05023) and (0.5029) for threshold level 25% and 10% respectively. ROA with dependent variable as REM also indicates significance level at 5% (0.8259) for threshold level 25% and a negative value of (-0.8267) significant at 1% for threshold level at 10%. SIZE is significant at 5% (0.0748) for threshold level at 25% and significant at 1% (0.0745) for threshold level at 10%.

Table 22: Earnings Management of Family Firms Ownership Classification with Cut Off at 25% and 10% in 1999

	Family Ownership Control Threshold at 25%			**Family Ownership Control Threshold at 10%**		
VARIABLES	AEM	DA	REM	AEM	DA	REM
Constant	-0.3179*	0.8740***	-0.5171	-0.3152*	0.8714***	-0.5146
	(-1.80)	(-3.03)	(-1.23)	(-1.79)	(-3.01)	(-1.21)
POST_REG	-0.0191	-0.0222	-0.0037	-0.0218*	-0.0314	-0.0032
	(-1.56)	(-1.19)	(-0.12)	(-1.75)	(-1.55)	(-0.11)
INBD	0.0767	0.0603	0.0083	0.0819*	0.0601	0.0175
	(1.59)	(0.85)	(0.07)	(1.70)	(0.81)	(0.15)
FAM_C25	0.0006	0.0258	-0.0240			
	(0.05)	(1.54)	(-0.94)			
FAM_C10				-0.0130	0.0112	-0.0275
				(-1.16)	(0.66)	(-1.03)
POST_REG*FAM_C25	-0.0031	-0.0062	0.0108			
	(-0.28)	(-0.42)	(0.50)			
POST_REG*FAM_C10				0.0001	0.0095	0.0074
				(0.01)	(0.61)	(0.35)
ROA	-0.0582	0.7204***	-0.3560***	-0.0575	0.7077***	-0.3478***
	(-0.90)	(9.41)	(-2.90)	(-0.88)	(9.10)	(-2.85)
SIZE	0.0249**	0.0555***	0.0392	0.0251**	0.0559***	0.0390
	(2.05)	(2.88)	(1.41)	(2.08)	(2.87)	(1.39)
MTB	0.0022	-0.0106*	-0.0214***	0.0022	-0.0104*	-0.0218***
	(0.60)	(-1.81)	(-2.86)	(0.60)	(-1.78)	(-2.91)
LEV	0.0300	0.0348	0.0079	0.0316	0.0333	0.0128
	(1.01)	(0.82)	(0.13)	(1.06)	(0.77)	(0.21)
LOSS	-0.0027	-0.0010	0.0235	-0.0026	-0.0028	0.0239
	(-0.31)	(-0.07)	(1.30)	(-0.30)	(-0.19)	(1.33)
Observations	1,362	1,362	1,236	1,362	1,362	1,236
Adjusted R-squared	0.0607	0.1749	0.0622	0.0625	0.1743	0.0625
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES
F-statistic	5.160	11.91	3.346	5.219	11.86	3.546

Note: Variable definitions are given in Table 7 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

LEV shows significant at 1% with dependent variable DA for both threshold level with value of (0.1255) and (0.1246) respectively. Significance at 5% level is found with dependent variable REM for both threshold level with value of 0.1295 and 0.1299 respectively.

Table 23: Earnings Management of Family Firms Ownership Classification with Cut Off at 25% and 10% for Regulatory Event in 2008

	Family Ownership Control Threshold at 25%			**Family Ownership Control Threshold at 10%**		
VARIABLES	AEM	DA	REM	AEM	DA	REM
Constant	0.0242	-0.1756	1.0211**	0.0300	-0.1802	-1.0270***
	(0.28)	(-1.21)	(-3.20)	(0.35)	(-1.21)	(-3.17)
POST_REG	-0.0012	-0.0048	0.0811**	0.0015	-0.0041	-0.0758**
	(-0.12)	(-0.56)	(-2.91)	(0.15)	(-0.47)	(-2.45)
INBD	0.0199	0.0094	-0.0814	0.0165	0.0099	-0.0853
	(0.58)	(0.20)	(-0.89)	(0.49)	(0.21)	(-0.93)
FAM_C25	-0.0083	-0.0018	-0.0255			
	(-0.72)	(-0.07)	(-0.67)			
FAM_C10				-0.0130	-0.0065	-0.0015
				(-1.59)	(-0.30)	(-0.04)
POST_REG*FAM_C25	0.0001	0.0173*	0.0215			
	(0.02)	(1.94)	(1.10)			
POST_REG*FAM_C10				-0.0025	0.0129	0.0099
				(-0.34)	(1.41)	(0.47)
ROA	-0.0169	0.5023***	0.8259**	-0.0149	0.5029***	-0.8267***
	(-0.39)	(7.44)	(-6.31)	(-0.34)	(7.39)	(-6.25)
SIZE	0.0021	0.0068	0.0748**	0.0020	0.0074	0.0745***
	(0.35)	(0.70)	(3.54)	(0.34)	(0.72)	(3.48)
MTB	0.0054**	-0.0089**	-0.0158**	0.0053**	-0.0089**	-0.0160**
	(2.02)	(-2.38)	(-2.36)	(2.00)	(-2.38)	(-2.38)
LEV	0.0327*	0.1255***	0.1295**	0.0324*	0.1246***	0.1299**
	(1.93)	(4.22)	(2.19)	(1.92)	(4.17)	(2.18)
LOSS	0.0066	-0.0100	-0.0300	0.0067	-0.0098	-0.0302
	(0.96)	(-0.87)	(-1.59)	(0.98)	(-0.84)	(-1.59)
Observations	3,034	3,034	3,010	3,034	3,034	3,010
Adjusted R-squared	0.0294	0.0505	0.1031	0.0301	0.0500	0.1024
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	YES	NO	YES
F-statistic	4.917	11.32	7.552	4.907	10.94	7.607

Note: Variable definitions are given in Table 7 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 24 and 25[6] shows regression results which is part of robust analysis testing the effect of top five and top ten ownership concentration level on earnings management proxies. The variable OWN_T_TEN for regulatory event in 1999 result is positive and significant at 5% indicating higher ownership level is associated with higher level of REM. While the variable of interest POST_REG*OWN_T_FIVE and POST_REG*OWN_T_TEN is not significant, ROA is significant at 1% for both DA and REM for both top five and top ten ownership concentration level for regulatory event in 1999. SIZE is also significant at 1% with dependent variable DA.

[6] I don't run separate regressions exclude POST_REG and INBD on the basis that the sample firms are sub-sample of the sample used in the regressions in Table 21

Table 24: Earnings Management of Top Five and Top Ten Ownership Concentration Sample for Regulatory Event in 1999

	Top 5 Ownership			Top 10 Ownership		
VARIABLES	AEM	DA	REM	AEM	DA	REM
Constant	-0.2544	0.8459***	-0.6309*	-0.2532	0.8506***	-0.6467*
	(-1.63)	(-3.35)	(-1.68)	(-1.61)	(-3.33)	(-1.70)
POST_REG	-0.0125	0.0035	0.0158	-0.0134	-0.0009	0.0081
	(-1.12)	(0.23)	(0.54)	(-1.21)	(-0.06)	(0.28)
INBD	0.0633	0.0051	0.0699	0.0638	0.0049	0.0692
	(1.35)	(0.07)	(0.62)	(1.36)	(0.07)	(0.62)
OWN_T_FIVE	0.0079	0.0067	0.0180			
	(0.90)	(0.54)	(1.01)			
POST_REG* OWN_T_FIVE	-0.0042	-0.0210	-0.0321			
	(-0.44)	(-1.43)	(-1.52)			
OWN_T_TEN				0.0023	0.0093	0.0442**
				(0.27)	(0.72)	(2.41)
POST_REG*OWN_T_TEN				-0.0024	-0.0141	-0.0232
				(-0.24)	(-0.92)	(-1.14)
ROA	-0.0470	0.7686***	0.2388***	-0.0476	0.7716***	0.2312***
	(-0.92)	(12.83)	(-2.78)	(-0.93)	(12.83)	(-2.71)
SIZE	0.0199*	0.0525***	0.0411*	0.0201*	0.0528***	0.0413
	(1.85)	(3.13)	(1.65)	(1.87)	(3.12)	(1.65)
MTB	0.0023	-0.0071	-0.0140**	0.0023	-0.0069	-0.0136**
	(0.74)	(-1.41)	(-2.09)	(0.76)	(-1.36)	(-2.00)
LEV	0.0383	0.0708*	0.0425	0.0364	0.0700*	0.0455
	(1.47)	(1.80)	(0.82)	(1.40)	(1.79)	(0.87)
LOSS	-0.0017	-0.0035	0.0260	-0.0017	-0.0031	0.0263
	(-0.22)	(-0.29)	(1.62)	(-0.22)	(-0.26)	(1.64)
Observations	1,750	1,750	1,594	1,750	1,750	1,594
Adjusted R-squared	0.0682	0.2150	0.0452	0.0677	0.2143	0.0478
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES
F-statistic	6.294	18.80	3.176	6.298	18.85	3.544

Note: Variable definitions are given in Table 7 and 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Results for regulatory event in 2008 of top five and top 10 ownership concentration level which shows the degree of REM increased post-regulatory regime change. The variable of interest POST_REG is positive and significant at 1% with dependent variable as REM for both top five and top ten ownership concentration level. This indicates higher ownership level leads to higher degree of REM. Similar results as regulatory event in 1999 are observed for ROA during the regulatory event in 2008. ROA is positive and significant at 1% for both DA and REM for both top 5 and top 10 ownership concentration level. However, SIZE is significant at 1% with a positive relation for REM for both ownership level which indicates the higher size of the firm higher degree of earning management is observed through REM. MTB is

significant at 1% and positive for both ownership level with earnings management proxies AEM and REM.

Table 25: Earnings Management of Top Five and Top Ten Ownership Concentration Sample for Regulatory Event in 2008

	Top 5 Ownership			Top 10 Ownership		
VARIABLES	AEM	DA	REM	AEM	DA	REM
Constant	0.1349**	-0.1927*	0.9931***	0.1292*	-0.1970*	1.0098***
	(1.98)	(-1.72)	(-4.20)	(1.90)	(-1.75)	(-4.25)
POST_REG	-0.0008	0.0019	0.0642***	-0.0033	0.0004	0.0633***
	(-0.09)	(0.23)	(-2.76)	(-0.38)	(0.05)	(-2.69)
INBD	-0.0213	-0.0614	-0.0142	-0.0196	-0.0609	-0.0119
	(-0.67)	(-1.40)	(-0.18)	(-0.61)	(-1.38)	(-0.15)
OWN_T_FIVE	0.0059	-0.0155	0.0172			
	(1.02)	(-1.51)	(1.13)			
POST_REG*OWN_T_FIVE	0.0075	0.0055	0.0148			
	(1.29)	(0.62)	(0.88)			
OWN_T_TEN				0.0035	-0.0094	0.0274*
				(0.59)	(-0.96)	(1.80)
POST_REG*OWN_T_TEN				0.0122**	0.0084	0.0111
				(2.06)	(0.93)	(0.66)
ROA	-0.0088	0.5871***	0.5369***	-0.0082	0.5863***	0.5345***
	(-0.26)	(10.12)	(-6.30)	(-0.24)	(10.11)	(-6.29)
SIZE	-0.0040	0.0116	0.0701***	-0.0036	0.0118	0.0708***
	(-0.89)	(1.51)	(4.35)	(-0.80)	(1.52)	(4.39)
MTB	0.0064***	-0.0041	0.0208***	0.0065***	-0.0042	0.0205***
	(2.86)	(-1.23)	(-3.49)	(2.93)	(-1.24)	(-3.43)
LEV	0.0105	0.0505*	0.1063**	0.0107	0.0492*	0.1075**
	(0.69)	(1.77)	(2.24)	(0.71)	(1.72)	(2.26)
LOSS	0.0067	0.0008	-0.0037	0.0070	0.0003	-0.0024
	(1.11)	(0.08)	(-0.23)	(1.16)	(0.03)	(-0.15)
Observations	4,428	4,428	4,378	4,428	4,428	4,378
Adjusted R-squared	0.0290	0.0820	0.0681	0.0296	0.0817	0.0689
Industry Fixed Effect	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	YES	NO	YES
F-statistic	6.129	20.40	6.353	6.345	19.45	6.920

Note: Variable definitions are given in Table 7 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

4.2.2. Regression Results of Substitution Between Earnings Management Strategies

This section demonstrates the regression results of hypothesis H3a, H3b, H6a and H6b which hypothesis listed firms in the Thailand and subset of family firms substitute between AEM and REM. Additionally, as part of robustness I include DA which is the signed (raw value) of discretionary accruals as a dependent variable to test substitution of earnings management strategies among Thai firms.

According to Zang (2012) based on the realized outcome of REM during the fiscal year firms adjust AEM end of the fiscal year. The author along with Sarra et al. (2019) also provided evidence that firms undertake AEM or REM based on the costliness of the strategies. This led to a joint decision in managing earnings through AEM and REM which leads to the argument by these authors that AEM is endogenous in REM equation and REM in AEM equation.

In such case of endogeneity, the ordinary least square (OLS) becomes inconsistent and biased and estimation of simultaneous equation using two-stage least squares 2SLS yields unbiased results which this study has adopted to test substitution between earnings management strategies.

Table 26 and 27 shows results of simultaneous equations model of substitution between AEM, DA and REM which demonstrates results based on the OLS and 2SLS method, testing substitution between earnings management hypothesis H3a and H3b in section 3.4.2. Since in the presence of endogeneity the OLS estimator becomes inconsistent, I base my results on 2SLS. The results for the regulatory event in 1999 and 2008 do not indicate any significance for REM with dependent variable AEM and AEM with dependent variable as REM. However, over the sample period of regulatory event in 1999 DA with dependent variable as REM shows a positive coefficient of 0.7653 at 5% significance level. This suggests a complementary relationship. This provides evidence that Thai listed firms use accruals and real earnings measures simultaneously.

