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Regulatory reforms, board independence and earning quality

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Abstract

We investigate the exogenous increase in the proportion of independent non-executive directors (INEDs) in response to the corporate governance regulations 2012 in Singapore and Vietnam to estimate the effectiveness of INEDs in restraining earnings management. We also investigate the moderating effect of two important characteristics of INEDs: education and tenure on the relationship between regulations 2012 and earnings management. Our core findings show that voluntary adopters with better INEDs education and optimal tenure experience a significant decrease in earnings management compared to mandatory adopters with lower of INEDs education and suboptimal tenure.

Keywords: *Board independence, Earnings management, Corporate governance regulations, Board education, Board tenure*

1. Introduction

Corporate governance (CG) bodies across the developed and emerging market emphasize the greater proportion of INEDs for an optimal board composition to protect the minority shareholders and for better governance practice. Following the US lead, several emerging economies revised their CG regulations to enhance the representation of INEDs on board. To this end, the Monetary Authority of Singapore (MAS) revised the CG regulations in May 2012 and emphasize that at least one-third of the board members should be INEDs. Likewise, the State Security Commission (SCC) of Vietnam also revised CG regulations in July 2012 and required all listed firms to maintain at least one-third of the board members as INEDs.

We have three core objectives of this study. First, we exploit the exogenous changes in the proportion of INEDs in response to the CG regulations 2012 (*regulations-2012*) of Singapore and Vietnam to determine the effectiveness of *regulations-2012* in restraining earnings management. To this end, we investigate whether an increase in the proportion of INEDs as a mandatory requirement of the *regulations-2012* is linked to a decrease in earnings management.[1] Since earnings quality is one of the main objectives of CG regulations, particularly in emerging markets, it is worth examining whether these governance regulations

[1] The firms which did not have one-third of the board members as INEDs in the pre-regulation period (e.g. before 2012) have to increase their proportion of board independence. This provides a natural experiment to investigate whether increases in the proportion of INEDs tend to reduce in earnings management.

mitigate earnings management.[2] Prior literature links the presence of INEDs to management actions and the quality of voluntary disclosures (Ajinkya ET AL., 2005; Frankel et al., 2011; Karamanou & Vafeas, 2005). We thus emphasize on INEDs because this governance element is linked to earnings-related disclosure as the board members tend to review earnings announcements.

Second, *regulations-2012* of both Singapore and Vietnam have not specified any requirements for INEDs education and tenure which motivate us to exploit the lack of provisions regarding INEDs education and tenure by testing whether these attributes do matter for the efficient monitoring of INEDs to restrain earnings management. To this end, we first time investigate the direct impact of INEDs education and tenure on earnings management. We specifically investigate whether a higher level of INEDs education and an optimal level of INEDs tenure (i.e. 5-9 years) reduces the earnings management practice.

To estimate the direct impact of INEDs on earnings management, we incorporate three distinct perspectives about the role of INEDs in restraining earnings management considering the dynamics of emerging markets. These three perspectives of the INEDs role are the compliance perspective, the entrenchment perspective, and the alignment/optimization perspective. By incorporating these three perspectives, we estimate the monitoring and advising role of INEDs in restraining earnings management after the release of *regulations-2012.*

Considering the first aspect i.e. 'compliance perspective', we conjecture that firms appoint INEDs merely for compliance purposes by following a tick-box approach hence INEDs are independent on paper but have no capacity or skills to perform monitoring and advisory function. We call the second perspective i.e. 'entrenchment perspective' where the CEO or controlling shareholders unduly collude with newly appointed INEDs by developing a coalition with them for the extraction of private benefits. We test the third perspective i.e. 'alignment/optimization' where senior managers trade-off the cost and benefits of monitoring and advising function of the INEDs to maximize shareholders' value.

The third objective of this study is to investigate the moderating effect of INEDs education and tenure on the relationship between *regulations-2012* and earnings management. More specifically, we explore whether INEDs education and tenure can alter the strength and direction of the relationship between the mitigating effect of *regulations-2012* and earnings

[2] There is no mandatory requirements of independence of audit committee explained by the *regulations-2012* hence we have not incorporate the independence of audit committee as explanatory variable.

management. As far as we are aware, no prior study has investigated the role of INEDs education and tenure in restraining earnings management**.**

In addition, we argue that it's less likely that an increase in the proportion of INEDs in response to the *regulations-2012* would have a uniform influence on sample firms, instead, we expect a diverse impact based on firms' specific characteristics. We thus classify our sample across voluntary adopters (i.e. firms that voluntarily appointed a minimum of one-third of the board members as INEDs before the introduction of *regulations-2012*) and mandatory adopters (e.g. firms that did not voluntarily appoint one-third of the board members as INEDs before the introduction of *regulations-2012*). The mandatory adopters appointed a minimum of one-third of the board members as INEDs when it became a mandatory requirement after the release of *regulations-2012*. This increase in board independence provides a natural experiment to investigate whether increases in the proportion of INEDs lead to decreases in earnings management. We thus investigate whether the mitigating impact of *regulations-2012* differs across voluntary adopters and mandatory adopters as we predict different behaviour of both groups of firms.

Our core findings show that voluntary adopters with better INEDs education and optimal tenure experience a significant decrease in earnings management compared to mandatory adopter firms with lower of INEDs education and tenure. Our results show also that whilst an increase in the proportion of INEDs itself does not mitigate earnings management, a higher level of INEDs education and an optimal tenure tend to facilitate INEDs' monitoring, resulting in a decrease in earnings management.

In contrast, we find an insignificant impact of *regulations-2012* on earnings management in the case of mandatory adopters supporting the 'compliance perspective'. We argue that *regulations-2012* pushed the firms towards the mandatory requirements of INEDs which for many firms are beyond the optimal composition of corporate boards leading to an insignificant impact on earnings management. To this end, we report that mandatory adopters recruited INEDs who develop a coalition with the controlling shareholders, which in turn, offset the mitigating impact of *regulations-2012* on earnings management. This is perhaps by the fact that the INEDs are not independent in the true sense as the powerful CEOs limit their control function by developing a coalition with them − a cultural trait that exists not only in the social fabric of several emerging markets but also, in a few developed markets as well.

Our analysis also finds a significant negative moderating impact of INEDs education and tenure on the relationship between *regulations-2012* and earnings management in the case of

voluntary adopters. While there is no moderating impact in the case of mandatory adopters indicating that the decrease in INEDs education and suboptimal tenure of INEDs offset the monitoring impact of *regulations-2012* on earnings management.