Table 26: Regression Results for Association between Earnings Substitution and Regulatory Regime Change in 1999

VARIABLES	(1) OLS AEM	(2) 2SLS AEM	(3) OLS DA	(4) 2SLS DA	(5) OLS REM	(6) 2SLS REM	(7) OLS REM	(8) 2SLS REM
Constant	-0.2240	3.1896	-0.5120**	0.6348	-0.5010	-0.0567	-0.1385	0.0163
	(-1.17)	(0.07)	(-1.98)	(0.48)	(-1.27)	(-0.01)	(-0.43)	(0.03)
AEM					-0.1261	3.3273		
					(-1.24)	(0.05)		
REM	0.0144	5.8152	0.3532***	2.9652				
	(0.61)	(0.07)	(9.64)	(1.13)				
DA							0.7486***	0.7653**
							(10.09)	(2.15)
POST_REG	-0.0023	-0.2056	-0.0317**	-0.0804	0.0085	-0.4436	0.0422**	0.0459**
	(-0.24)	(-0.07)	(-2.36)	(-1.25)	(0.59)	(-0.29)	(2.14)	(2.20)
INBD	0.0422	-1.2576	0.0342	-0.2061	0.0975	0.2733	0.0263	0.0034
	(0.89)	(-0.08)	(0.46)	(-0.63)	(0.99)	(0.08)	(0.25)	(0.03)
POST_REG*REM	-0.0081	11.1751	-0.0192	-1.9409				
	(-0.41)	(0.08)	(-0.69)	(-1.35)				
POST_REG*AEM					0.2060	5.4166		
					(1.52)	(0.43)		
POST_REG*DA							-0.3763***	-0.1117
							(-3.91)	(-0.21)
ROA	-0.1610***	3.3496	0.7989***	1.0190**	-0.2942***	0.3551	-0.7771***	-0.8310***
	(-3.66)	(0.07)	(15.00)	(2.16)	(-4.09)	(0.03)	(-9.33)	(-3.04)
SIZE	0.0185	-0.1461	0.0313*	-0.0404	0.0307	-0.0101	0.0088	-0.0009
	(1.42)	(-0.06)	(1.77)	(-0.49)	(1.21)	(-0.01)	(0.43)	(-0.03)
MTB	0.0062	0.1418	-0.0025	0.0316	-0.0152**	-0.0186	-0.0110*	-0.0113*
	(1.63)	(0.07)	(-0.49)	(0.80)	(-2.51)	(-0.18)	(-1.84)	(-1.75)
LEV	0.0058	-0.7160	0.0197	0.0898	0.0128	-0.3301	0.0045	0.0116
	(0.20)	(-0.07)	(0.45)	(0.72)	(0.23)	(-0.15)	(0.08)	(0.19)
NOA	-0.0004	-0.1603	0.0056	-0.0232	0.0151	0.0162	0.0109	0.0081
	(-0.10)	(-0.07)	(0.66)	(-0.62)	(1.21)	(0.13)	(0.86)	(0.49)
Observations	1,333	1,315	1,333	1,315	1,333	1,333	1,333	1,333
Adjusted R-squared	0.1017	0.0469	0.3091	0.100	0.0474	0.0626	0.2288	0.295
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	NO	NO	YES	NO
F-statistic	7.146	0.00935	27.73	4.177	4.856	0.418	12.39	4.725

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 27: Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008

VARIABLES	(1) OLS AEM	(2) 2SLS AEM	(3) OLS DA	(4) 2SLS DA	(5) OLS REM	(6) 2SLS REM	(7) OLS REM	(8) 2SLS REM
Constant	0.0901	0.5176	-0.1165	0.6612	-0.9908***	-7.6006	-0.6162**	-0.7007
	(1.09)	(0.18)	(-0.78)	(1.25)	(-3.07)	(-0.21)	(-2.08)	(-0.52)
AEM					0.1234	-16.1448		
					(1.44)	(-0.29)		
REM	0.0099	1.1362	0.3480***	1.0314**				
	(0.71)	(0.50)	(15.34)	(2.41)				
DA							0.5992***	7.0681
							(10.46)	(1.28)
POST_REG	0.0078	-0.0066	0.0139	-0.0076	-0.0130	4.6993	-0.0370	0.0115
	(0.82)	(-0.10)	(1.10)	(-0.68)	(-0.46)	(0.20)	(-1.61)	(0.22)
INBD	-0.0383	-0.0761	-0.0231	-0.0298	-0.0561	-4.1768	-0.0061	-0.2384
	(-1.09)	(-0.48)	(-0.47)	(-0.40)	(-0.59)	(-0.21)	(-0.08)	(-0.55)
POST_REG*REM	-0.0084	-1.8615	-0.0634***	-0.1001				
	(-0.60)	(-0.65)	(-2.67)	(-0.49)				
POST_REG*AEM					-0.3050*	-67.7336		
					(-1.85)	(-0.20)		
POST_REG*DA							0.3232***	-11.4552
							(3.46)	(-1.10)
ROA	-0.0634*	0.1413	0.7662***	1.1613***	-0.6139***	1.8207	-1.0300***	-2.6639*
	(-1.65)	(0.09)	(13.32)	(4.10)	(-5.75)	(0.12)	(-10.33)	(-1.83)
SIZE	-0.0011	-0.0280	0.0046	-0.0463	0.0708***	0.6473	0.0468**	0.0666
	(-0.19)	(-0.14)	(0.46)	(-1.30)	(3.29)	(0.22)	(2.38)	(0.71)
MTB	0.0089***	0.0006	-0.0038	0.0088	-0.0219***	0.1727	-0.0136*	0.0026
	(3.07)	(0.01)	(-0.96)	(0.75)	(-2.78)	(0.22)	(-1.84)	(0.07)
LEV	0.0188	0.0465	0.0331	-0.0211	0.0404	1.3033	0.0088	-0.2024
	(1.08)	(0.18)	(1.09)	(-0.33)	(0.70)	(0.23)	(0.18)	(-0.66)
NOA	-0.0038	0.0039	-0.0033	-0.0014	0.0006	-0.0751	0.0028	0.0133
	(-1.42)	(0.23)	(-0.69)	(-0.16)	(0.07)	(-0.24)	(0.35)	(0.38)
Observations	2,867	2,632	2,867	2,632	2,867	2,866	2,867	2,866
Adjusted R-squared	0.0370	0.0468	0.2812	0.241	0.0831	0.0892	0.2867	0.0115
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	YES	NO	YES	NO
F-statistic	5.366	0.212	25.11	4.833	5.164	0.0534	17.70	0.844

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 28 : Descriptive Statistics of Positive and Negative Values of REM and DA

		Positive_DA	Negative_DA	Total
Positive_REM	*Mean of DA*	0.11	-0.09	0.01
	Mean of REM	0.25	0.17	0.21
	N	1,921	1,232	3153.00
Negative_REM	*Mean of DA*	0.08	-0.11	-0.02
	Mean of REM	-0.19	-0.25	-0.22
	N	997	1,986	2983.00
	Mean of DA	0.09	-0.10	-0.01
	Mean of REM	0.03	-0.04	-0.02
	N	2,918	3,218	6,136

Since DA is the signed or raw value of accruals earning management, the complementary relationship between DA and REM could be due to negative DA and negative REM[7] resulting in a positive coefficient suggesting a complementary relationship. However, it could also be argued that a positive DA and REM might have led to a positive coefficient. In order to provide clarity on the relationship between DA and REM, I repeat the same regression with positive and negative DA as independent variable and REM as dependent variable as tabulated in Table 29. The results do not indicate any significant relationship in terms of the direction or sign of the variable DA.

However, descriptive statistics of positive and negative REM and DA as tabulated in Table 28 indicate similar mean values for positive REM and negative REM (as shown in 1st and 4th quadrant) and also similar mean values for positive REM and negative REM (as shown in 1st and 4th quadrant). The number of observations is also similar for both the quadrants. Hence, the sample artifact does not also aid in implying whether the complementary relationship between DA and REM is due to positive or negative value of the earnings management proxies.

Regression results for regulatory event in 2008 also indicate a complementary relationship between DA and REM with DA as dependent variable REM is positive and significant at 5% with a coefficient of 1.0314. This provides evidence that listed

[7] REM proxy is not used as absolute value rather it is the summation of AB_CFO and AB_DISEX both multiplied by -1 and raw value of AB_PROD; thus, the value of REM proxy could either be positive or negative.

firms in Thailand strategically manipulate earnings reporting by simultaneously and jointly using REM and DA.

In robustness tests to investigate whether negative or positive DA has resulted in the complementary relationship, I repeat the same regression once with positive DA as dependent variable and once with negative DA as show in Table 29. I fail to find any significant result for regulatory event in 1999. Conversely for the regulatory event in 2008, I find a positive coefficient of 2.1130 and significant at 5% for negative DA as dependent variable and REM as independent variable. This provides evidence of the complementary relationship between DA and REM and indicates the direction of DA as negative discretionary accruals.

In comparison to other literatures, the results of complementary relationship is consistent with Chen et al. (2012) who provide evidence in Taiwanese market managers use the accruals and real earnings management jointly and simultaneously. Moreover, the results also complements findings of Sarra et al. (2019), providing evidence firms in Tunisia use accruals and real earnings management tools both as substitutes and simultaneously.

Table 29: Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008 with Variable DA Replaced with Positive and Negative DA

	Event 1 in 1999				Event 2 in 2008			
VARIABLES	OLS REM	2SLS REM	OLS REM	2SLS REM	OLS PDA	2SLS PDA	OLS NDA	2SLS NDA
Constant	-0.8272*	-0.8250	0.3354	0.9751	0.0339	15.6556	-0.2315	1.6961
	(-1.73)	(-0.37)	(0.80)	(0.77)	(0.23)	(0.21)	(-1.23)	(1.37)
REM					0.2223***	7.5158	0.1853***	2.1130**
					(7.51)	(0.21)	(5.60)	(2.22)
POSITIVE_DA	0.9531***	4.2538						
	(7.94)	(0.72)						
NEGATIVE_DA			0.5970***	-2.8031				
			(3.82)	(-0.65)				
POST_REG	0.1070***	0.5833	-0.0192	0.0155	0.0182	-0.2791	-0.0048	-0.0425
	(3.62)	(0.74)	(-0.56)	(0.08)	(1.14)	(-0.19)	(-0.28)	(-0.63)
INBD	-0.1191	0.6689	0.0995	0.2673	0.0019	1.7170	-0.0175	-0.0516
	(-0.93)	(0.73)	(0.62)	(0.79)	(0.03)	(0.20)	(-0.30)	(-0.22)
POST_REG*REM					-0.0585**	4.0684	-0.0229	-0.3814
					(-2.07)	(0.19)	(-1.16)	(-0.87)
POST_REG*POSITIVE_DA	-0.3795**	-7.4710						
	(-2.08)	(-0.70)						
POST_REG*NEGATIVE_DA			-0.4104**	0.8702				
			(-2.30)	(0.32)				
ROA	-0.8991***	-0.9095	-0.8009***	0.8352	0.5177***	2.4935	0.4275***	1.7050**
	(-7.48)	(-0.94)	(-7.11)	(0.44)	(7.21)	(0.25)	(5.21)	(2.50)
SIZE	0.0565*	0.0205	-0.0228	-0.1015	-0.0020	-1.0147	0.0099	-0.1000
	(1.78)	(0.13)	(-0.82)	(-0.86)	(-0.20)	(-0.21)	(0.76)	(-1.29)
MTB	-0.0076	0.0247	-0.0167**	-0.0250	0.0031	-0.1550	-0.0061	0.0316
	(-0.78)	(0.60)	(-1.99)	(-1.03)	(0.67)	(-0.19)	(-1.14)	(1.16)
LEV	0.0228	0.0768	-0.0281	0.1960	0.0471	-2.7214	0.0117	-0.0707
	(0.39)	(0.19)	(-0.40)	(0.60)	(1.48)	(-0.20)	(0.22)	(-0.37)
NOA	0.0101	0.0293	-0.0034	0.0616	-0.0045	-0.2371	0.0027	-0.0946
	(1.04)	(0.79)	(-0.12)	(0.72)	(-0.99)	(-0.22)	(0.47)	(-1.28)
Observations	638	638	695	695	1,369	676	1,498	782
Adjusted R-squared	0.3209	0.0431	0.1816	0.00108	0.1868	0.0324	0.1424	0.0573
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	NO	NO	YES	NO	YES	NO	YES	NO
F-statistic	8.437	0.831	9.633	1.413	10.35	0.0289	5.320	0.860

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 30, 31, 32 and 33 tabulates the regression results of hypothesis H6a, substitution between earnings management strategies of listed family firms in Thailand. In analysis earnings management substitution of family firms, I use two threshold levels of ownership control for family firms, a higher threshold of 25% and lower threshold level of 10%.

Initial results indicated complementary relationship between DA and REM for sample of regulatory event in 1999 with family ownership threshold at 25%. However, after using instrumental variables for the interaction terms in the regressions - the results changed, and no significant relationship is observed. I find no evidence of substitution or complementary relationship between accruals and real earnings management for a lower ownership threshold level of 10%. The results are similar for high ownership thresholding of 25% and lower threshold of 10% for sample of regulatory event in 2008.

In robustness analysis, I test earnings management substitution on ownership concentration level sample which allows to see earnings management substitution behavior of both family and institutional ownership. The sample is divided into top ten and top five ownership levels. Table 34 and 35 tabulates the results of top five and top 10 ownership level of regulatory event in 1999 respectively and table 36 and 37 tabulates the results of top five and top ten ownership level for regulatory event in 2008 respectively.

The initial 2SLS results of DA with dependent variable as REM was significant at 5% with positive coefficients for top five and top ten ownership sample of both regulatory events in 1999. The results had indicated a complementary relationship. However, using instrumental variables for the interaction terms in the regression equations has resulted in insignificant results for the sample of regulatory event in 1999.

Table 36 and 37 tabulates the results of earnings management substitution of top five and top ten ownership sample for regulatory event in 2008. The initial results had suggested complementary relationship between DA and REM for top five

ownership concentration sample, however the use of instrumental variable for the interaction terms lead to insignificant results. The results are significant at 5% with a positive coefficient of 1.0234 for top ten concentration level with DA as dependent variable and REM as independent variable. This suggests a complementary relationship between DA and REM when ownership concentration level is high.

However, I do not run any robustness test to investigate the direction of DA resulting in the complementary relationship since ownership sample as discussed earlier is used as crude proxy to represent family firms and do not give greater insight on any particular ownership class.