Using the Generalized Method of Moments (GMM), Propensity score matching (PSM) techniques and Difference-in-difference (DiD) approach we contribute to the international CG literature on several counts. First, we provide direct evidence on whether and under which conditions *regulations-2012* mitigate earnings management. Second, we extend the CG literature by introducing three distinct perspectives about the role of INEDs in restraining earnings management namely compliance perspective, entrenchment perspective, and the alignment/optimization perspective elaborating the dynamics of emerging markets. Third, we add to the literature on the benefits of board independence by introducing INEDs education and tenure as the fresh determinants of board independence which strengthen the monitoring and advisory role of INEDs in restraining earnings management.

Fourth, we contribute to the theoretical literature of CG by reporting that in emerging markets the dominant CEO and controlling shareholders exploit the weak legal arrangement and develop a coalition with the INEDs for the extraction of private benefits leading to Type II agency conflicts. Fifth, we also complement the research on the relationship between INEDs and REM with special reference to the release of *regulations-2012* by providing empirical evidence from Singapore and Vietnam.

Last but not least, our analysis suggests a clear policy implication for regulators and policymakers. To this end, we highlight the importance of INEDs' education and tenure suggesting that policymakers need to develop a framework through which firms establish the legitimacy of INEDs by assuring their higher level of education and optimal level of tenure. We recommend that regulators need to set a minimum education level for the appointment of INEDs, together with a provision regarding the maximum tenure of INEDs to enhance the board monitoring function. We also suggest that legislators need to emphasize that the role of INEDs should be established in the spirit of considering them as a strategic partner of the organization.

The paper proceeds as follows. Section 2 presents the literature review and hypotheses development. Section 3 discusses the research methodology and data. Our empirical results are presented in Section 4. We conclude the paper in Section 5.

2. Literature review and hypothesis development

2.1. Significance of emerging markets

As such, our cross-country analysis of Singapore and Vietnam arguably offers an interesting setting to undertake this study, therefore, our focus on the two emerging markets is motivated by several plausible reasons. First, Prior research on earnings management mostly emphasizes developed economies, particularly the US and the UK with widely diffused ownership structures while very few studies have been conducted in the emerging markets context where concentrated ownership and family capitalism are common (Chen & Ho, 2009). To this end, it is unclear whether this established negative relationship between board independence and earnings management can be generalized to emerging markets.

Second, Singapore and Vietnam are classic examples of emerging markets in terms of institutional and regulatory arrangements, governance mechanisms and national governance quality.[3] To this end, a large number of Singaporean and Vietnamese firms are closely held hence their model of ownership structure consists of family-controlled ownership, state ownership, pyramid ownership, and cross-holding (Singh et al., 2018). In addition, the corporate sectors of Singapore and Vietnam are recognised as markets with family capitalism and the dominance of concentrated ownership which provide a suitable platform to test the impact of *regulations-2012* on earnings management.

Third, compared with other settings in the Asian region, Singapore and Vietnam are typical for the protection of minority shareholders. In this regard, Vietnam is recognised as a market with a low rule of law and poor minority protection (World Bank, 2006, 2012). While Singapore is the most representative market for the 'high rule of law' and high minority protection (Heugens et al., 2009) hence we provide the first exploration contrasting, a well-developed emerging market (i.e. Singapore) and a less developed one (i.e. Vietnam).

[3] The monetary authority of Singapore (MAS) revised the CG regulations in May 2012. The primary aim of *regulations-2012* is to strengthen the board monitoring function by introducing a mandatory requirement of the minimum proportion of INEDs. To this end, rule (2.1) emphasizes that at least one-third of the board members must be INEDs. In addition, rule (2.2) states that the INEDs should be at least half of the board composition where (a) the CEO holds the position of the chairman of the board; (b) the CEO and the board chairman are in a close family relationship; (c) the chairman is directly involved in the management.

Likewise, the State Security Commission (SCC) of Vietnam revised the CG regulations (Circular 121) in July 2012, by amending the current regulations particularly, the Supervisory Board, Board of Directors, and shareholder protection. However, the most important change is the requirement of at least one-third of the board member as INEDs. At their core, the revised regulations intended to improve board independence by requiring the firms that one-third of the board members as INEDs.

Fourth, the Singaporean corporate sector achieves top ranking across Asia in terms of best CG practices and has the highest average score of CG across the Association of Southeast Asian Nations (ASEAN) (Nguyen et al., 2015). In contrast, the CG practices of Vietnamese firms are still in the developing stage whilst their CG score is lower than that of other markets across the Asian region (IFC, 2012; World Bank, 2006). Fifth, both countries i.e. Singapore and Vietnam introduced their CG regulations in 2012, requiring one-third of board members to INEDs.

Seventh, due to the unique characteristics of emerging economies with a special orientation, Singapore and Vietnam are often not included in many cross-countries studies of earnings management around the world (Tran & Holloway, 2014). Hence despite the significance of emerging markets, Singapore and Vietnam are still relatively under-researched. Last but not least, we employ a dynamic model specification for two important emerging markets i.e. Singapore and Vietnam where the institutional and governance arrangements are greatly different from those of the UK and the US. Therefore, from a comparative perspective, the aforesaid heterogeneity across firm-level governance in both settings is vital to strengthen empirical analysis whilst allowing us to ascertain credible inferences.

2.2. Agency theory

Most CG research follows agency theory which emphasizes the monitoring role of INEDs in alleviating agency conflicts and predicts a positive impact of INEDs on corporate performance (Uribe-Bohorquez et al., 2018; Yusuf et al., 2018). Agency theory argues that the presence of a large number of INEDs provides a monitoring mechanism that limits managers' actions in developing a coalition for private benefit (Brickley & Zimmerman, 2010). Agency theory predicts that effective governance mechanisms pertaining to the corporate board may link with more transparent financial reporting. Consequently, the role of INEDs to mitigate earnings management is more likely to reduce agency problems and minimize the information asymmetry between shareholders and management (Abdou et al., 2020; Rodriguez-Perez & Hemmen,2010). We thus relate our econometric model with the theoretical notion of agency theory to explore the role of INEDs in curbing Type II agency conflicts by incorporating their education and tenure.