Table 30: Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 1999 of Family Firms with Control Threshold at 25%

VARIABLES	(1) OLS AEM	(2) 2SLS AEM	(3) OLS DA	(4) 2SLS DA	(5) OLS REM	(6) 2SLS REM	(7) OLS REM	(8) 2SLS REM
Constant	-0.2819	-0.1570	-0.4656*	1.0840	-0.3756	-0.6207	-0.1177	0.1750
	(-1.41)	(-0.01)	(-1.67)	(0.33)	(-0.85)	(-0.43)	(-0.35)	(0.36)
AEM					0.0591	-4.3336		
					(0.37)	(-0.55)		
REM	0.0280	-2.5552	0.3282***	4.3670				
	(0.86)	(-0.07)	(6.09)	(0.62)				
DA							0.7004***	1.2198
							(6.37)	(1.47)
POST_REG	0.0017	-0.1777	-0.0380***	-0.0852	0.0239	0.3065	0.0454**	0.0323
	(0.17)	(-0.07)	(-2.65)	(-0.93)	(0.93)	(0.44)	(2.02)	(1.01)
INBD	0.0429	0.1238	0.0825	-0.1080	0.0019	-0.0273	-0.0297	-0.0155
	(0.89)	(0.04)	(1.03)	(-0.19)	(0.02)	(-0.08)	(-0.26)	(-0.12)
FAMILY_C25	0.0054	0.4625	0.0234*	0.0260	-0.0282	-0.6595	-0.0371*	-0.0527*
	(0.44)	(0.09)	(1.69)	(0.25)	(-0.99)	(-0.80)	(-1.92)	(-1.69)
REM*POST_REG	-0.0086	10.1209	-0.0184	-2.9130				
	(-0.39)	(0.09)	(-0.65)	(-0.77)				
REM*FAM_C25	-0.0209	3.3592	0.0695	0.1666				
	(-0.58)	(0.09)	(1.19)	(0.04)				
AEM*POST_REG					0.0138	-3.6143		
					(0.08)	(-0.39)		
AEM*FAM_C25					-0.0435	7.3615		
					(-0.21)	(0.77)		
DA*POST_REG							-0.3048**	-0.1322
							(-2.54)	(-0.26)
DA*FAM_C25							0.1732	-0.7506
							(1.13)	(-0.64)
ROA	-0.1398**	2.2518	0.8351***	1.2985	-0.4049***	-0.2250	-0.8672***	-1.0621***
	(-2.32)	(0.07)	(11.00)	(1.37)	(-3.75)	(-0.20)	(-7.36)	(-3.04)
SIZE	0.0217	0.0071	0.0264	-0.0794	0.0273	0.0571	0.0121	-0.0052
	(1.59)	(0.00)	(1.40)	(-0.36)	(0.94)	(0.52)	(0.55)	(-0.17)
MTB	0.0063	0.0603	-0.0031	0.0586	-0.0255***	-0.0395	-0.0171**	-0.0118
	(1.32)	(0.05)	(-0.57)	(0.62)	(-3.03)	(-0.97)	(-2.32)	(-1.10)
LEV	0.0056	-0.2272	0.0141	0.2119	0.0235	0.2469	0.0082	-0.0363
	(0.17)	(-0.04)	(0.27)	(0.82)	(0.34)	(0.53)	(0.12)	(-0.40)
NOA	0.0018	-0.0439	0.0098	-0.0277	0.0096	0.0602	0.0032	-0.0011
	(0.33)	(-0.11)	(0.97)	(-0.55)	(0.57)	(0.86)	(0.19)	(-0.05)
Observations	1,037	1,026	1,037	1,026	1,037	1,037	1,037	1,037
Adjusted R-squared	0.0864	0.0401	0.3158	0.112	0.0633	0.185	0.2600	0.234
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	YES	NO	YES	NO
F-statistic	5.007	0.0107	19.93	1.055	2.902	0.511	8.008	3.954

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 31: Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 1999 of Family Firms with Control Threshold at 10%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
VARIABLES	AEM	AEM	DA2	DA	REM	REM	REM	REM
Constant	-0.2853	0.8420	-0.4811*	-0.1376	-0.3585	-1.3621	-0.0799	0.7067
	(-1.43)	(0.09)	(-1.72)	(-0.06)	(-0.80)	(-0.62)	(-0.24)	(0.31)
AEM					0.0896	-12.4800		
					(0.51)	(-0.55)		
REM	0.0424	0.2449	0.2769***	1.0361				
	(1.09)	(0.02)	(4.22)	(0.16)				
DA							0.5765***	3.2313
							(4.63)	(0.53)
POST_REG	0.0025	-0.1325	-0.0386***	0.0813	0.0228	-0.3051	0.0473**	0.0668
	(0.24)	(-0.16)	(-2.70)	(0.65)	(0.89)	(-0.44)	(2.14)	(0.98)
INBD	0.0399	-0.1385	0.0810	-0.0807	0.0101	-0.1578	-0.0180	0.0109
	(0.82)	(-0.11)	(1.00)	(-0.22)	(0.08)	(-0.29)	(-0.16)	(0.06)
FAM_C10	0.0061	0.0639	0.0124	0.0380	-0.0200	-0.4870	-0.0290	-0.0278
	(0.58)	(0.10)	(0.80)	(0.19)	(-0.78)	(-0.54)	(-1.51)	(-0.68)
REM*POST_REG	-0.0119	6.8827	-0.0136	-0.8987				
	(-0.51)	(0.18)	(-0.51)	(-0.29)				
REM*FAM_C10	-0.0371	0.3383	0.1345**	-3.1452				
	(-0.94)	(0.03)	(1.99)	(-0.40)				
AEM*POST_REG					0.0111	5.1857		
					(0.07)	(0.50)		
AEM*FAM_C10					-0.0854	7.1650		
					(-0.44)	(0.52)		
DA*POST_REG							-0.2709**	-0.2896
							(-2.28)	(-0.32)
DA*FAM_C10							0.3376**	-3.6199
							(2.31)	(-0.40)
ROA	-0.1423**	1.6675	0.8333***	-0.8012	-0.3962***	-1.7984	-0.8582***	-1.0655
	(-2.36)	(0.15)	(10.90)	(-0.91)	(-3.67)	(-0.69)	(-7.55)	(-1.33)
SIZE	0.0218	-0.0459	0.0280	0.0101	0.0260	0.1503	0.0095	-0.0445
	(1.61)	(-0.08)	(1.48)	(0.06)	(0.89)	(0.64)	(0.43)	(-0.29)
MTB	0.0065	0.0665	-0.0036	-0.0107	-0.0257***	-0.0068	-0.0193**	0.0018
	(1.39)	(0.14)	(-0.65)	(-0.17)	(-3.03)	(-0.18)	(-2.59)	(0.05)
LEV	0.0047	-0.2648	0.0137	-0.0997	0.0258	0.1116	0.0166	-0.1285
	(0.14)	(-0.14)	(0.26)	(-0.31)	(0.38)	(0.30)	(0.23)	(-0.53)
NOA	0.0024	-0.0137	0.0089	0.0636	0.0086	0.0318	0.0001	0.0155
	(0.45)	(-0.06)	(0.95)	(0.50)	(0.52)	(0.61)	(0.01)	(0.26)
Observations	1,037	1,026	1,037	1,026	1,037	1,037	1,037	1,037
Adjusted R-squared	0.0873	0.0101	0.3196	0.0789	0.0626	0.0533	0.2724	0.0326
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	YES	NO	YES	NO
F-statistic	5.233	0.0213	21.71	0.246	2.903	0.387	8.382	1.160

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 32: Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008 of Family Firms with Control Threshold at 25%

VARIABLES	(1) OLS AEM	(2) 2SLS AEM	(3) OLS DA	(4) 2SLS DA	(5) OLS REM	(6) 2SLS REM	(7) OLS REM	(8) 2SLS REM
Constant	-0.0132	1.0515	-0.0520	0.5895	-0.8066**	3.1596	-0.4737	-7.2074
	(-0.13)	(0.42)	(-0.29)	(0.34)	(-2.07)	(0.08)	(-1.31)	(-0.08)
AEM					0.1291	107.2612		
					(1.06)	(0.10)		
REM	-0.0006	2.5280	0.3682***	2.5635				
	(-0.03)	(0.44)	(11.04)	(0.41)				
DA							0.6967***	-5.8158
							(7.34)	(-0.07)
POST_REG	-0.0011	0.0565	0.0104	0.0113	-0.0020	-3.9601	-0.0334	-0.7996
	(-0.11)	(0.28)	(0.80)	(0.19)	(-0.07)	(-0.10)	(-1.39)	(-0.08)
INBD	0.0188	-0.3050	0.0197	-0.1761	-0.0786	0.1788	-0.0442	-3.1079
	(0.51)	(-0.37)	(0.37)	(-0.26)	(-0.76)	(0.03)	(-0.47)	(-0.07)
FAMILY_C25	0.0077	-0.0257	0.0274	0.0473	-0.0407	15.4486	-0.0555	0.7219
	(0.52)	(-0.10)	(0.95)	(0.33)	(-1.01)	(0.10)	(-1.44)	(0.07)
REM*POST_REG	-0.0170	-3.1001	-0.0826***	-0.7934				
	(-1.12)	(-0.51)	(-3.17)	(-0.59)				
REM*FAM_C25	0.0111	-3.5536	-0.0146	-2.5857				
	(0.46)	(-0.41)	(-0.37)	(-0.31)				
AEM*POST_REG					-0.4948***	65.5700		
					(-2.69)	(0.10)		
AEM*FAM_C25					-0.0266	-156.1961		
					(-0.17)	(-0.10)		
DA*POST_REG							0.4159***	-86.6686
							(3.98)	(-0.07)
DA*FAM_C25							-0.1975*	122.1963
							(-1.69)	(0.08)
ROA	-0.0605	-0.1226	0.7846***	1.4115	-0.7633***	-3.4128	-1.2001***	-9.3555
	(-1.27)	(-0.05)	(15.43)	(0.84)	(-5.89)	(-0.13)	(-11.40)	(-0.08)
SIZE	0.0037	-0.0632	-0.0022	-0.0428	0.0599**	-0.7712	0.0403*	0.6245
	(0.53)	(-0.38)	(-0.19)	(-0.39)	(2.34)	(-0.09)	(1.70)	(0.08)
MTB	0.0084**	-0.0180	-0.0100**	-0.0122	-0.0228***	-0.3633	-0.0087	0.1836
	(2.50)	(-0.20)	(-2.41)	(-0.81)	(-2.73)	(-0.10)	(-1.16)	(0.07)
LEV	0.0405**	0.3116	0.0867***	0.0920	0.1113*	-3.1146	0.0159	-2.8646
	(2.02)	(0.36)	(2.63)	(0.65)	(1.67)	(-0.09)	(0.27)	(-0.07)
NOA	-0.0042	-0.0012	-0.0059	-0.0067	-0.0055	0.0782	0.0007	0.2533
	(-1.13)	(-0.03)	(-0.98)	(-0.40)	(-0.49)	(0.08)	(0.08)	(0.08)
Observations	2,190	2,186	2,190	2,186	2,190	2,189	2,190	2,189
Adjusted R-squared	0.0345	0.0124	0.2647	0.0362	0.1140	0.00902	0.3182	0.0420
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	YES	NO	YES	NO
F-statistic	4.164	0.0761	25.22	0.716	7.341	0.0108	17.68	0.00503

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 33 : Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008 of Family Firms with Control Threshold at 10%

VARIABLES	(1) OLS AEM	(2) 2SLS AEM	(3) OLS DA	(4) 2SLS DA	(5) OLS REM	(6) 2SLS REM	(7) OLS REM	(8) 2SLS REM
Constant	-0.0075	0.2965	-0.0444	-0.0719	-0.8063**	31.6937	-0.4658	-0.7436
	(-0.08)	(0.19)	(-0.24)	(-0.20)	(-2.09)	(0.05)	(-1.27)	(-0.07)
AEM					0.2190	-186.7552		
					(1.58)	(-0.05)		
REM	0.0083	0.7443	0.3581***	-0.0026				
	(0.42)	(0.44)	(9.51)	(-0.00)				
DA							0.7103***	-14.1412
							(5.74)	(-0.19)
POST_REG	-0.0003	0.0209	0.0105	-0.0009	-0.0007	-5.4444	-0.0319	0.0195
	(-0.03)	(0.30)	(0.80)	(-0.02)	(-0.02)	(-0.05)	(-1.33)	(0.03)
INBD	0.0186	-0.1037	0.0262	-0.0151	-0.0847	5.9022	-0.0580	1.2950
	(0.50)	(-0.37)	(0.49)	(-0.11)	(-0.82)	(0.05)	(-0.62)	(0.18)
FAM_C10	-0.0087	-0.0452	-0.0142	-0.0171	-0.0068	-26.4555	-0.0129	-1.0042
	(-0.89)	(-0.68)	(-0.61)	(-1.13)	(-0.20)	(-0.05)	(-0.40)	(-0.14)
REM*POST_REG	-0.0172	-1.4211	-0.0827***	-0.1740				
	(-1.13)	(-1.25)	(-3.14)	(-1.14)				
REM*FAM_C10	-0.0061	-1.1033	0.0032	-0.2221				
	(-0.27)	(-0.74)	(0.07)	(-0.19)				
AEM*POST_REG					-0.5034***	82.2512		
					(-2.75)	(0.05)		
AEM*FAM_C10					-0.1555	305.7773		
					(-0.95)	(0.05)		
DA*POST_REG							0.4117***	60.9092
							(3.81)	(0.17)
DA*FAM_C10							-0.1810	-24.1160
							(-1.32)	(-0.11)
MTB	0.0086**	-0.0024	-0.0095**	0.0040	-0.0229***	-0.1106	-0.0090	-0.0039
	(2.55)	(-0.05)	(-2.28)	(0.53)	(-2.74)	(-0.04)	(-1.19)	(-0.01)
LEV	0.0408**	0.1614	0.0867**	0.0715**	0.1072	2.2640	0.0118	0.4839
	(2.06)	(0.61)	(2.57)	(2.30)	(1.59)	(0.06)	(0.20)	(0.15)
NOA	-0.0041	0.0002	-0.0056	-0.0044	-0.0061	0.7450	-0.0002	-0.0567
	(-1.11)	(0.01)	(-0.92)	(-0.55)	(-0.54)	(0.05)	(-0.02)	(-0.09)
Observations	2,190	2,186	2,190	2,186	2,190	2,189	2,190	2,189
Adjusted R-squared	0.0345	0.0119	0.2639	0.0226	0.1140	0.000110	0.3152	0.0376
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	YES	NO	YES	NO
F-statistic	4.023	1.194	24.87	3.605	7.252	0.00399	16.94	0.0238

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 34: Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 1999 of Top Five Ownership Concentration Levels

VARIABLES	(1) OLS AEM	(2) 2SLS AEM	(3) OLS DA	(4) 2SLS DA	(5) OLS REM	(6) 2SLS REM	(7) OLS REM	(8) 2SLS REM
Constant	-0.2236	-0.9536	-0.4964*	-0.4166	-0.4838	2.2108	-0.0825	0.1075
	(-1.17)	(-0.45)	(-1.91)	(-0.12)	(-1.20)	(0.16)	(-0.26)	(0.09)
AEM					-0.1439	0.4988		
					(-1.14)	(0.02)		
REM	0.0198	-1.4327	0.3731***	1.0293				
	(0.73)	(-0.46)	(10.13)	(0.15)				
DA							0.8393***	0.7798
							(9.58)	(0.97)
POST_REG	-0.0033	0.1004	-0.0314**	0.0533	0.0094	0.5827	0.0410**	0.0740
	(-0.35)	(0.52)	(-2.36)	(0.17)	(0.65)	(0.18)	(2.12)	(1.08)
INBD	0.0416	-0.1773	0.0431	-0.5990	0.0964	0.5786	0.0263	0.0171
	(0.88)	(-0.43)	(0.57)	(-0.71)	(0.98)	(0.20)	(0.26)	(0.11)
OWN_T5	0.0096	-0.0540	-0.0173	-0.1093	-0.0107	-1.0509	0.0003	0.0383
	(1.02)	(-0.24)	(-1.55)	(-0.79)	(-0.53)	(-0.25)	(0.02)	(0.66)
REM*POST_REG	-0.0018	-2.2435	-0.0134	-3.8752				
	(-0.08)	(-0.38)	(-0.40)	(-0.94)				
REM*OWN_T5	-0.0169	3.1552	-0.0426	5.5293				
	(-0.54)	(0.51)	(-0.85)	(0.52)				
AEM*POST_REG					0.1976	-7.4967		
					(1.44)	(-0.17)		
AEM*OWN_T5					0.0541	11.6677		
					(0.37)	(0.26)		
DA *POST_REG							-0.3655***	-0.1196
							(-3.85)	(-0.12)
DA*OWN_T5							-0.1765	1.6699
							(-1.62)	(0.92)
MTB	0.0065*	-0.0132	-0.0031	0.0223	-0.0150**	0.0062	-0.0101*	-0.0051
	(1.69)	(-0.28)	(-0.60)	(0.32)	(-2.45)	(0.12)	(-1.70)	(-0.46)
LEV	0.0057	0.1544	0.0178	0.2009	0.0134	0.2769	0.0033	-0.0457
	(0.19)	(0.43)	(0.40)	(0.61)	(0.24)	(0.22)	(0.06)	(-0.48)
NOA	-0.0005	0.0333	0.0049	0.0163	0.0154	0.0580	0.0107	0.0006
	(-0.11)	(0.45)	(0.58)	(0.13)	(1.23)	(0.28)	(0.84)	(0.02)
Observations	1,325	1,307	1,325	1,307	1,325	1,325	1,325	1,325
Adjusted R-squared	0.1002	0.0139	0.3094	0.0316	0.0467	0.0958	0.2344	0.182
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	NO	NO	YES	NO
F-statistic	6.183	0.371	24.92	1.021	4.032	0.318	11.12	1.939