2.3. Impact of regulations-2012 on earnings management

It is well-documented in CG literature that the board of directors play an important role in better CG, particularly in monitoring top management (Hutchinson et al., 2008; Zalata & Roberts, 2015). Regarding earnings management, prior research mainly discusses the effectiveness of audit committees in retraining earnings management whilst most of the prior

studies are mainly based on developed economies (e.g. Cohen & Zarowin 2010; Moursli, 2019, Marra et al., 2011; Peasnell, et al., 2005; Roychowdhury, 2006; Zang, 2012). However, there is very literature on the role of INEDs in restraining earnings management, particularly in the emerging market context.

In this study, we specifically exploit the exogenous changes in the proportion of INEDs in response to the CG regulations 2012 (*regulations-2012*) of Singapore and Vietnam to estimate the effectiveness of *regulations-2012* in restraining earnings management. A few studies have investigated the impact of governance regulations on different governance behaviours such as corporate return, executive compensation, stock price, information acquisition cost and the presence of audit committees whilst these studies are in the context of developed economies (see, for example, Adams & Ferreira, 2007; Black & Kim, 2012; Chen et al.,2015; Chhaochharia & Grinstein, 2009; Chhaochharia & Grinstein, 2007; Guthrie et al., 2012; Moursli, 2019; Romano, 2005). No prior study investigated the impact *of regulations-2012* on the monitoring role of INEDs in restraining earning management.

The present study fills the research gap and investigates whether the release of *regulations-2012* in Singapore and Vietnam has a mitigating impact on earning management by testing the monitoring and advising role of INEDs. In this regard, we test three different perspectives on the role of INEDs in restraining earnings management considering the significance of *regulations-2012* namely compliance perspective, entrenchment perspective, and alignment/optimization perspective.

Considering the 'compliance perspective' we argue that firms appoint INEDs merely for compliance purposes by following a tick-box approach hence INEDs are independent on paper but have no capacity or skills to perform advisory and monitoring functions. Moreover, knowing that INEDs are tougher monitors, senior managers are more likely to be reluctant to share key information (Harris & Raviv 2008). To this end, considering the 'compliance perspective', we predict that firms select those INEDs which are less likely to be impartial hence an increase in the proportion of INEDs in response to the *regulation-2012* would not mitigate earnings management.

We call the second perspective i.e. 'entrenchment perspective' where the CEO or controlling shareholders unduly link to newly appointed INEDs by developing a coalition for the extraction of private benefits leading to a higher level of earnings management. In this scenario, the dominant role of controlling shareholders tends to be a serious challenge for INED because the

former can exploit their voting power to influence senior managers for favourable corporate strategies. Hence, under the 'entrenchment perspective,' we predict that an increase in the proportion of INEDs does not mitigate earnings management.

We test the third perspective i.e. 'alignment/optimization' where senior managers trade-off the cost and benefits of monitoring and the advising function of INEDs to enhance firm value. We argue that firms with strong internal CG mechanisms tend to appoint INEDs with the capacity and skill to effectively perform monitoring and advising functions, which in turn, reduce earnings management. We test these three different perspectives regarding the monitoring role INEDs in restraining earnings management by classifying our sample across mandatory adopters and voluntary adopters owing to their different corporate behaviour (i.e. voluntarily appoint one-third of board members as INEDs, and not voluntarily appointed).

We further split our sample between family and non-family firms. The rationale of separate analysis of family and non-family firms is evident as the agency theory argues that family-controlled firms experience different incentives to diversified and atomized shareholders. These distinguishing incentives manifest themselves through differences in the utilization of other control mechanisms such as external discipline and monitoring, which in turn, display a different corporate behaviour of family firms compared to non-family firms (Wang, 2006; Prencipe & Bar-Yosef, 2011). Likewise, Labelle et al.,(2018) document that compares to non-family firms, typical family-controlled firms tend to exhibit lower corporate social performance.

Prior literature also documents that the monitoring effectiveness of INEDs is more likely to reduce in family-controlled firms owing to the concentrated ownership and the presence of family members as board directors (Jaggi et al., 2009) hence we expect different empirical results of our estimation across family and non-family firms. While concentrated ownership and the prevalence of family-controlled are common characteristics of emerging markets, with no exception to Singapore and Vietnam hence we separately test the effects of *regulations-2012* across family and non-family firms (Chen & Huang, 2014). On balance, this review of prior studies leads to our first hypothesis:

H1a: The regulations-2012 have no mitigating impact on earnings management across mandatory adopters and voluntary adopters (family and non-family) — the compliance perspective.

H1b: The regulations-2012 tend to enhance the earnings management practice across mandatory adopters and voluntary adopters (family and non-family) ─ the entrenchment perspective.

H1c: The regulations-2012 mitigates earnings management practice across mandatory adopters and voluntary adopters (family and non-family) ─ the alignment/optimization perspective.

2.4. INEDs Education

Prior research considered the directors' academic qualification as an appropriate proxy for intellectual competence (Ionaşcu & Olimid, 2011). To this end, previous studies document that directors' knowledge, qualifications and tenure are important factors that accelerate the positive impact of board independence on firm performance (DeFond, Haan, & Hu, 2005). Therefore, the individual characteristics of INEDs, particularly higher education tend to enhance their expertise and level of engagement with the firm (Vafeas, 2003).

A recent study by Fedaseyeu et al. (2018) documents that a higher level of INEDs education strengthens board monitoring skills. Likewise, Kakabadse et al., (2010) report that the presence of well-educated INEDs may better deal with the challenges faced by the corporate board. Ujunwa (2012) reports a positive association between directors' education and corporate performance. Similarly, Haniffa & Cooke (2002) find a positive association between INEDs' accounting qualifications and disclosure information.

In addition, prior literature documents that a higher level of formal education of INEDs may enhance their monitoring capacity. For example, Arumona et al., (2019) document that the quality of the board reflects by the members' age, industry experience and higher qualifications. Likewise, Hitts & Tyler (1991) document that a higher level of academic qualification of corporate executives may correlate with firm better strategic decisions, which in turn, positively impact firm performance. Agrawal & Chadha (2005) report that INEDs with accounting or finance backgrounds have more capacity to enhance firm performance than those with non-accounting or finance education. Haniffa & Cooke (2008) support the results of Agrawal & Chadha (2005) and reveal that a corporate board with higher financial education may positively influence firm performance.

A higher level of education strengthens efficient leadership, better skills to manage corporate information, and openness to change (Bohren & Staubo, 2014). Haynes and Hillman (2010) report that a higher level of directors' education positively correlated with research and

development expenditures whilst Herrmann & Datta (2005) shows that better directors' education leads to international diversification.

Pozen (2010) argues that merely industry experience is not enough to manage complex governance issues and suggests that financial education coupled with a specific level of experience may enhance firm performance. Carpenter & Westphal (2001) show that the director's educational level positively impacts their ability to contribute to the board whilst a higher academic education enhances specific knowledge leading to better strategic decision-making.

The above discussion reflects that prior literature has viewed education level as a good proxy for human capital in terms of intellectual competence and knowledge. We thus argue that INEDs education is an important factor that enhances the INEDs' advisory and monitoring capacity to restrain earnings management. We predict that enhanced board monitoring skills of INEDs owing to the element of education may translate into a mitigating impact on earnings management. To this end, we expect that a higher level of INEDs education strengthens the mitigating role of *regulations-2012* in constraining earnings management. We thus predict that if the newly appointed INEDs are more educated than the incumbent INEDs, there will be a stronger mitigating impact of *regulations-2012* on earnings management. Hence, we hypothesize:

H2a: The mitigating effect of regulations-2012 on earnings management will be stronger if the education level of INEDs appointed in post-regulations is greater than the education level of incumbent INEDs.

H2b: The mitigating effect of regulations-2012 on earnings management will be weaker if the education level of INEDs appointed in post-regulations is lower than the education level of incumbent INEDs.

2.5. INEDs tenure

Prior literature considered the board tenure as one of the important board characteristics that significantly influence the monitoring function of INEDs. For example, Kim et al. (2014) report that INEDs tenure positively impacts board performance and links with firm acquisition/investment policy. Livnat et al., (2016) argue that a board with longer tenure is a sign of an optimal board composition hence INEDs with greater tenure can be treated as a proxy for an efficient and well-functioning board that enhances firm value.

Kim et al (2014) document that longer tenure positively influences director performance since they attend more meetings and are well familiar with the firms' strategies, operations, and management behaviour. To this end, INEDs with longer tenure are more likely to have a better understanding of the management approach and corporate affairs, which in turn, strengthens their engagement with board policies. Moreover, long tenure adds expertise to manage the core issues of board members.

Dou et al (2015) and Rutherford (2007) report that the board members with optimal tenure have more knowledge about firm affairs hence effectively curbing the opportunistic behaviour of managers. Vafeas (2003) argue that an optimal level of board tenure tends to enhance knowledge and expertise to understand board strategic decision-making. Alvarado & Bravo (2017) suggest that an optimal level of INEDs tenure may require 5-9 years to understand the firm's specific environment which enables them to perform the advisory and monitoring function more effectively.

Following the above empirical evidence, we argue that an optimal level of INEDs tenure (i.e., between 5-9 years) may effectively mitigate earnings management while a suboptimal tenure (e.g., less than 5 years) is less likely to alleviate the practice of earnings management. We argue that INEDs' skills increase with the level of tenure as they gain firm-specific knowledge which reduces information asymmetry and informational conflict between the board members and management. Since INEDs longer tenure enhances the firm-specific knowledge, we expect a negative association between INEDs tenure and earnings management. Hence, we hypothesize:

H3a: The mitigating effect of regulations-2012 on earnings management will be stronger in the case of an optimal level of INEDs tenure (i.e. 5-9 years).

H3b: The mitigating effect of regulations-2012 on earnings management will be weaker in the case of a lower level of INEDs tenure (i.e. less than 5 years).

3. Research design and sample

3.1 Sample and variables

Our data set is based on all those firms which are locally incorporated and listed on the SGX Mainboard and Catalist (Singapore) and the HOSE and HNX (Vietnam).[4] We selected the year 2008 because it is one year after the promulgation of new CG regulations in Singapore

[4] Singapore Exchange Limited (SGX) is the regulatory authority for listed firms in Singapore which consist of two exchange markets with different listing requirements, namely Mainboard and Catalist. While, Ho-Chi-Minh Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX) are two Vietnamese stock markets.

and Vietnam. In addition, the revised CG regulations/guidelines in both countries have their effects on firms' annual reports in the following financial year hence 2008 is an appropriate sample year for data collection. Moreover, the regulations year (e.g., 2012) of both the countries is same which supports the comparative analysis of both settings.

We exclude Financial Services (SIC codes, 6000–6999), Utilities (SIC codes, 4900–4999) subject to differences in listing and regulatory requirements (Fedaseyeu et al., 2018; Nguyen et al., 2017; Zalata & Roberts, 2015). This results in an unbalanced panel data set of 310 firms of Singapore and 351 firms of Vietnam covering the period 2008-2015. The financial data is extracted from Worldscope 'One Banker' (Financial module), while board attributes and family ownership are obtained from Worldscope 'One Banker' (Ownership module) supplemented by firms' annual reports.

3.2 Measurement of Earnings Management

The higher level of earnings management leads to the information asymmetry problem which discourages potential investors from long-term investment. When the financial reporting is not reliable, firms face multiple consequences leading to an agency cost (Dechow et al., 1996). Importantly, prior studies on the relationship between INEDs and earnings management have not distinguished between real earnings management (REM) and accrual-based earnings management (AEM) while both have fundamentally different procedures with differential risks of detection, visibility and economic consequences and hence require different monitoring mechanisms to reduce their practice (Huang, 2018; Kothari et al., 2016; Lel. U. 2019; Zang, 2012).

For example, the practice of AEM may reduce by the auditors as they detect the breach of the accounting standards in practice (Amin & Cumming, 2021; Sanchez-Ballesta & Yague, 2021; Tsipouridou & Spathis 2014). Therefore, REM is widely used by management and its practice tends to be more harmful to companies as it affects corporate operations.

In addition, in the last two decades, firms have shifted their approaches to earnings management from AEM to REM because of revised accounting and tax regulations, the adoption of IFRS, tighter accounting standards, and the better audit quality that restrict the AEM (Cohen et al., 2008; Zang, 2012). In this regard, a recent study by Li et al., (2021) documents that REM is a more practical way to investigate whether firms are involved in earnings management (Amin & Cumming, 2021). Likewise, Kuo et al., (2014) also report that the regulatory arrangements in emerging markets are not strong whilst management cost is relatively low hence managers tend to prefer REM.