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 35: Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 1999 of Top Ten Ownership Concentration Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
VARIABLES	AEM	AEM	DA	DA	REM	REM	REM	REM
Constant	-0.2215	-0.8791	-0.4801*	78.3805	-0.5066	-0.4816	-0.1467	1.5432
	(-1.16)	(-0.77)	(-1.85)	(0.01)	(-1.25)	(-0.35)	(-0.46)	(0.12)
AEM					-0.1564	-3.5611*		
					(-1.26)	(-1.71)		
REM	0.0157	-1.0235	0.3811***	127.7951				
	(0.59)	(-0.70)	(10.18)	(0.01)				
DA							0.7754***	0.4467
							(8.95)	(0.14)
POST_REG	-0.0023	0.0566	-0.0307**	-4.2826	0.0082	-0.1265	0.0341***	0.1660
	(-0.24)	(0.97)	(-2.28)	(-0.01)	(0.58)	(-0.31)	(3.14)	(0.17)
INBD	0.0422	-0.0789	0.0418	3.1352	0.0868	0.0207	0.0969	-0.2247
	(0.88)	(-0.41)	(0.55)	(0.01)	(0.90)	(0.09)	(1.13)	(-0.10)
OWN_T10	0.0003	0.0522	-0.0204*	-7.3038	0.0166	-0.1934	0.0233	0.1226
	(0.04)	(0.42)	(-1.73)	(-0.01)	(0.80)	(-0.41)	(1.43)	(0.18)
REM*POST_REG	-0.0078	-1.0478	-0.0129	3.0657				
	(-0.36)	(-0.37)	(-0.40)	(0.01)				
REM*OWN_T10	-0.0023	2.0777	-0.0529	-164.7822				
	(-0.07)	(0.79)	(-1.12)	(-0.01)				
AEM*POST_REG					0.2080	2.1593		
					(1.53)	(0.41)		
AEM*OWN_T10					0.0626	2.6722		
					(0.43)	(0.53)		
DA*POST_REG							-0.3355***	1.9944
							(-3.51)	(0.10)
DA*OWN_T10							-0.1604	4.9924
							(-1.53)	(0.14)
MTB	0.0062	-0.0037	-0.0032	0.6857	-0.0141**	-0.0044	-0.0084	-0.0063
	(1.62)	(-0.23)	(-0.62)	(0.01)	(-2.28)	(-0.42)	(-1.49)	(-0.25)
LEV	0.0050	0.1228	0.0180	-4.8525	0.0145	-0.0056	-0.0157	-0.0482
	(0.17)	(0.65)	(0.41)	(-0.01)	(0.26)	(-0.02)	(-0.29)	(-0.22)
NOA	-0.0006	0.0245	0.0050	-2.4039	0.0158	0.0175	0.0111	-0.0354
	(-0.15)	(0.78)	(0.60)	(-0.01)	(1.26)	(0.68)	(0.90)	(-0.10)
Observations	1,325	1,307	1,325	1,307	1,325	1,325	1,325	1,325
Adjusted R-squared	0.0987	0.000593	0.3102	0.0622	0.0484	0.0571	0.2121	0.113
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	NO	NO	YES	NO
F-statistic	6.290	0.972	25.43	0.00154	4.259	2.556	15.81	0.324

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 36: Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008 of Top Five Ownership Concentration Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
VARIABLES	AEM	AEM	DA	DA	REM	REM	REM	REM
Constant	0.0736	-2.8024	-0.0864	0.8127	-1.0401***	1.8149	-0.6682**	-6.9330
	(0.89)	(-0.23)	(-0.58)	(0.74)	(-3.29)	(0.35)	(-2.31)	(-0.10)
AEM					0.1473	-1.0849		
					(1.42)	(-0.16)		
REM	0.0128	0.5945	0.3494***	1.5355				
	(0.73)	(0.07)	(14.08)	(0.44)				
DA							0.6176***	-11.7688
							(11.14)	(-0.07)
POST_REG	0.0068	0.0492	0.0154	-0.0124	-0.0156	-1.6738	-0.0396*	-0.0925
	(0.72)	(0.18)	(1.22)	(-0.28)	(-0.55)	(-0.43)	(-1.73)	(-0.07)
INBD	-0.0370	-0.1294	-0.0245	-0.0282	-0.0557	1.3664	-0.0019	-5.0984
	(-1.06)	(-0.21)	(-0.49)	(-0.32)	(-0.58)	(0.46)	(-0.02)	(-0.09)
OWN_T5	0.0143*	0.0881	-0.0271**	-0.0427	0.0510**	-1.2944	0.0541***	0.0897
	(1.91)	(0.23)	(-2.42)	(-0.42)	(2.55)	(-0.66)	(3.17)	(0.10)
REM*POST_REG	-0.0080	-6.3603	-0.0641***	-0.0604				
	(-0.57)	(-0.24)	(-2.70)	(-0.12)				
REM*OWN_T5	-0.0093	-1.7876	0.0022	-1.0253				
	(-0.45)	(-0.16)	(0.07)	(-0.15)				
AEM*POST_REG					-0.2923*	19.1564		
					(-1.74)	(0.41)		
AEM*OWN_T5					-0.0804	14.0537		
					(-0.54)	(0.70)		
DA*POST_REG							0.3299***	-45.8071
							(3.45)	(-0.10)
DA*OWN_T5							-0.0436	94.7960
							(-0.42)	(0.09)
ROA	-0.0646*	-1.9116	0.7683***	1.1793***	-0.6134***	-1.9989	-1.0355***	-2.5811
	(-1.70)	(-0.26)	(13.43)	(3.41)	(-5.90)	(-0.71)	(-10.60)	(-0.18)
SIZE	-0.0004	0.1920	0.0035	-0.0574	0.0725***	-0.1106	0.0485**	0.6676
	(-0.07)	(0.24)	(0.35)	(-0.63)	(3.43)	(-0.30)	(2.51)	(0.10)
MTB	0.0088***	-0.0867	-0.0036	0.0215	-0.0223***	-0.0540	-0.0138*	-0.1920
	(3.06)	(-0.24)	(-0.90)	(0.25)	(-2.86)	(-0.49)	(-1.87)	(-0.09)
LEV	0.0189	0.4773	0.0336	0.0451	0.0411	-0.5141	0.0086	-2.0911
	(1.09)	(0.24)	(1.11)	(0.10)	(0.72)	(-0.50)	(0.18)	(-0.09)
NOA	-0.0037	-0.0125	-0.0037	-0.0149	0.0015	0.0048	0.0036	0.3320
	(-1.38)	(-0.16)	(-0.78)	(-0.18)	(0.17)	(0.09)	(0.46)	(0.09)
Observations	2,860	2,626	2,860	2,626	2,860	2,859	2,860	2,859
Adjusted R-squared	0.0385	0.00217	0.2830	0.239	0.0859	0.0115	0.2912	6.25e-06
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	YES	NO	YES	NO
F-statistic	5.012	0.0232	24.93	3.121	5.719	0.263	19.50	0.0116

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Table 37:Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008 of Top Ten Ownership Concentration Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
VARIABLES	AEM	AEM	DA	DA	REM	REM	REM	REM
Constant	0.0744	-0.8158	-0.1017	0.7044	-1.0263***	2.6744	-0.5584**	-1.6026
	(0.90)	(-0.13)	(-0.68)	(1.32)	(-3.21)	(0.52)	(-2.21)	(-0.37)
AEM					0.1405	-5.4527		
					(1.36)	(-0.93)		
REM	0.0089	1.6007	0.3431***	1.0234**				
	(0.52)	(0.18)	(14.46)	(2.01)				
DA							0.6349***	1.2244
							(10.96)	(0.09)
POST_REG	0.0067	0.0195	0.0147	-0.0077	-0.0146	-1.5594	0.0099	-0.0669
	(0.71)	(0.12)	(1.15)	(-0.68)	(-0.51)	(-0.67)	(0.93)	(-0.21)
INBD	-0.0381	-0.0772	-0.0233	-0.0278	-0.0580	1.2159	-0.0029	-0.9936
	(-1.09)	(-0.23)	(-0.47)	(-0.37)	(-0.61)	(0.55)	(-0.04)	(-0.32)
OWN_T10	0.0126*	-0.0431	-0.0105	-0.0311	0.0319*	-1.2390	0.0251	0.1227
	(1.67)	(-0.15)	(-1.19)	(-1.16)	(1.69)	(-0.63)	(1.55)	(0.39)
POST_REG_REM	-0.0082	-4.6808	-0.0630***	-0.1011				
	(-0.57)	(-0.39)	(-2.68)	(-0.51)				
REM*OWN _T10	0.0008	-1.6363	0.0134	0.0485				
	(0.04)	(-0.23)	(0.40)	(0.09)				
AEM*POST_REG					-0.3016*	21.1753		
					(-1.81)	(0.65)		
AEM*OWN_T10					-0.0535	13.4064		
					(-0.36)	(0.67)		
DA*POST_REG							0.3204***	-12.7449
							(3.48)	(-0.51)
DA*OWN_T10							-0.0974	18.2737
							(-0.98)	(0.27)
ROA	-0.0648*	-0.7163	0.7674***	1.1690***	-0.6144***	-2.3304	-1.0031***	-2.2187
	(-1.71)	(-0.21)	(13.40)	(4.18)	(-5.88)	(-1.01)	(-10.15)	(-0.95)
SIZE	-0.0004	0.0605	0.0040	-0.0480	0.0721***	-0.1438	0.0382**	0.1508
	(-0.07)	(0.14)	(0.40)	(-1.34)	(3.38)	(-0.44)	(2.29)	(0.38)
MTB	0.0089***	-0.0339	-0.0040	0.0085	-0.0218***	-0.0157	-0.0062	-0.0109
	(3.08)	(-0.19)	(-1.00)	(0.64)	(-2.77)	(-0.25)	(-0.90)	(-0.14)
LEV	0.0194	0.2694	0.0323	-0.0295	0.0438	-0.5865	0.0261	-0.4312
	(1.12)	(0.33)	(1.07)	(-0.44)	(0.76)	(-0.51)	(0.55)	(-0.31)
NOA	-0.0039	0.0001	-0.0032	-0.0009	0.0006	-0.0165	0.0058	0.0421
	(-1.47)	(0.00)	(-0.66)	(-0.10)	(0.07)	(-0.35)	(0.76)	(0.32)
Observations	2,860	2,626	2,860	2,626	2,860	2,859	2,860	2,859
Adjusted R-squared	0.0381	0.7329	0.2812	0.240	0.0840	0.00440	0.2783	0.00355
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	NO	NO	YES	NO
F-statistic	4.988	0.0450	22.86	4.491	5.794	0.455	32.83	0.270

Note: Variable definitions are given in Table 6 and Table 19
Robust t-statistics in parentheses
***, **, and * are coefficients significant at the .01, .05, and .1 level, respectively

Chapter 5: Additional Tests

5.1 Suspect Firms Analysis

Previous studies have provided evidence that firms strategically use both AEM and REM in order to avoid reporting loss (Cohen et al., 2008; Roychowdhury, 2006; Zang, 2012). To increase the power of my tests, following (Cohen et al., 2008; Roychowdhury, 2006; Zang, 2012) I conduct additional tests forming suspect firm's subsample of earnings benchmarks to investigate how the earnings management strategies of firms likely to meet these benchmarks have changed in the post-reform compared to pre-reform period for both the distinct regulatory events.

I form three subsamples of earnings benchmarks following (Cohen et al., 2008; Roychowdhury, 2006; Zang, 2012). The first sample includes suspect firms that has managed their earnings reporting income just marginally above zero to avoid reporting loss. Studies shows firms that manage earnings to report income marginally above zero are those with firm-years in the interval just right of zero. These firms are identified as firm-year observations with net income before extraordinary items scaled by total assets in the interval of 0 to 0.005. Here, firm-years is calculated as total number of firms multiplied by sample period and total number of variable and finally deducting number of missing observations.

The second sample investigates suspect firms that manage earnings to meet/beat prior year's earnings numbers. Here the firms are identified as firm-years with change in net income before extraordinary items scaled by total assets lies in the interval of 0 to 0.005.

Previous studies suggest that firms consider analysts forecasts as an important earnings benchmark which incentivizes managers to manipulate earnings to meet/beat analyst forecast. The third sample follows Cohen et al. (2008); Roychowdhury (2006) examining AEM and REM of firms meeting/beating analyst's (consensus) forecasts outstanding prior to earnings announcement date. The final consensus forecast can be considered as the ex-post for what managers expects the final consensus to be since analyst revises forecast throughout the year until before the earnings announcement

which makes forecasts a moving target as it cannot be observed which target managers considers as target they need to meet/beat. Accordingly, I define forecasting error as actual earnings per share (EPS) minus consensus forecast of earnings per share (EPS)8. In their study, Cohen et al. (2008) defined forecasting error as \$0.00 ≤ Forecasting error ≤ \$0.01 (one cent per share or less is considered). However, I widen the forecasting error as THB 0.00 ≤ Forecasting error ≤ THB 1 since the number of observations with the range starting from 0 as 1% of THB 1 (0.01) is not sufficient to perform statistical test.

I define dummy variable SUSPECT_FE which takes the value of 1 if the observation is within the to be defined forecasting error range otherwise 0. Accordingly, I run welch t-test to difference in means and significance of the level of earnings management strategies which are AEM, DA and REM over the cross-over period (pre and post period).

5.2 Results

The robustness test for firms reporting their earnings marginally above zero and firms that manage earnings to meet/beat prior year's earnings could not be tested due to lower turnout of firm-year observations. The number of observations that falls under the suspect firm identification interval of 0 to 0.005 estimated by net income before extraordinary income scaled by total assets for subsample of firms reporting earnings marginally above zero is not sufficient to run statistical analysis. Subsequently, firm-year observation for subsample of firms that meet/beat prior year's earnings which are identified through change in net income before extraordinary items scaled by total assets in the interval 0 to 0.005 are not sufficient to run statistical tests.