Graham et al. (2005) surveyed 400 executives and report that the managers prefer REM as its draws less attention from regulatory scrutiny and the auditors. Hence, managers expect a relatively higher cost and risk of detection than the benefits of AEM. Likewise, Cohen et al. (2008) show that since the release of the Sarbanes-Oxley Act (SOX), firms tend to prefer REM over AEM as the practice of REM has a lower level of probability of being detected. Importantly, several studies have preferred REM over AEM to estimate earnings management (see, for example, Cohen & Zarowin, 2010; Cohen, Dey, & Lys, 2008; Eng et al., 2019; Kamran et al., 2018; Li et al., 2021; Mojtaba et al., 2017; Pappas et al., 2019; Roychowdhury 2006) hence following these studies we focus on REM for our model estimation considering its significance, particularly in the emerging market context.

We incorporate three proxies to measure REM: i) abnormal cash flows, ii) abnormal production cost and iii) abnormal discretionary expenses as a measure of REM (e.g., Amin & Cumming, 2021; Kothari et al., 2016; Kuo et al.,2014; Roychowdhury 2006; Zang, A. Y. 2012). We use abnormal levels of cash flow from operations (Ab_CFO) which generate by accelerating the timing of sales through increased price discounts and/or more lenient credit terms, which in turn, temporarily enhance sales volumes. Second, we measure abnormal levels of production cost (Ab_PROD) which relates to the overproduction of inventory, resulting in lower fixed cost per unit and a reduction in the cost of sales. Finally, we measure abnormal levels of discretionary expenses: selling, admin and general expenses (Ab_SA&G), research & development expenses, and advertising expense which arises due to the reduction in discretionary expenses.

Given the significance of sales volume, firms that involve in REM tend to engage in one or more of the discretionary activities: abnormally low cash flow from operations, abnormally high cost of production and/or abnormally low discretionary expenses. Following Cohen et al., (2008) and Roychowdhury (2006), we expressed the normal level of cash flow from operations as a linear function of sales and change in sales:

$$\frac{\text{CFO}_{\text{it}}}{\text{Assets}_{\text{it}-1}} = \alpha_0 + \beta_1 \frac{1}{\text{Assets}_{\text{it}-1}} + \beta_2 \frac{\text{Sales}_{it}}{\text{Assets}_{\text{it}-1}} + \beta_3 \frac{\Delta\text{Sales}_{it}}{\text{Assets}_{\text{it}-1}} + \varepsilon_{it} \qquad (1)$$

Where CFO_{it} is the net cash flow from the operation of firm i in year t. $\text{Assets}_{\text{it}}$ is the firm total assets; Sales_{it} is the firm net sales; and $\Delta\,\text{Sales}_{it}$ is the change in net sales of firm i in year t. In addition, we measured the abnormal cash flow (Ab_CFO) as the difference between the actual value and normal value of the cash flow from operation derived from Eq.1 as a residual. Moreover, the sales price discount and lenient credit terms lead to the lower level of cash flows while a lower level of negative residuals link with the lower level of cash flows

from operations suggesting the manipulation in sales volume to manage earnings upwards. Following Roychowdhury (2006), we estimate the normal level of production costs:

$$\frac{\text{PROD}_{\text{it}}}{\text{Assets}_{\text{it}-1}} = \alpha_0 + \beta_1 \frac{1}{\text{Assets}_{\text{it}-1}} + \beta_2 \frac{\text{Sales}_{it}}{\text{Assets}_{\text{it}-1}} + \beta_3 \frac{\triangle\text{Sales}_{it}}{\text{Assets}_{\text{it}-1}} + \beta_4 \frac{\triangle\text{Sales}_{it}}{\text{Assets}_{\text{it}-1}} + \varepsilon_{it} \qquad (2)$$

Where PROD is the sum of the change in inventory and cost of sales for firm i in a year. The abnormal level of production (Ab_PROD) is the difference between the actual value and the normal value of the firm production cost derived from Eq.2 as a residual. Moreover, following Roychowdhury (2006), we estimate the normal levels of discretionary expenses using the following equation:

$$\frac{\text{DE}_{\text{it}}}{\text{Assets}_{\text{it}-1}} = \alpha_0 + \beta_1 \frac{1}{\text{Assets}_{\text{it}-1}} + \beta_2 \frac{\text{Sales}_{it}}{\text{Assets}_{\text{it}-1}} + \varepsilon_{it} \qquad (3)$$

Where DE is the sum of discretionary expenses i.e., selling, admin and general expense (SA&G), research & development, and advertising expenses. The abnormal level of discretionary expenses is the difference between the actual value and normal value of discretionary expense derived from Eq.3 as a residual. The lower level of negative residuals suggests that firms reduce the amount of discretionary expenses to manage earnings upwards.

Cohen et al., (2008) argue that the aggregate measure tends to better capture the REM activities than a single measure. Therefore, following prior studies (e.g., Demerjian et al., 2013; El-Helaly et al., 2018; El-Diri., et al., 2020) we construct the aggregate value of REM by using the sum of three standardized metrics of earnings management proxies mentioned above (e.g., Ab_CFO, Ab_PROD, Ab_DE). To this end, we incorporate an aggregate measure to determine the REM by multiplying standardised residuals from Eq.1, Eq.2 and Eq.3.

$$\text{REM} = \text{Ab\_CFO}(\text{-}1) + \text{Ab\_PROD} + \text{Ab\_DE}\ (\text{-}1) \qquad (4)$$

3.3. Voluntary adopters and Mandatory adopters

In accordance with *regulations-2012*, firms must have at least one-third of their board members as INEDs. Before the release of regulations-2012 firms board have different levels of independence. Several firms already have one-third of their board members as INEDs whilst *regulations-2012* did not affect them hence we refer to them as voluntary adopters. Other firms, in contrast, have not one-third of the board members as INEDs before the *regulations-2012*, hence we refer to them as mandatory adopters. More specifically, the voluntary adopters are categorized as those firms that voluntarily appointed a minimum of one-third of the total board members as INEDs before the *regulations-2012*, and those which did not; are classified as mandatory adopters.