Table 38 and 39 demonstrate results of difference in means of earnings management proxies pre-and post-period of regulatory event in 1999 and 2008 respectively. The difference in means for both events in 1999 and 2008 is not significant. However, the results could be insignificant due to the lower number of

[8] I obtain analyst consensus forecast from the I/B/E/S

observations. Thai firms are not widely covered by analysts globally unlike firms in a western setting which primarily constrained number of observations used in the test. Additionally, the lower number of observations also constrained in defining a robust forecasting error for the sample.

Table 38: Descriptive Statistics and Cross-Over Difference in Means in Earnings Management Proxies of Regulatory Event in 1999 for Suspect Firms

		(A) Pre-Period	(B) Post-Period	Difference (A-B)
AEM	Mean	0.090	0.118	-0.028
	SD	0.069	0.100	(0.165)
	N	79	30	
DA	Mean	-0.006	0.035	-0.041
	SD	0.114	0.176	(0.241)
	N	79	30	
REM	Mean	-0.029	0.070	-0.099
	SD	0.201	0.311	(0.116)
	N	74	30	

Table 39: Descriptive Statistics and Cross-Over Difference in Means in Earnings Management Proxies of Regulatory Event in 2008 for Suspect Firms

		(A) Pre-Period	(B) Post-Period	Difference (A-B)
AEM	Mean	0.086	0.097	-0.011
	SD	0.085	0.098	(0.321)
	N	233	114	
DA	Mean	0.005	-0.003	0.007
	SD	0.148	0.144	(0.658)
	N	233	114	
REM	Mean	-0.009	0.022	-0.032
	SD	0.277	0.292	(0.331)
	N	232	115	

Chapter 6: Conclusion

This study takes advantage of two key corporate governance regulatory regime changes in Thailand to investigate earnings management behavior of publicly listed Thai firms. The first regulatory event in 1999 mandated audit committee independence and the second regulatory event in 2008 was more rigorous in nature which altered board composition by mandating proportionate level of independent directors relative to the board size.

In line with the objectives of the regulatory regime changes in 1999 and 2008 which was to instate board independence, this study hypotheses lower degree of accruals and real earnings management by Thai firms in post-period when the regulatory mandates came into effect. Furthermore, this paper also investigated as part of the key contribution whether firms substituted between both earnings management strategies.

Since Thai firms are largely family owned with high ownership concentration, as part of sub analysis I also investigate earnings management behavior and its substitution of Thai family firms following both the regulatory regime change. Additionally, I use ownership concentration data to provide evidence on earnings management in the presence of high ownership concentration of both family and institutional ownership.

In univariate test on three different firm groups – AIC, GIC and Others, I find that GIC firms manipulated earnings through accruals during the pre-period of 1999 event. In contrast, I find that while during the pre-period of 2008 regulatory event AIC, GIC and Other firms groups manipulated earnings through AEM but AIC firms manipulated earnings through REM in the post-period which indicates substitution between AEM and REM. In robustness, difference in difference estimation results indicates the regulatory regime change in 1999 led to higher degree of accrual earnings management.

Subsequent regressions analysis provides evidence that post regulatory regime change in 2008 firms had lower degree of earnings manipulation through REM. This indicates that in the presence of proportionate level of independent directors on Thai relative to the board size in Thai firms, observatory and scrutiny of financial statements increased leading to lower level of REM. I find similar results of lower degree of REM post regulatory event in 2008 for ownership classification categories sample with family ownership threshold control at 10%. The results indicate that regulatory regime change in 2008 which mandated one-third of boards in Thai firms to be independent, had a higher degree of influence in constraining real earnings management compared to the regulatory mandate passed in 1999.

The results for top ten and top five ownership concentration sample however indicates positive association of real earnings management manipulation post regulatory event in 2008.

The result for ROA that is dominant across most samples provides evidence that good firm performance in Thai firms is associated with higher accruals and lower real earnings management.

Investigating earnings management substitution and basing results on 2SLS method, I find that post both regulatory event in 1999 and 2008 firms used REM and DA jointly and simultaneously indicating a complementary relationship. Investigating whether the complementary relationship is largely due to negative or positive discretionary accruals, I find that for regulatory event in 1999 sample artifacts suggests usage of negative accruals might have dominated the results. However, regression results for sample of regulatory event in 2008 confirms negative discretionary accruals largely dominated in complementary relationship between real earnings management and accruals earnings management.

I find similar evidence of complementary relationship between REM and DA for family firms with control threshold level at 25% following regulatory event in 1999.

The complementary relationship between accruals and real earnings management also holds true for post regulatory regime change in 2008 for top ten ownership concentration sample.

This paper makes several contributions to the earning management and corporate governance literature. First, to the best of my knowledge no prior study has investigated earnings management substitution surrounding the two distinct regulatory events in 1999 and 2008. Given the regulatory mandates passed in 1999 and 2008 were different in kind, this allowed to see how the two regulatory mandates had effect on the level of earning management. This paper is primarily motivated by the work done by Cohen et al. (2008), where the authors provided evidence of earnings management substitution surrounding the Sarbanes-Oxley Act (SOX). However, SOX was passed along with several different regulatory mandates which added noise to the effect of board independence on earnings management. This study complements this gap by taking advantage of the regulatory mandates passed by Thai regulatory boards which solely was focused on board independence. The most important contribution this paper made is providing evidence of complementary relationship between accruals based and real earnings management where Thai firms jointly and simultaneously us both earnings management tools rather than substituting. The complementary relationship is emerging topic in earnings management and to the best of my knowledge prior study by Chen et al. (2012) and Sarra et al. (2019) only provided evidence of such relationship.

Likewise other studies, this paper also has several limitations. Future research could run robust tests to classify the dominating direction of discretionary accruals (DA) and real earnings management, whether the positive or negative relation result in the complementary relationship between accruals and real earnings management. Due to time limitations this study excluded control for Big 4 auditors which prior research showed are able to constrain earning management undertaken by firms to a greater degree. In this study, I use family as an ownership classification reference only. However, further research could use high family versus low family ownership to investigate how the degree of earning management and its substitution differs.

Additionally, evidence provide by Boonlert-U-Thai et al. (2019) that founding family (first generation) report higher earnings quality, future studies could see how the degree of earnings management and its substitution among founder family firms versus second and third generation controlling the firm.

Appendix

Figure3: Timeline of the Thai Regulatory Events by SET and SEC (Prachyangprecha, 2013)

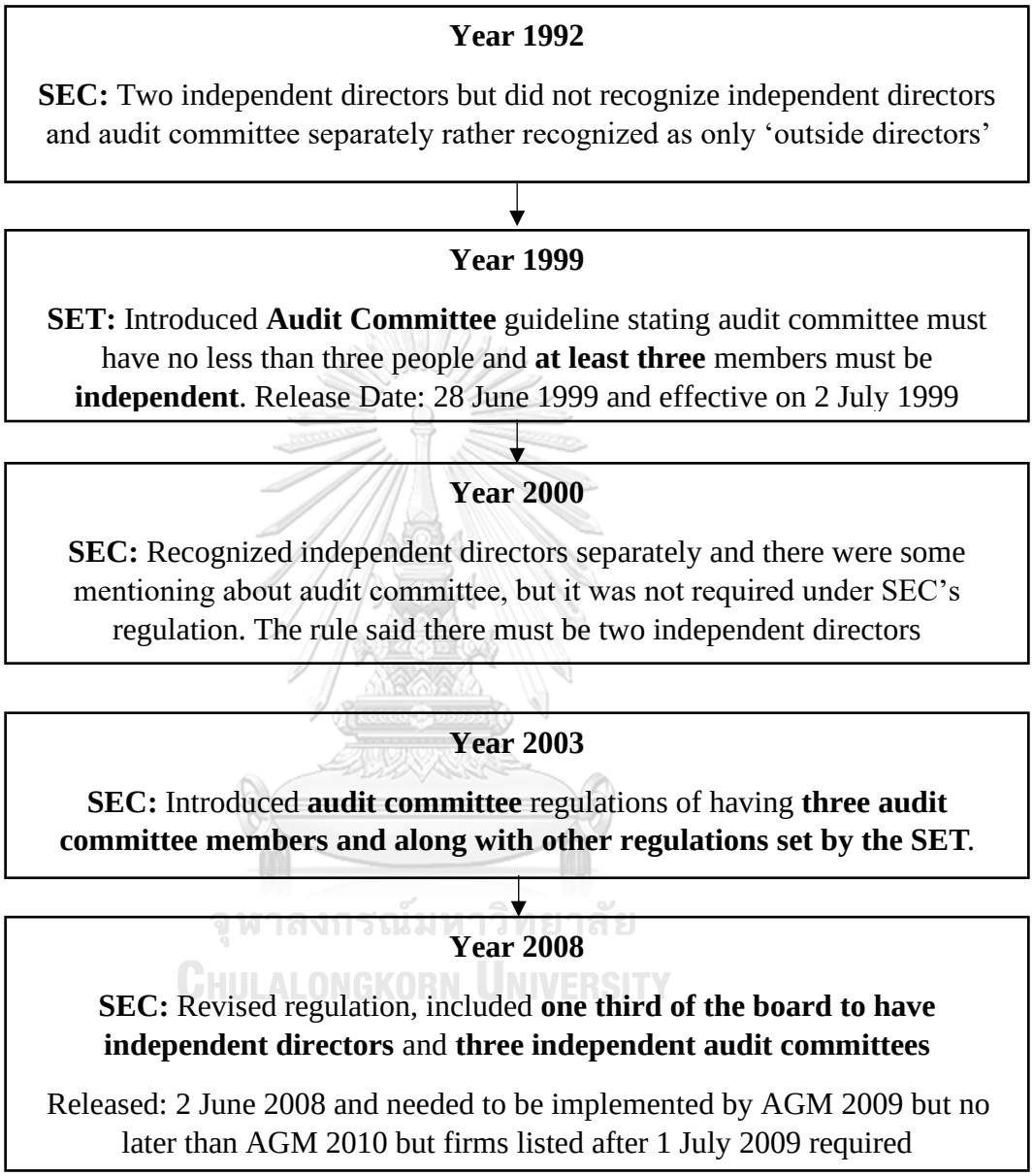


Table 40: First Stage Regression Results for Association between Earnings Substitution and Regulatory Regime Change in 1999

	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS	(8) OLS	(9) OLS	(10) OLS	(11) OLS	(12) OLS	(13) OLS	(14) OLS	(15) OLS	(16) OLS
VARIABLES	REM	POSTREG*REM	REM	POST_REG*REM	REM	POST_REG*REM	REM	POST_REG*REM	AEM	POST_REG*AEM	DA	POST_REG*DA	POSTIVE_DA	POST_REG*POSTIVE_DA	NEGATIVE_DA	POST_REG*POSTIVE_DA
Constant	-0.4691	-0.0616	-0.4727	-0.1223	-1.5330***	-0.9413*	0.3209	0.7455	-0.3737**	-0.1633	-1.0880***	-1.0343***	-0.8096***	-0.5283***	0.2556	-0.0552
	(-1.14)	(-0.15)	(-1.15)	(-0.30)	(-2.67)	(-1.71)	(0.65)	(1.41)	(-2.21)	(-1.10)	(-3.29)	(-3.12)	(-3.04)	(-2.32)	(0.69)	(-0.16)
AEM_{t-1}	0.0063															
	(0.11)															
DA_{t-1}			0.0059													
			(0.16)													
$POSITIVE\_DA_{t-1}$					-0.0082											
					(-0.11)											
$NEGATIVE\_DA_{t-1}$							-0.0556									
							(-0.98)									
POST_REG	0.0288	0.0067	0.0292	0.0085	0.0421***	0.0254	0.0066	-0.0243	-0.0036	0.0673***	-0.0263*	-0.0282*	-0.0238	0.0640***	-0.0022	-0.0843***
	(1.31)	(0.35)	(1.35)	(0.46)	(2.76)	(1.19)	(0.31)	(-0.93)	(-0.39)	(6.77)	(-1.84)	(-1.70)	(-1.43)	(8.03)	(-0.13)	(-3.71)
$POST\_REG*AEM_{t-1}$		0.0112														
		(0.12)														
$POST\_REG*DA_{t-1}$				0.1194**												
				(2.29)												
POST_REG*POSITIVE_DA$_{t-1}$						0.1414										
						(1.28)										
POST_REG*Negative_DA$_{t-1}$								0.0586								
								(0.69)								
C_PROD									0.0002		0.0249***		0.0134**		-0.0047	
									(0.05)		(2.69)		(2.22)		(-0.35)	
POST_REG*AEM																
POST_REG*C_PROD										0.0009		0.0092		0.0019		-0.0036
										(0.25)		(1.39)		(0.52)		(-0.32)
INBD	0.0343	0.0534	0.0348	0.0553	0.0031	0.1530	0.2893	0.0703	0.0587	0.0096	0.0280	0.0778	0.0619	0.0555	0.0087	0.1715*
	(0.30)	(0.54)	(0.30)	(0.56)	(0.03)	(1.27)	(1.65)	(0.33)	(1.21)	(0.24)	(0.35)	(1.15)	(0.77)	(1.25)	(0.09)	(1.79)
ROA	-0.3078***	-0.1868***	-0.3061***	-0.1763***	-0.0154	-0.0731	-0.3778***	-0.2223***	-0.1542***	-0.0073	0.7149***	0.2148***	0.3314***	0.1188**	0.4569***	0.1347**
	(-3.81)	(-3.35)	(-3.82)	(-3.28)	(-0.16)	(-0.91)	(-3.86)	(-3.01)	(-3.89)	(-0.28)	(12.28)	(3.22)	(4.08)	(2.21)	(6.95)	(2.22)
SIZE	0.0286	0.0007	0.0288	0.0041	0.0937**	0.0527	-0.0287	-0.0529	0.0288**	0.0096	0.0685***	0.0672***	0.0539***	0.0323**	-0.0261	0.0002
	(1.08)	(0.03)	(1.09)	(0.16)	(2.52)	(1.48)	(-0.89)	(-1.53)	(2.51)	(0.96)	(3.11)	(3.06)	(3.08)	(2.15)	(-1.02)	(0.01)
MTB	-0.0176**	-0.0043	-0.0175**	-0.0027	-0.0125	-0.0041	-0.0148*	-0.0021	0.0049	0.0022	-0.0072	0.0009	0.0078	0.0064	-0.0035	0.0040
	(-2.56)	(-0.57)	(-2.54)	(-0.35)	(-1.38)	(-0.42)	(-1.74)	(-0.18)	(1.39)	(0.78)	(-1.16)	(0.16)	(1.30)	(1.42)	(-0.61)	(0.77)
LEV	0.0342	0.0548	0.0357	0.0658	0.1771**	0.1586**	-0.1048	-0.0255	-0.0029	0.0345	0.0242	-0.0128	0.0555	0.0467*	0.0584	-0.0432
	(0.58)	(0.91)	(0.61)	(1.12)	(2.30)	(2.00)	(-1.45)	(-0.35)	(-0.11)	(1.35)	(0.55)	(-0.27)	(1.43)	(1.66)	(1.38)	(-0.91)
NOA	0.0162	0.0065	0.0163	0.0079	0.0236**	0.0170**	0.0469***	0.0251*	-0.0006	0.0001	-0.0034	0.0007	-0.0049	-0.0012	0.0168	0.0158*
	(1.26)	(0.55)	(1.28)	(0.74)	(2.54)	(2.09)	(3.27)	(1.77)	(-0.15)	(0.02)	(-0.50)	(0.14)	(-0.93)	(-0.28)	(1.62)	(1.65)
Observations	1,318	1,318	1,318	1,318	635	635	683	683	1,473	1,473	1,473	1,473	705	705	768	768
Adjusted R-squared	0.0496	0.0142	0.0496	0.0226	0.0629	0.0479	0.0936	0.0418	0.0955	0.3134	0.1884	0.0540	0.1201	0.2747	0.1825	0.2510
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES	NO	YES	YES
F-statistic	3.319	2.395	3.310	3.159	2.714	1.890	4.919	2.278	6.856	28.50	16.59	2.515	4.540	27.11	6.146	9.687

Table 41: First Stage Regression Results for Association between Earnings Substitution and Regulatory Regime Change in 2008

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
VARIABLES	REM	POST_REG*REM	REM	POST_REG*REM	REM	POST_REG*REM	REM	POST_REG*REM	AEM	POST_REG*AEM	DA	POST_REG*DA	P0SITIVE_DA	POST_REG*POSITIVE_DA	NEGATIVE_DA	POST_REG*NEGATIVE_DA
Constant	-1.0381***	-0.4211	-1.0709***	-0.3504	-0.4979	-0.3871	-1.3212***	-0.3372	0.1074	-0.1016*	-0.5566***	-0.2659***	-0.1017	-0.2079	-0.4487**	-0.2755**
	(-2.87)	(-1.34)	(-2.91)	(-1.15)	(-1.26)	(-1.00)	(-2.78)	(-0.73)	(1.22)	(-1.65)	(-3.59)	(-3.19)	(-0.69)	(-1.63)	(-2.35)	(-2.05)
AEM_{t-1}	-0.0143															
	(-0.22)															
DA_{t-1}			-0.0672*													
			(-1.81)													
$POSITIVE\_DA_{t-1}$					-0.0604											
$NEGATIVE\_DA_{t-1}$							-0.1390*									
							(-1.82)									
POST_REG	-0.0184	0.0137	-0.0197	0.0138	0.0253	0.0616***	0.0139	-0.0703*	0.0072	0.0835***	-0.0001	-0.0095	0.0075	0.0763***	-0.0136	-0.0970***
	(-0.71)	(0.68)	(-0.75)	(0.70)	(1.34)	(2.60)	(0.76)	(-1.72)	(0.77)	(11.09)	(-0.01)	(-1.38)	(0.44)	(5.67)	(-0.77)	(-9.93)
POST_REG* AEM_{t-1}		-0.0116														
		(-0.08)														
POST_REG* DA_{t-1}				0.1831*												
				(1.90)												
POST_REG* $POSITIVE\_DA_{t-1}$						0.1022										
						(0.70)										
POST_REG* $NEGATIVE\_DA_{t-1}$								0.1391								
								(0.52)								
C_PROD									-0.0018		0.0220***		0.0007		0.0112	
									(-0.44)		(3.61)		(0.11)		(1.12)	
POST_REG*AEM																
POST_REG*C_PROD										-0.0016		0.0097***		-0.0030		0.0119***
										(-0.50)		(2.38)		(-0.68)		(3.19)
INBD	-0.0118	-0.0095	-0.0195	0.0023	-0.0097	0.0901	0.0503	-0.0477	-0.0352	-0.0553**	-0.0297	-0.0442*	-0.0590	-0.1227**	0.0162	0.0259
	(-0.12)	(-0.12)	(-0.20)	(0.03)	(-0.07)	(0.86)	(0.47)	(-0.43)	(-1.00)	(-2.57)	(-0.51)	(-1.73)	(-0.78)	(-2.45)	(0.27)	(1.29)
ROA	-0.6353***	-0.2662***	-0.6369***	-0.2575***	-0.3368**	-0.0322	-0.7474***	-0.4371***	-0.0705*	0.0475**	0.5795***	0.1705***	0.3261***	0.0679	0.2994***	-0.0913***
	(-5.65)	(-2.96)	(-5.62)	(-2.88)	(-2.36)	(-0.31)	(-5.79)	(-3.23)	(-1.82)	(2.00)	(9.66)	(4.20)	(4.52)	(1.45)	(3.78)	(-2.69)
SIZE	0.0730***	0.0290	0.0755***	0.0238	0.0324	0.0209	0.0874***	0.0288	-0.0020	0.0074*	0.0337***	0.0185***	0.0104	0.0175**	0.0228*	0.0191**
	(3.00)	(1.32)	(3.06)	(1.13)	(1.24)	(0.81)	(2.77)	(0.90)	(-0.35)	(1.77)	(3.29)	(3.26)	(1.04)	(2.08)	(1.77)	(2.02)
MTB	-0.0263***	-0.0175*	-0.0266***	-0.0177*	-0.0200	-0.0324***	-0.0212*	-0.0110	0.0091***	0.0017	-0.0085**	-0.0053**	0.0059	0.0055	-0.0123**	0.0017
	(-2.78)	(-1.82)	(-2.81)	(-1.85)	(-1.38)	(-2.84)	(-1.85)	(-0.75)	(3.24)	(0.97)	(-2.07)	(-2.28)	(1.21)	(1.43)	(-2.46)	(0.58)
LEV	0.0542	0.0480	0.0479	0.0618	0.1895**	0.1639**	-0.0340	-0.0581	0.0173	0.0116	0.0486	0.0115	0.0366	-0.0576*	0.0265	-0.0676**
	(0.83)	(0.69)	(0.73)	(0.91)	(2.13)	(2.16)	(-0.37)	(-0.59)	(1.01)	(1.09)	(1.46)	(0.73)	(1.03)	(-1.95)	(0.53)	(-2.58)
NOA	-0.0052	0.0018	-0.0041	-0.0003	0.0049	0.0043	0.0044	0.0033	-0.0043	-0.0001	-0.0102*	-0.0031	-0.0048	-0.0031	0.0008	0.0075*
	(-0.58)	(0.25)	(-0.46)	(-0.05)	(0.48)	(0.45)	(0.21)	(0.28)	(-1.48)	(-0.06)	(-1.91)	(-1.15)	(-0.87)	(-0.77)	(0.13)	(1.96)
Observations	2,652	2,652	2,652	2,652	1,275	1,275	1,377	1,377	2,910	2,910	2,910	2,910	1,392	1,270	1,518	1,371
Adjusted R-squared	0.0817	0.0245	0.0841	0.0310	0.0442	0.0659	0.1114	0.0515	0.0375	0.4043	0.0842	0.0484	0.0764	0.3440	0.0634	0.3899
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	NO	YES	NO	NO	NO	NO	NO	YES	YES	YES	NO	YES	YES	YES	NO
F-statistic	4.547	3.610	4.493	3.832	3.380	3.804	8.130	1.956	5.708	31.72	8.481	5.369	5.069	23.14	3.266	31.03

Table 42: First Stage Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 1999 of Family Firms with Control Threshold at 25%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
VARIABLES	REM	POST_REG*REM	REM*FAM_C25	REM	POST_REG*REM	REM*FAM_C25	AEM	POST_REG*AEM	AEM*FAM_C25	DA	POST_REG*DA	DA*FAM_C25
Constant	-0.4030	-0.1294	0.0652	-0.4076	-0.1947	0.0760	-0.4479**	-0.2220	-0.1878**	-1.1318***	-1.0765***	-0.1137
	(-0.88)	(-0.28)	(0.22)	(-0.90)	(-0.43)	(0.26)	(-2.50)	(-1.39)	(-2.05)	(-3.09)	(-2.96)	(-0.74)
AEM_{t-1}	0.0016											
	(0.02)											
DA_{T-1}				0.0070								
				(0.15)								
POST_REG	0.0240	0.0261	0.0188	0.0242	0.0285	0.0181	0.0014	0.0790***		-0.0369**	-0.0356**	
	(0.95)	(0.87)	(0.96)	(0.98)	(1.00)	(0.93)	(0.14)	(9.02)		(-2.52)	(-2.00)	
POST_REG* AEM_{t-1}		0.0007										
		(0.01)										
POST_REG* DA_{T-1}					0.1243**							
					(2.08)							
C_PROD							-0.0009			0.0341***		
							(-0.14)			(2.82)		
POST_REG* C_PROD								-0.0024			0.0107	
								(-0.62)			(1.56)	
INBD	0.0020	-0.0307	-0.0484	0.0022	-0.0335	-0.0469	0.0515	0.0080	-0.0133	0.0721	0.1233*	
	(0.02)	(-0.20)	(-0.49)	(0.02)	(-0.21)	(-0.47)	(1.07)	(0.26)	(-0.41)	(0.91)	(1.74)	
FAM_C25	-0.0324	-0.0433	-0.0285	-0.0323	-0.0429	-0.0306	-0.0021	-0.0118	0.0810***	0.0151	0.0135	
	(-1.44)	(-1.61)	(-0.95)	(-1.43)	(-1.64)	(-1.06)	(-0.18)	(-1.23)	(7.28)	(0.98)	(1.03)	
AEMt-1*FAMC25			-0.0199									
			(-0.19)									
DA*FAMC25						-0.0248						
						(-0.39)						
REM*FAM_C25									0.0029			0.0238***
									(0.72)			(3.57)
ROA	-0.4044***	-0.3020***	-0.2584***	-0.4028***	-0.2875***	-0.2612***	-0.1383***	0.0055	-0.0721*	0.7113***	0.2677***	
	(-3.56)	(-3.55)	(-3.02)	(-3.61)	(-3.53)	(-3.05)	(-2.65)	(0.15)	(-1.96)	(9.09)	(2.87)	
SIZE	0.0296	0.0097	-0.0014	0.0299	0.0134	-0.0020	0.0338***	0.0146	0.0120*	0.0713***	0.0698***	
	(1.00)	(0.32)	(-0.07)	(1.01)	(0.45)	(-0.11)	(2.78)	(1.36)	(1.91)	(2.93)	(2.90)	
MTB	-0.0249***	-0.0090	-0.0107	-0.0248***	-0.0079	-0.0109	0.0052	-0.0008	0.0034	-0.0117	-0.0033	
	(-2.98)	(-0.84)	(-1.60)	(-2.95)	(-0.75)	(-1.61)	(1.22)	(-0.25)	(1.30)	(-1.64)	(-0.48)	
LEV	0.0125	0.0535	-0.0577	0.0135	0.0645	-0.0595	-0.0118	0.0275	-0.0030	0.0133	-0.0233	
	(0.18)	(0.70)	(-0.99)	(0.19)	(0.86)	(-1.03)	(-0.40)	(0.93)	(-0.16)	(0.28)	(-0.41)	
NOA	0.0106	0.0018	0.0145***	0.0106	0.0038	0.0146***	0.0022	-0.0006	-0.0025	-0.0060	0.0020	
	(0.63)	(0.11)	(2.89)	(0.64)	(0.25)	(2.92)	(0.50)	(-0.17)	(-1.10)	(-0.71)	(0.30)	
Observations	1,027	1,027	1,027	1,027	1,027	1,027	1,153	1,153	1,153	1,153	1,153	1,153
Adjusted R-squared	0.0624	0.0229	0.0399	0.0625	0.0316	0.0402	0.0798	0.2854	0.2059	0.1758	0.0573	0.0679
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
F-statistic	3.012	1.608	2.085	3.064	1.876	2.055	4.823	30.30	13.47	10.85	2.012	4.637

Table 43: First Stage Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 1999 of Family Firms with Control Threshold at 10%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
VARIABLES	REM	POST_REG*REM	REM*FAM_C10	REM	POST_REG*REM	REM*FAM_C10	AEM	POST_REG*AEM	AEM*FAM_C10	DA	POST_REG*DA	DA*FAM_C10
Constant	-0.3829	-0.1166	-0.0620	-0.3863	-0.1815	-0.0767	-0.4428**	-0.2155	-0.2391**	-1.1450***	-1.0903***	-0.2425
	(-0.83)	(-0.25)	(-0.18)	(-0.84)	(-0.40)	(-0.22)	(-2.46)	(-1.35)	(-2.10)	(-3.12)	(-2.97)	(-1.35)
POST_REG	0.0225	0.0272	0.0269	0.0227	0.0288	0.0270	0.0008	0.0789***	0.0093	-0.0359**	-0.0350*	-0.0373***
	(0.89)	(0.91)	(1.29)	(0.91)	(1.01)	(1.30)	(0.08)	(9.12)	(1.18)	(-2.44)	(-1.94)	(-3.48)
INBD	0.0116	-0.0289	-0.0475	0.0120	-0.0314	-0.0491	0.0552	0.0117	0.0046	0.0654	0.1140	0.0379
	(0.10)	(-0.18)	(-0.51)	(0.10)	(-0.20)	(-0.52)	(1.14)	(0.37)	(0.12)	(0.81)	(1.56)	(0.69)
FAM_C10	-0.0272	-0.0069	0.0024	-0.0272	-0.0071	0.0052	-0.0104	-0.0154	0.0691***	0.0203	0.0258	-0.0279*
	(-1.17)	(-0.29)	(0.08)	(-1.18)	(-0.30)	(0.19)	(-1.02)	(-1.65)	(6.83)	(1.14)	(1.60)	(-1.75)
ROA	-0.3957***	-0.2951***	-0.2957***	-0.3944***	-0.2812***	-0.2948***	-0.1363***	0.0087	-0.0728**	0.7071***	0.2620***	0.3239***
	(-3.47)	(-3.41)	(-3.26)	(-3.52)	(-3.40)	(-3.26)	(-2.62)	(0.25)	(-1.98)	(9.03)	(2.80)	(3.97)
SIZE	0.0282	0.0077	0.0045	0.0283	0.0114	0.0055	0.0337***	0.0142	0.0158**	0.0720***	0.0704***	0.0162
	(0.94)	(0.25)	(0.20)	(0.95)	(0.38)	(0.25)	(2.77)	(1.33)	(2.05)	(2.95)	(2.90)	(1.31)
MTB	-0.0250***	-0.0093	-0.0099	-0.0250***	-0.0083	-0.0097	0.0052	-0.0007	0.0026	-0.0116	-0.0032	0.0026
	(-2.99)	(-0.87)	(-1.37)	(-2.97)	(-0.79)	(-1.34)	(1.23)	(-0.24)	(0.91)	(-1.64)	(-0.48)	(0.50)
LEV	0.0164	0.0553	-0.0424	0.0174	0.0659	-0.0433	-0.0103	0.0297	-0.0124	0.0103	-0.0272	-0.0360
	(0.23)	(0.72)	(-0.65)	(0.25)	(0.88)	(-0.68)	(-0.34)	(1.02)	(-0.54)	(0.21)	(-0.48)	(-1.02)
NOA	0.0096	0.0001	0.0229**	0.0096	0.0020	0.0230**	0.0024	-0.0007	0.0010	-0.0061	0.0019	0.0059
	(0.57)	(0.00)	(2.31)	(0.58)	(0.14)	(2.31)	(0.55)	(-0.19)	(0.36)	(-0.71)	(0.28)	(1.24)
AEM_{T-1}	-0.0036											
	(-0.05)											
POST_REG* AEM_{t-1}		-0.0081										
		(-0.08)										
DA_{T-1}				0.0083								
				(0.18)								
POST_REG* DA_{T-1}					0.1250**							
					(2.10)							
C_PROD							-0.0011			0.0349***		
							(-0.16)			(2.89)		
POST_REG* C_PROD								-0.0027			0.0112	
								(-0.72)			(1.62)	
AEMt-1*FAMC10			0.0333									
			(0.34)									
DA*FAMC10						-0.0022						
						(-0.04)						
REM*FAM_C10									0.0014			0.0157**
									(0.29)			(2.17)
Observations	1,027	1,027	1,027	1,027	1,027	1,027	1,153	1,153	1,153	1,153	1,153	1,153
Adjusted R-squared	0.0615	0.0182	0.0512	0.0615	0.0270	0.0510	0.0809	0.2866	0.1316	0.1765	0.0597	0.0888
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	NO	YES	YES	YES	YES
F-statistic	3.009	1.298	2.320	3.025	1.524	2.186	5.059	29.63	10.74	10.93	2.070	3.585