Literature shows that family firms have different agency issues than non-family firms as family dominance minimizes conventional Type I agency conflicts (Uribe-Bohorqueza et al., 2018). However, family firms suffer Type II agency problems as the family members exploit the concentration of power in their hands which dilute the power and authority of minority shareholders – a cultural trait that exists across several developed and emerging markets. Considering the difference of agency issues of family and non-family firms we expect a different behaviour of family and non-family firms in restraining earnings management after the release of *regulations-2012*. We thus further categorized our sub-samples of voluntary adopters and mandatory adopters across family and non-family firms.

Therefore, to conduct our analysis, we categorized our sample into four sub-samples: (i) mandatory adopters family firms, (ii) mandatory adopters non-family firms, (iii) voluntary adopters family firms, and (iv) voluntary adopters non-family firms.

3.4. Measurement of increase/decrease in INEDs education

We argue that monitoring and advisory capacity of the INEDs would be more effective if the education level of newly appointed INEDs are greater than the education level of incumbent INEDs. We thus follow a standard procedure to measure the net increase/decrease in the overall level of INEDs education by matching the education level of newly appointed INEDs in response to *regulations-2012* with the incumbent INEDs. We expect that an overall increase (decrease) in INEDs education level would display a negative (positive) impact on earnings management practice. For example, if firm A has two INEDs with a Master's/PhD degree in the pre-regulation period and appoints another INED without a Master's/PhD degree (i.e., bachelor/below bachelors' degree) after the release of *regulations-2012*, the firm's percentage of INEDs with a Master's/PhD degree drops from 100% (= 2/2) to 66.7% (= 2/3) while the percentage of INEDs with a bachelor's degree goes up from 0% to 33.3%. In this situation, we consider it an overall decrease of 33.3% in the INEDs education.

In contrast, if firm B has two INEDs each with a bachelor/below bachelors' degree in the pre-regulation period and appoints another INED with a Master's/PhD degree, the percentage of INEDs with a bachelors' degree decreases from 100% (= 2/2) to 66.7% (= 2/3) while the percentage of INEDs with a Master's/PhD degree goes up from 0% to 33.3%, illustrating an overall increase of 33.3% in the INEDs education. We expect that the relationship between regulations-*2012* and earnings management would be insignificant (i.e. compliance perspective) or positive (i.e. entrenchment perspective) in the case of firm A due to the overall decrease in the level of INEDs education. While in the case of firm B, there will be a negative

(mitigating) impact of *regulations-2012* on earnings management (alignment/optimization perspective) considering its overall increase in the level of INEDs education.

4.5. Construction of Herfindahl Index

We measure the educational level heterogeneity by constructing the Herfindahl index based on the percentage of INEDs in one of three education categories: i) below bachelor's degree, ii) bachelor's degree, and iii) a Masters/PhD degree. Likewise, we measure the tenure level heterogeneity by constructing a Herfindahl index based on the level of INEDs tenure: i) below 5 years, ii) between 5-9 years (optimal level), and iii) above 9 years. As a standard, the Herfindahl index is an inverse measure, that is smaller (larger) values indicate greater (less) heterogeneity. We expect that a lower level of heterogeneity may enhance the monitoring and advising capacity of the INEDs. We estimate the Herfindahl index by taking the square level of education heterogeneity:

$$\text{HHI} = S_1^2 + S_2^2 + S_3^2 + \cdots S_n^2 \qquad (5)$$

3.6. Control variables

Following prior studies of INEDs and earnings management relationships, we included commonly used control variables (Roychowdhury, 2006; Uribe-Bohorqueza, 2018; Vafeas, 2003). These control variables are board size, CEO duality, the reputation of external auditors (BIG4), leverage, growth, firm size and operating cash flow. The definitions of the variables are explained in Table 1.

TABLE 1 ABOUT HERE

4. Model estimation

The literature shows that the optimal level of board structure is chosen endogenously by the firm (Farag & Mallin 2019; Raheja, 2005; Singh et al., 2018). For example, based on past year firm performance, the efficient CEOs may prefer to acquire the service of more qualified and industry-experienced INEDs with the aim of a certain level of targeted performance. Likewise, our evidence shows a sharp increase in the proportion of INEDs in response to the *regulations-2012* indicating that the board structure is endogenously determined by *regulations-2012.*

To investigate the impact of *regulations-2012* on earnings management, we rigorously address the potential sources of endogeneity using the following strategy. First, we employ DiD estimation by controlling industry fixed effects to account for unobservable characteristics, underlying industrial environments, and economic indicators such as market conditions and

competition which possibly derive the results (Adams and Ferreira 2007; Boone et al., 2007; Coles et al.,2008). Second, in accordance with the previous literature, we conduct the DWH (Durbin–Wu–Hausman) test which carries a null hypothesis (i.e., Ho: regressors are exogenous) to test the presence of endogeneity in the data set.

Third, we employ a two-step system dynamic GMM estimator to test the dynamic nature of board structure and address the potential source of endogeneity (Amin & Farquhar, 2021; Wintoki et al., 2012). For efficient and consistent estimation of the GMM estimator, it is required that the instruments used in the model are valid and exogenous as a group. Finally, for the robustness of our findings, we undertake the propensity score matching (PSM) technique to examine observable differences in firm characteristics across family firms and the matching variables of non-family firms.

4.1. Summary Statistics

Table 2 presents the summary statistics of the variables used in the study. Consistent with the prior studies (e.g., Demerjian et al., 2013; El-Helaly et al., 2018; El Diri., et al., 2020), the mean of REM across all the samples is zero because they are calculated as the residuals from the relevant equations reported in section 3.2. The mean value of INEDs in the case of family firms is higher than non-family firms for both the sample of Singapore and Vietnam. The mean value of Herfindahl Index Education and Herfindahl Index are relatively lower in mandatory adopters reflecting a greater heterogeneity. The mean value of INEDs education and Tenure are the highest in the case of non-family voluntary adopters of both the sample of Singapore and Vietnam. In terms of the control variable, there is no significant difference across the samples except the board size and BIG4 which are marginally higher in the case of Singapore.

TABLE 2 ABOUT HERE

Figure 1 shows that the average percentage of INEDs on boards during the sample period which is ranging between 22.4% for Singapore and 16.1% for Vietnam in 2008. This percentage dramatically increases after the introduction of *regulations-2012,* reaching 47.3% and 26.1% in 2012 for Singapore and Vietnam, respectively. This sharp increase in the proportion of INEDs indicates that the board structure is endogenously determined by the *regulations-2012.* Figure 1 also shows that the proportion of INEDs in the case of Vietnam is lower than the requirement of *regulations-2012*. In addition, it is also noticeable that following *regulations-2012,* the increase in the proportion of INEDs in Singapore is greater than that of Vietnam.

FIGURE 1 ABOUT HERE

Following the methodology explained in section 3.4 for the measurement of overall increase/decrease in INEDs education level after the release of *regulations-2012*, Table 3 presents the net increase/decrease in INEDs education during the periods of pre-regulations 2012 and post-regulation 2012. Panel A shows that in the case of Singapore, INEDs education of mandatory adopters family firms in the pre-regulation period regarding Masters/PhD, bachelor's and below bachelor's degrees are 25.03%, 40.91% and 34.09%, respectively.

Notably, the percentage of Masters/PhD education decreased up to 20.45% in the post-regulation period and as a result, the percentage of bachelor's and below bachelor's degrees increased by 38.64% and 40.91%, respectively. This indicates that mandatory adopters family firms of Singapore have appointed less educated INEDs to comply with *regulations-2012*. Likewise, INEDs education of mandatory adopters non-family firms of Singapore also displays a similar pattern, reflecting that the education level of INEDs decreases during post-regulation. In the case of Vietnam, there is also a decrease in Masters/PhD education by 18.33% and 29.14%, respectively for family and non-family firms during the post-regulation period.

Panel B shows the change in INEDs education during the post-regulation period for voluntary adopters of Singapore and Vietnam. A similar trend can be seen in the case of Singaporean family firms as the education level of INEDs regarding Masters/PhD degree falls from 30.01% to 27.78%. Interestingly, in the case of non-family voluntary adopters of Singapore, the master/PhD education level of INEDs in the pre-regulation period is 38.28% which increases during the post-regulation period up to 42.97%.

This analysis shows five important aspects regarding INEDs education. (1) The education level of INEDs of family firms is lower than that of non-family firms during the pre-regulations and post-regulation period. (2) The decrease in INEDs education level of family firms during the post-regulation period is greater than that of non-family firms. (3) Only non-family voluntary adopters of Singapore show an increase in INEDs education level in the post-regulation period which may have a mitigating impact on earnings management. (4) Voluntary adopters have more qualified INEDs than that of mandatory adopters. (5) Overall, the INEDs education level of Singaporean firms is higher than that of Vietnamese firms reflecting a better CG practice in Singapore.

Panel C shows INEDs' level of education within family firms, demonstrating that most of the family firm's board members do not hold a university degree. The statistics show that the co-founder of family firms have the lowest level of education i.e., (17.74%), followed by the other

family members (20.02%) and founder (24.56%). A similar trend can be seen for Vietnam firms as well.

Panel D presents INEDs tenure ranging between 2.19 years to 7.24 years. As previously noted, the prior literature indicates that the optimal level of INEDs tenure is 5-9 years (Alvarado & Bravo, 2017), while only non-family voluntary adopters of Singapore and Vietnam have an optimal level of INEDs tenure (e.g., 7.24 and 6.97 years, respectively). Finally, panel E shows a higher level of family founder and co-founders' tenures of Vietnam i.e., 23 and 22 years which are higher than that of Singapore i.e. 21 and 20 years. In addition, the family executive directors' tenure of Singapore and Vietnam are 9.5 and 8.9 years, respectively, while the duality of family firms is greater than non-family firms in both samples.

TABLE 3 ABOUT HERE

4.2. Diagnostic Tests

We begin our analysis with the diagnostic assessment of our model estimation across family and non-family firms. Table 4 shows country-level testing results of multicollinearity, heteroskedasticity, autocorrelation, and endogeneity. Column 1 of Table 4 shows that the mean values of the VIF test across all the sample countries are significantly lower than the threshold value of 10 which rejects the likelihood of multicollinearity. In addition, the data of all samples is also subject to Woolridge and Breusch-Pagan/Cook-Weisberg test for autocorrelation, and heteroskedasticity, respectively.

Column 2 shows that the p-value of the Woolridge test for autocorrelation is less than one (e.g., p-values < 1), demonstrating that the residuals of samples are autocorrelated to their respective first order, which in turn, rejecting the null hypothesis, leading to the absence of AR (1). Column 3 shows that the p-value is less than one (e.g., p-values < 1), rejecting the null hypothesis of Breusch-Pagan/Cook-Weisberg test of heteroskedasticity i.e., 'constant variance' (error variances are all equal) hence confirming the presence of heteroskedasticity across sample countries. Finally, we examine the presence of endogeneity by employing the Durbin-Wu-Hausman test which shows the significance of p-values suggesting the presence of endogeneity. We, therefore, preferred the GMM estimator over static models to address the potential sources of endogeneity.

TABLE 4 ABOUT HERE

5. Results and discussion

5.1. Role of regulations (2012) in mitigating earnings management

Before 2012, Singapore and Vietnam did have not any mandatory requirement for the INEDs, but since 2012, listed firms are required to have one-third of the board members as INEDs which resulted in a dramatic increase in the percentage of INEDs in the board composition exhibit in figure 1. We thus concentrate on governance regulations 2012 in Singapore and Vietnam as a natural exogenous shock to prob the relationship between INEDs and earning management.

We begin our econometric analysis by employing the DiD estimation technique to capture the impact of *regulations-2012* on earnings management and present the results in Table 5. The DiD is a quasi-experimental estimation technique used in the literature to compare the changes in outcomes over time by studying the differential effects of a treatment on a targeted 'the treatment group' and ' the control group'. To this end, we use the release of *regulations-2012* as a natural exogenous shock to investigate whether two groups of firms – one group being affected by the governance regulations (the treatment group) and the other group not being impacted (the control group).

We callsified our sample for Singapore and Vietnam across family and non-family firms. include an indicator variable '*Treated'* to account for the treatment group that equals 1 if a firm has an increase in the percentage of INEDs after 2012 as compared with the previous year and equal to 0 if there is no change in the percentage of INEDs. We also incorporate the *'post_regulation'* as an indicator variable that equals 1 if the sample year is 2012 or later, and 0 otherwise. As an estimation procedure of DiD, we used the coefficient of *'Treated*Post-regulation'* to capture the impact of an increased proportion of INEDs on earnings management in response to *regulations-2012*. In order to remove any bias between the treatment and control group due to difference of parameters across firms or the variation over time difference we included include firm fixed-effects and time fixed-effects. This arrangement alleviates the potential source of endogeneity as the change in the INEDs is triggered by new governance regulations.

$$EM_{it} = Treated_i * Post\_regulations_t + \beta * Control + d_i + d_t + \varepsilon_{it} \quad (6)$$

Table 5 shows that the coefficient of *Treated*Post-regulation'* is neatively significant in the case of Model 1-2 (family and non-family firms of Singapore) and Model 4 (non-family firms of Vitenam) reflecting that the increase in the proportion of INEDs in response to governance

regulations 2012 resulted in restranning earnings management supporting the alignment/optimization perspective.