Table 44: First Stage Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008 of Family Firms with Control Threshold at 25%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
VARIABLES	REM	POST_REG*REM	REM*FAM_C25	REM	POST_REG*REM	REM*FAM_C25	AEM	POST_REG*AEM	AEM*FAM_C25	DA	POST_REG*DA	DA*FAM_C25
POST_REG	-0.0385	-0.0015	0.0215**	-0.0368	0.0203	0.0222**	-0.0013	0.0756***	-0.0046	0.0025	-0.0045	0.0099**
	(-1.35)	(-0.05)	(2.49)	(-1.29)	(0.87)	(2.56)	(-0.13)	(12.55)	(-0.72)	(0.35)	(-0.55)	(2.01)
INBD	-0.0518	0.0091	-0.1277*	-0.0584	0.0081	-0.1281*	0.0193	-0.0420**	0.0013	0.0122	-0.0251	0.0013
	(-0.50)	(0.09)	(-1.77)	(-0.56)	(0.09)	(-1.77)	(0.52)	(-2.06)	(0.05)	(0.22)	(-1.04)	(0.03)
FAM_C25	-0.0473	-0.0232	-0.0201	-0.0483	-0.0250	-0.0308	0.0094	0.0050	0.1162***	0.0209	0.0009	-0.0211
	(-1.19)	(-0.57)	(-0.41)	(-1.22)	(-0.63)	(-0.64)	(0.71)	(1.02)	(8.71)	(0.80)	(0.12)	(-0.81)
ROA	-0.7979***	-0.2898**	-0.3318***	-0.7982***	-0.2570**	-0.3304***	-0.0529	0.0535	-0.0363	0.5434***	0.2095***	0.2399***
	(-6.06)	(-2.26)	(-3.75)	(-6.13)	(-2.13)	(-3.74)	(-1.11)	(1.64)	(-1.29)	(8.65)	(3.74)	(4.59)
SIZE	0.0549**	-0.0086	0.0228	0.0590**	-0.0178	0.0249	0.0037	0.0068	0.0024	0.0221**	0.0084	0.0029
	(2.15)	(-0.32)	(1.52)	(2.30)	(-0.80)	(1.63)	(0.49)	(1.55)	(0.49)	(2.10)	(1.40)	(0.43)
MTB	-0.0224**	-0.0102	-0.0093	-0.0237***	-0.0094	-0.0102	0.0089***	0.0017	0.0039	-0.0157***	-0.0079***	-0.0081**
	(-2.53)	(-1.01)	(-1.47)	(-2.70)	(-1.04)	(-1.60)	(2.75)	(0.80)	(1.64)	(-3.54)	(-2.65)	(-2.32)
LEV	0.1037	0.0811	0.0812	0.1000	0.1023	0.0800	0.0387*	0.0239*	0.0166	0.1291***	0.0436**	0.0619**
	(1.56)	(0.97)	(1.62)	(1.49)	(1.33)	(1.60)	(1.95)	(1.81)	(1.16)	(3.64)	(2.18)	(2.51)
NOA	-0.0055	0.0008	0.0006	-0.0042	0.0000	0.0014	-0.0053	0.0002	-0.0019	-0.0173**	-0.0056	-0.0085
	(-0.49)	(0.08)	(0.07)	(-0.37)	(0.00)	(0.17)	(-1.23)	(0.13)	(-0.58)	(-2.09)	(-1.56)	(-1.49)
AEM_{t-1}	-0.0202											
	(-0.28)											
POST_REG* AEM_{t-1}		-0.0439										
		(-0.23)										
DA_{T-1}				-0.0959**								
				(-2.50)								
POST_REG* DA_{T-1}					0.1914							
					(1.48)							
C_PROD							0.0006			0.0220**		
							(0.11)			(2.54)		
POST_REG* DA_{T-1}								-0.0038			0.0069*	
								(-1.13)			(1.67)	
AEMt-1*FAMC25			-0.0853									
			(-1.27)									
DA*FAMC25						-0.0777*						
						(-1.66)						
REM*FAM_C25									-0.0059			0.0106
									(-1.14)			(1.61)
Constant	-0.7203*	0.1414		-0.7822**	0.2677		-0.0139	-0.1065		-0.4206**	-0.1303	
	(-1.85)	(0.36)		(-2.00)	(0.82)		(-0.13)	(-1.64)		(-2.58)	(-1.45)	
Observations	2,200	2,200		2,200	2,200		2,217	2,217	2,217	2,217	2,217	2,217
Adjusted R-squared	0.1052	0.0196		0.1102	0.0241		0.0351	0.4273	0.1059	0.0566	0.0446	0.0186
Industry Fixed Effect	YES	YES		YES	YES		YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES		YES	NO		YES	NO	YES	NO	YES	YES
F-statistic	6.940	2.484		7.084	3.004		4.668	49.65	9.528	10.03	3.137	3.230

Table 45: First Stage Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008 of Family Firms with Control Threshold at 10%

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
VARIABLES	REM	POST_REG*REM	REM*FAM_C10	REM	POST_REG*REM	REM*FAM_C10	AEM	POST_REG*AEM	AEM*FAM_C10	DA	POST_REG*DA	DA*FAM_C10
POST_REG	-0.0364	0.0003	0.0236**	-0.0345	0.0207	0.0240**	-0.0009	0.0754***	-0.0090	0.0018	-0.0046	0.0079
	(-1.26)	(0.01)	(2.34)	(-1.19)	(0.88)	(2.34)	(-0.09)	(12.55)	(-1.25)	(0.25)	(-0.56)	(1.38)
INBD	-0.0579	0.0065	-0.1356*	-0.0645	0.0073	-0.1442*	0.0213	-0.0415**	0.0137	0.0165	-0.0249	-0.0143
	(-0.56)	(0.06)	(-1.79)	(-0.62)	(0.08)	(-1.87)	(0.58)	(-2.04)	(0.47)	(0.30)	(-1.04)	(-0.29)
FAM_C10	-0.0240	-0.0247	-0.0233	-0.0284	-0.0274	-0.0296	-0.0078	0.0024	0.0871***	-0.0117	-0.0012	-0.0401*
	(-0.73)	(-0.68)	(-0.52)	(-0.82)	(-0.80)	(-0.65)	(-0.83)	(0.62)	(7.35)	(-0.53)	(-0.19)	(-1.91)
ROA	-0.7970***	-0.2890**	-0.3853***	-0.7973***	-0.2573**	-0.3893***	-0.0534	0.0535	-0.0422	0.5417***	0.2095***	0.2825***
	(-6.03)	(-2.25)	(-3.99)	(-6.09)	(-2.13)	(-4.06)	(-1.12)	(1.64)	(-1.33)	(8.63)	(3.74)	(4.82)
SIZE	0.0530**	-0.0096	0.0239	0.0572**	-0.0184	0.0274	0.0041	0.0070	0.0074	0.0233**	0.0085	0.0100
	(2.09)	(-0.34)	(1.32)	(2.24)	(-0.81)	(1.47)	(0.56)	(1.58)	(1.29)	(2.22)	(1.40)	(1.20)
MTB	-0.0224**	-0.0100	-0.0113*	-0.0237***	-0.0093	-0.0118*	0.0092***	0.0018	0.0055**	-0.0154***	-0.0079***	-0.0089**
	(-2.54)	(-1.00)	(-1.73)	(-2.71)	(-1.03)	(-1.82)	(2.82)	(0.82)	(2.16)	(-3.51)	(-2.67)	(-2.23)
LEV	0.1024	0.0802	0.0814	0.0984	0.1005	0.0768	0.0384*	0.0240*	0.0073	0.1282***	0.0435**	0.0529*
	(1.52)	(0.96)	(1.56)	(1.45)	(1.32)	(1.47)	(1.95)	(1.82)	(0.46)	(3.64)	(2.18)	(1.92)
NOA	-0.0058	0.0007	0.0029	-0.0045	-0.0002	0.0039	-0.0051	0.0003	-0.0046	-0.0169**	-0.0056	-0.0110*
	(-0.52)	(0.07)	(0.30)	(-0.40)	(-0.02)	(0.40)	(-1.21)	(0.14)	(-1.58)	(-2.04)	(-1.56)	(-1.92)
AEM_{T-1}	-0.0217											
	(-0.30)											
POST_REG* AEM_{t-1}		-0.0451										
		(-0.23)										
DA_{T-1}				-0.0971**								
				(-2.52)								
POST_REG* DA_{T-1}					0.1918							
					(1.48)							
C_PROD							0.0004			0.0215**		
							(0.06)			(2.46)		
POST_REG* AEM_{t-1}								.				
								(.)				
POST_REG* C_PROD								-0.0038			0.0069*	
								(-1.12)			(1.67)	
AEMt-1*FAMC10			0.0000									
			(0.00)									
DA*FAMC10						-0.1097***						
						(-2.71)			-0.0018			0.0091
REM*FAM_C10									(-0.40)			(1.36)
Constant	-0.7004*	0.1595		-0.7603*	0.2815		-0.0120	-0.1084*		-0.4217***	-0.1303	
	(-1.80)	(0.39)		(-1.95)	(0.85)		(-0.11)	(-1.66)		(-2.61)	(-1.44)	
Observations	2,200	2,200	2,200	2,200	2,200	2,200	2,217	2,217	2,217	2,217	2,217	2,217
Adjusted R-squared	0.1043	0.0197	0.0458	0.1094	0.0244	0.0530	0.0350	0.4272	0.0787	0.0562	0.0446	0.0241
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	NO	YES	NO	YES	YES	NO	YES	YES	YES	NO
F-statistic	6.899	2.541	4.112	6.928	3.104	5.099	4.454	49.75	8.870	9.977	3.114	3.833

Table 46: First Stage Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 1999 of Top Five Ownership Concentration Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
VARIABLES	REM	POST_REG *REM	REM*OWN_T5	REM	POST_REG *REM	REM*OWN_T5	AEM	POST_REG*AEM	AEM*OWN_T5	DA	POST_REG *DA	DA*OWN_T5
POST_REG	0.0290	0.0076	-0.0118	0.0294	0.0097	-0.0111	-0.0045	0.0675***	0.0024	-0.0246*	-0.0274*	-0.0210***
	(1.32)	(0.39)	(-1.07)	(1.36)	(0.54)	(-1.02)	(-0.49)	(6.85)	(0.62)	(-1.69)	(-1.66)	(-2.92)
INBD	0.0312	0.0628	0.1385*	0.0315	0.0647	0.1365*	0.0575	0.0100	-0.0327	0.0298	0.0816	0.0343
	(0.27)	(0.62)	(1.78)	(0.27)	(0.65)	(1.76)	(1.19)	(0.25)	(-1.10)	(0.37)	(1.18)	(0.89)
OWN_T5	-0.0063	-0.0475*	-0.0118	-0.0063	-0.0478*	-0.0150	0.0083	-0.0030	0.0836***	-0.0152	-0.0169	-0.0430**
	(-0.37)	(-1.71)	(-0.39)	(-0.37)	(-1.74)	(-0.50)	(1.02)	(-0.39)	(6.90)	(-1.32)	(-1.52)	(-2.32)
ROA	-0.3096***	-0.1889***	-0.1429**	-0.3080***	-0.1782***	-0.1370**	-0.1537***	-0.0076	-0.0915***	0.7137***	0.2153***	0.2630***
	(-3.82)	(-3.34)	(-2.41)	(-3.83)	(-3.26)	(-2.30)	(-3.86)	(-0.29)	(-3.79)	(12.26)	(3.24)	(5.48)
SIZE	0.0288	0.0005	-0.0004	0.0290	0.0040	-0.0012	0.0289**	0.0096	0.0128	0.0684***	0.0673***	0.0135
	(1.08)	(0.02)	(-0.03)	(1.09)	(0.15)	(-0.08)	(2.51)	(0.96)	(1.45)	(3.11)	(3.07)	(0.97)
MTB	-0.0173**	-0.0059	-0.0060	-0.0172**	-0.0041	-0.0055	0.0051	0.0021	-0.0017	-0.0076	0.0005	-0.0029
	(-2.51)	(-0.82)	(-1.10)	(-2.48)	(-0.58)	(-1.02)	(1.43)	(0.74)	(-0.76)	(-1.22)	(0.08)	(-0.90)
LEV	0.0331	0.0490	0.0016	0.0345	0.0603	0.0059	-0.0025	0.0327	0.0065	0.0227	-0.0159	0.0282
	(0.56)	(0.82)	(0.03)	(0.58)	(1.03)	(0.11)	(-0.09)	(1.27)	(0.35)	(0.51)	(-0.33)	(0.83)
NOA	0.0164	0.0051	0.0005	0.0165	0.0066	0.0010	-0.0007	-0.0001	-0.0030	-0.0033	0.0005	-0.0032
	(1.26)	(0.44)	(0.05)	(1.28)	(0.61)	(0.12)	(-0.20)	(-0.05)	(-1.15)	(-0.49)	(0.10)	(-0.57)
AEM_{t-1}	0.0070											
	(0.12)											
POST_REG* AEM_{t-1}		0.0159										
		(0.17)										
AEM_{t-1}*OW_T5			-0.0419									
			(-0.47)									
DA_{t-1}				0.0051								
				(0.14)								
POST_REG* DA_{t-1}					0.1204**							
					(2.32)							
DA_{t-1}*OWN_T5						0.0668						
						(1.16)						
C_PROD							0.0005			0.0245***		
							(0.10)			(2.65)		
POST_REG*C_PROD								0.0011			0.0099	
								(0.31)			(1.49)	
C_PROD*OWN_T5									0.0035			0.0127
									(0.66)			(1.38)
Constant	-0.4682	-0.0312	-0.0124	-0.4717	-0.0930	-0.0046	-0.3777**	-0.1601	-0.1806	-1.0793***	-1.0263***	-0.2099
	(-1.14)	(-0.08)	(-0.05)	(-1.15)	(-0.23)	(-0.02)	(-2.24)	(-1.08)	(-1.37)	(-3.26)	(-3.11)	(-0.99)
Observations	1,310	1,310	1,310	1,310	1,310	1,310	1,465	1,465	1,465	1,465	1,465	1,465
Adjusted R-squared	0.0489	0.0205	0.0128	0.0489	0.0290	0.0155	0.0944	0.3138	0.2024	0.1879	0.0550	0.0545
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	NO	NO	YES	YES	NO	YES	YES	NO
F-statistic	3.096	2.698	1.565	3.082	3.197	1.760	6.301	27.20	21.87	15.46	2.432	6.477

Table 47 : First Stage Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 1999 of Top Ten Ownership Concentration Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
VARIABLES	REM	POST_REG*REM	REM*OWN_T10	REM	POST_REG*REM	REM*OWN_T10	AEM	POST_REG*AEM	AEM*OWN_T10	DA	POST_REG*DA	DA*OWN_T10
POST_REG	0.0266	0.0081	-0.0072	0.0269	0.0098	-0.0065	-0.0034	0.0679***	-0.0005	-0.0255*	-0.0157	-0.0194***
	(1.21)	(0.29)	(-0.66)	(1.25)	(0.54)	(-0.60)	(-0.36)	(6.91)	(-0.08)	(-1.74)	(-1.16)	(-2.64)
INBD	0.0225	0.0225	0.1000	0.0229	0.0632	0.1018	0.0588	0.0109	0.0124	0.0289	0.0943	0.0349
	(0.20)	(0.16)	(1.39)	(0.20)	(0.64)	(1.41)	(1.21)	(0.27)	(0.34)	(0.36)	(1.28)	(0.89)
OWN_T10	0.0232	-0.0319	-0.0232	0.0233	-0.0322	-0.0282	-0.0008	-0.0070	0.0869***	-0.0070	-0.0045	-0.0364*
	(1.38)	(-1.22)	(-0.79)	(1.39)	(-1.27)	(-1.02)	(-0.10)	(-0.92)	(7.14)	(-0.61)	(-0.38)	(-1.94)
ROA	-0.3097***	-0.2230***	-0.1557***	-0.3080***	-0.1793***	-0.1507**	-0.1540***	-0.0074	-0.0774***	0.7144***	0.1617***	0.2618***
	(-3.82)	(-3.66)	(-2.61)	(-3.84)	(-3.29)	(-2.53)	(-3.87)	(-0.28)	(-3.15)	(12.25)	(2.61)	(5.54)
SIZE	0.0296	0.0028	-0.0034	0.0297	0.0027	-0.0044	0.0287**	0.0093	0.0130	0.0683***	0.0321*	0.0175
	(1.11)	(0.10)	(-0.22)	(1.11)	(0.11)	(-0.29)	(2.48)	(0.92)	(1.31)	(3.07)	(1.69)	(1.24)
MTB	-0.0165**	-0.0045	-0.0070	-0.0164**	-0.0037	-0.0068	0.0048	0.0020	0.0001	-0.0075	0.0018	-0.0029
	(-2.37)	(-0.50)	(-1.23)	(-2.35)	(-0.52)	(-1.20)	(1.35)	(0.69)	(0.04)	(-1.19)	(0.35)	(-0.90)
LEV	0.0353	0.0529	-0.0121	0.0367	0.0642	-0.0090	-0.0036	0.0330	-0.0073	0.0248	-0.0410	0.0293
	(0.59)	(0.81)	(-0.24)	(0.62)	(1.10)	(-0.18)	(-0.13)	(1.28)	(-0.34)	(0.56)	(-0.84)	(0.86)
NOA	0.0166	0.0051	-0.0007	0.0166	0.0078	-0.0004	-0.0007	-0.0001	-0.0021	-0.0032	0.0088	-0.0021
	(1.28)	(0.43)	(-0.08)	(1.30)	(0.72)	(-0.04)	(-0.19)	(-0.03)	(-0.82)	(-0.47)	(1.45)	(-0.40)
AEM_{t-1}	0.0036											
	(0.06)											
POST_REG* AEM_{t-1}		0.0083										
		(0.09)										
AEM_{t-1}*OW_T10			-0.0630									
			(-0.67)									
DA_{t-1}				0.0063								
				(0.17)								
POST_REG* DA_{t-1}					0.1183**						-0.0706	
					(2.28)						(-1.10)	
DA_{t-1}*OWN_T10						0.0566						
						(0.94)						
C_PROD							0.0003			0.0248***		
							(0.05)			(2.68)		
POST_REG*C_PROD								0.0012				
								(0.34)				
C_PROD*OWN_T10									0.0008			0.0102
									(0.14)			(1.10)
Constant	-0.4924	-0.0647	0.0579	-0.4954	-0.0860	0.0691	-0.3705**	-0.1543	-0.1968	-1.0817***	-0.5089*	-0.2742
	(-1.18)	(-0.16)	(0.23)	(-1.19)	(-0.21)	(0.29)	(-2.18)	(-1.03)	(-1.33)	(-3.23)	(-1.81)	(-1.28)
Observations	1,310	1,310	1,310	1,310	1,310	1,310	1,465	1,465	1,465	1,465	1,324	1,465
Adjusted R-squared	0.0507	0.0157	0.0141	0.0507	0.0253	0.0154	0.0935	0.3144	0.2321	0.1871	0.0400	0.0545
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
F-statistic	3.160	1.724	1.693	3.159	2.949	1.735	6.348	27.64	12.67	15.60	1.559	6.952

Table 48: First Stage Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008 of Top Five Ownership Concentration Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
VARIABLES	REM	POST_REG*REM	REM*OWN_T5	REM	POST_REG*REM	REM*OWN_T5	AEM	POST_REG*AEM	AEM*OWN_T5	DA	POST_REG*DA	DA*OWN_T5
POST_REG	-0.0213	0.0136	0.0009	-0.0225	0.0137	0.0013	0.0059	0.0833***	0.0049	0.0047	-0.0094	0.0030
	(-0.82)	(0.67)	(0.09)	(-0.86)	(0.69)	(0.14)	(0.63)	(11.11)	(0.79)	(0.67)	(-1.36)	(0.68)
INBD	-0.0099	-0.0098	-0.0072	-0.0175	0.0019	0.0010	-0.0342	-0.0552**	-0.0263	-0.0398	-0.0438*	0.0288
	(-0.10)	(-0.13)	(-0.12)	(-0.18)	(0.03)	(0.02)	(-0.98)	(-2.56)	(-1.31)	(-0.71)	(-1.72)	(0.90)
OWN_T5	0.0441**	0.0069	0.0518*	0.0432**	0.0083	0.0350	0.0151**	0.0019	0.0900***	-0.0135	-0.0073	-0.0135
	(2.28)	(0.41)	(1.94)	(2.22)	(0.51)	(1.42)	(2.09)	(0.39)	(9.77)	(-1.21)	(-1.11)	(-0.92)
ROA	-0.6370***	-0.2663***	-0.2850***	-0.6386***	-0.2576***	-0.2885***	-0.0711*	0.0475**	0.0134	0.5847***	0.1703***	0.1832***
	(-5.77)	(-2.96)	(-3.54)	(-5.73)	(-2.88)	(-3.55)	(-1.84)	(2.00)	(0.56)	(9.99)	(4.17)	(4.69)
SIZE	0.0746***	0.0292	0.0242*	0.0770***	0.0240	0.0252**	-0.0014	0.0075*	0.0027	0.0302***	0.0184***	0.0051
	(3.13)	(1.33)	(1.93)	(3.19)	(1.14)	(1.97)	(-0.25)	(1.79)	(0.69)	(3.36)	(3.22)	(0.85)
MTB	-0.0268***	-0.0176*	0.0010	-0.0271***	-0.0178*	0.0005	0.0089***	0.0017	0.0020	-0.0098**	-0.0053**	-0.0028
	(-2.87)	(-1.82)	(0.17)	(-2.89)	(-1.86)	(0.08)	(3.21)	(0.96)	(1.20)	(-2.46)	(-2.24)	(-1.02)
LEV	0.0561	0.0486	0.1037**	0.0499	0.0626	0.1038**	0.0167	0.0116	0.0181	0.0551*	0.0114	0.0404*
	(0.88)	(0.70)	(2.30)	(0.78)	(0.93)	(2.28)	(0.97)	(1.08)	(1.42)	(1.68)	(0.72)	(1.69)
NOA	-0.0044	0.0019	-0.0130**	-0.0034	-0.0002	-0.0129**	-0.0040	-0.0001	-0.0009	-0.0105**	-0.0032	-0.0061*
	(-0.48)	(0.27)	(-2.44)	(-0.37)	(-0.02)	(-2.40)	(-1.37)	(-0.03)	(-0.59)	(-1.97)	(-1.20)	(-1.91)
AEM_{t-1}	-0.0145											
	(-0.22)											
POST_REG* AEM_{t-1}		-0.0110										
		(-0.07)										
AEM_{t-1}*OW_T5			-0.1953**									
			(-1.97)									
DA_{t-1}				-0.0657*								
				(-1.77)								
POST_REG* DA_{t-1}					0.1838*							
					(1.91)							
DA_{t-1}*OWN_T5						-0.0494						
						(-0.80)						
C_PROD							-0.0018			0.0211***		
							(-0.44)			(3.47)		
POST_REG*C_PROD								-0.0016			0.0097**	
								(-0.50)			(2.38)	
C_PROD*OWN_T5									0.0036			0.0051
									(0.83)			(0.66)
Constant	-1.0826***	-0.4268	-0.4064**	-1.1138***	-0.3568	-0.4230**	0.0921	-0.1036*	-0.0525	-0.4919***	-0.2608***	-0.1044
	(-3.06)	(-1.36)	(-2.19)	(-3.10)	(-1.18)	(-2.25)	(1.04)	(-1.67)	(-0.93)	(-3.55)	(-3.08)	(-1.17)
Observations	2,646	2,646	2,646	2,646	2,646	2,646	2,903	2,903	2,903	2,903	2,903	2,903
Adjusted R-squared	0.0844	0.0243	0.0462	0.0866	0.0308	0.0420	0.0395	0.4041	0.1811	0.0841	0.0489	0.0203
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	NO	NO	YES	YES	NO	NO	NO	NO
F-statistic	5.190	3.217	3.824	5.173	3.414	3.763	5.602	30.20	14.28	14.28	6.531	3.532

Table 49: First Stage Regression Results of Association between Earnings Substitution and Regulatory Regime Change in 2008 of Top Ten Ownership Concentration Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
VARIABLES	REM	POST*REG_REM	REM*OWN_T10	REM	POST_REG*REM	REM*OWN_T10	AEM	POST_REG*AEM	AEM*OWN_T10	DA	POST_REG*DA	DA*OWN_T10
POST_REG	-0.0195	-0.0188	0.0011	-0.0209	0.0138	0.0020	0.0059	0.0831***	0.0034	0.0044	0.0020	0.0057
	(-0.76)	(-0.70)	(0.12)	(-0.80)	(0.70)	(0.22)	(0.62)	(10.99)	(0.56)	(0.63)	(0.40)	(1.28)
INBD	-0.0123	0.0092	0.0159	-0.0200	0.0020	0.0229	-0.0350	-0.0553**	-0.0223	-0.0402	-0.0342	0.0255
	(-0.13)	(0.11)	(0.27)	(-0.21)	(0.03)	(0.40)	(-1.00)	(-2.56)	(-1.15)	(-0.71)	(-1.30)	(0.85)
OWN_T10	0.0274	0.0054	0.0006	0.0271	0.0028	-0.0162	0.0132*	0.0044	0.0918***	-0.0038	0.0003	-0.0137
	(1.44)	(0.31)	(0.02)	(1.43)	(0.16)	(-0.70)	(1.82)	(0.82)	(9.80)	(-0.40)	(0.04)	(-0.99)
ROA	-0.6379***	-0.2949***	-0.2319***	-0.6396***	-0.2579***	-0.2331***	-0.0717*	0.0472**	0.0170	0.5851***	0.1888***	0.1787***
	(-5.73)	(-3.11)	(-3.29)	(-5.69)	(-2.88)	(-3.27)	(-1.87)	(1.99)	(0.73)	(10.05)	(4.21)	(4.69)
SIZE	0.0746***	0.0377	0.0203*	0.0771***	0.0240	0.0210*	-0.0014	0.0076*	0.0017	0.0303***	0.0182***	0.0055
	(3.11)	(1.56)	(1.74)	(3.17)	(1.13)	(1.77)	(-0.24)	(1.82)	(0.45)	(3.37)	(2.90)	(0.95)
MTB	-0.0263***	-0.0196*	0.0031	-0.0266***	-0.0177*	0.0023	0.0091***	0.0017	0.0024	-0.0099**	-0.0071**	-0.0038
	(-2.79)	(-1.89)	(0.49)	(-2.82)	(-1.85)	(0.36)	(3.27)	(0.98)	(1.44)	(-2.49)	(-2.40)	(-1.36)
LEV	0.0580	0.0343	0.0775*	0.0516	0.0624	0.0763*	0.0179	0.0118	0.0312**	0.0549*	0.0107	0.0383
	(0.89)	(0.47)	(1.80)	(0.79)	(0.92)	(1.76)	(1.05)	(1.10)	(2.54)	(1.67)	(0.56)	(1.61)
NOA	-0.0054	0.0009	-0.0068	-0.0043	-0.0003	-0.0067	-0.0043	-0.0001	-0.0000	-0.0102*	-0.0020	-0.0045
	(-0.61)	(0.13)	(-1.47)	(-0.49)	(-0.05)	(-1.41)	(-1.49)	(-0.06)	(-0.00)	(-1.93)	(-0.79)	(-1.42)
AEM_{t-1}	-0.0161											
	(-0.25)											
POST_REG* AEM_{t-1}		-0.0089										
		(-0.06)										
AEM_{t-1}*OW_T5			-0.1848*									
			(-1.66)									
DA_{t-1}				-0.0672*								
				(-1.80)								
POST_REG* DA_{t-1}					0.1831*						0.0078	
					(1.90)						(0.17)	
DA_{t-1}*OWN_T5						-0.0157						
						(-0.29)						
C_PROD							-0.0019			0.0211***		
							(-0.45)			(3.47)		
POST_REG*C_PROD								-0.0016				
								(-0.50)				
C_PROD*OWN_T5									0.0010			0.0057
									(0.25)			(0.89)
Constant	-1.0750***	-0.5353	-0.3347*	-1.1079***	-0.3539	-0.3457**	0.0922	-0.1069*	-0.0452	-0.4981***	-0.2643***	-0.1097
	(-3.02)	(-1.56)	(-1.96)	(-3.07)	(-1.17)	(-2.01)	(1.05)	(-1.72)	(-0.85)	(-3.60)	(-2.77)	(-1.25)
Observations	2,646	2,646	2,646	2,646	2,646	2,646	2,903	2,903	2,903	2,903	2,636	2,903
Adjusted R-squared	0.0828	0.0259	0.0297	0.0851	0.0307	0.0249	0.0393	0.4045	0.1984	0.0836	0.0448	0.0188
Industry Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES	NO	NO	YES	YES	YES	NO	YES	NO
F-statistic	5.418	2.057	2.974	5.360	3.418	2.892	5.603	30.09	14.01	13.93	5.688	3.482

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