In contrast, Model 3 of Table 5 (family firms of Vitenam) show that the interaction term '*Treated*Post_regulations'* is insignificant (β = -0.351), indicating that the *regulations-2012* have no impact on earnings management supporting the 'compliance perspective'. This result shows that family firms of Vitenam tend to appoint the INEDs merely for compliance purposes i.e. following a tick-box approach hence the increase in the number of INEDs in response to the *regulations-2012*, does not impact earnings management. In addition, this reflect that the INEDs are not independent in the true sense as the powerful families limit their control function by developing a coalition with them, which in turn, limit the mitigating impact on earning management.

TABLE 5 ABOUT HERE

5.2. Impact of INEDs education and tenure on earnings management

Before the estimation of moderating effects of INEDs characteristics (i.e. INEDs education and INEDs' tenure) on the relationship between *regulations-2012* and earnings management, we first assess the direct impact of INEDs education and tenure on earnings management using dynamic GMM estimator.

Table 6 shows that the coefficients on *regulations-2012* and INEDs are insignificant across models 1 and 2 (e.g. mandatory adopters family and non-family firms of Singapore). This result indicats that sample firms have not appointed the truly independent INEDs in response to the mandatory requirement of *regulations-2012* which resulted in an insignificant impact on earnings management. This result shows that mandatory adopters tend to appoint the INEDs merely for compliance purposes, thereby increasing the proportion of INEDs in response to the *regulations-2012*, which in turn, does not impact earnings management. The coefficients on *regulations-2012* and INEDs of models 3 and 4 (e.g., voluntary adoptors family and non-family firms of Singapore) are negatively significant reflecting that release of *regulations-2012* strengthens the monitoring capacity of INEDs, which in turn, mitigate earnings management.

In the case of the Vietnam sample, the coefficients on *regulations-2012* and INEDs are insignificant across models 5, 6 and 7 (mandatory adopters family and non-family firms and voluntary adopters family firms) indicating that *regulations-2012* pushed the firms towards the mandatory requirements of INEDs, while the controlling shareholders develop a coalition with INEDs for the extraction of private benefits which offset the mitigating impact of *regulations-*

2012 on earnings management. While Model 8 (i.e. voluntary adopters non-family firms of Vietnam) shows that the coefficients on *regulations-2012* and INEDs are significantly negative indicating that the *regulations-2012* has a mitigating impact on earnings management supporting the 'alignment/optimization perspective'. Based on this result we accept hypothesis H1a for mandatory adopters family and non-family firms of Singapore and Vietnam and voluntary adoptors family firms of Vietnam. In addition, we accept the hypothesis H1c for voluntary adopters family and non-family firms of Singapore and voluntary adopters family firms of Vietnam.

The coefficient on INEDs education and tenure are significantly negative for models 3, 4 and 8 (e.g., voluntary adoptors family and non-family firms of Singapore and voluntary adopters non-family firms of Vietnam). We argue that these firms recognize the significance of truly impartial INEDs and hence voluntarily opt for a large proportion of board members as INEDs even before the release of *regulations-2012*. In addition these firms INEDs have an optimal level of tenure which mitigates the earnning management. We argue that longer-tenure INEDs have the opportunity to understand the firm internal environment which enhances their ability to provide more informed advice to the corporate board. We find that Vietnam firms have a substantial decrease in INEDs education and have a suboptimal level of INEDs tenure leading to an insignificant impact of *regulations-2012* on earnings management.

Moreover, we relate these result with descriptive analysis of Table 3 showing that there is increase in education level of INEDs (e.g., these firms appointed more quaifed INEDs) after the release of *regulations-2012* and these firms have optimal level of tenure of their INEDs which mitigates the earnning management practices. Based on these findings we accepts the hypothesis H2a and H3a for voluntary adoptors family and non-family firms of Singapore and voluntary adopters non-family firms of Vietnam. We also accept the hypothesis H2b and H3b form mandatory adoptars family and non family of Singapore and Vietnam.

Likewise, the results shows a similar trend for Herfindahl Index of education and tenure which are negatively significant in the case of Model 3, 4 and 7 (voluntary adoptors family and non-family firms of Singapore and voluntary adopters non-family firms of Vietnam) reflecting that education and tenure heterogeneity are strengthening the monitoring capacity of INEDs which in turn, mitigate earnings management.

Turning to the control variables, the results are as per the expectation and not significantly different across sample firms. For example, the coefficient on board size is negatively significant supporting the argument that it is difficult for a larger board to reach a consensus

on important decisions hence a smaller board tend to reduce earnings management. There is an insignificant impact of CEO duality and leverage while the reputation of external auditors (BIG4) negatively influences the earnings management practice. Growth is positively significant supporting the notion that high-growth firms may have internal control issues, which in turn, affect the monitoring capacity of the corporate board. Firm size remained insignificant across all the samples while Firm age is negatively significant and operating cash flow (OCF) is positively significant indicating that firms with higher operating cash flow tend to be more opportunistic and involved in earnings management.

TABLE 6 ABOUT HERE

5.3. Moderating effects of INEDs education and tenure on the relationship between regulations-2012 and earnings management:

We next estimate the moderating effect of INEDs education and tenure on the relationship between *regulations-2012* and earnings management and present the results in Table 7 and Table 8 for Singapore and Vietnam, respectively. We proceed with a stepwise estimation by the inclusion of interaction terms in each model, while Model 3, 6, 9, and 12 of each respective sample includes all interaction terms for Singaporean firms. Accordingly, we rely on Models 3, 6, 9, and 12 of each sample to determine whether the respective hypotheses are supported or not. The results of Model 3 and 6 of Table 7 (e.g. mandatory adopters family and non-family firms of Singapore) show that the coefficients on the interaction term of INEDs education (*Regulations-2012* INEDs education*) (β = 0.471) and INEDs tenure (*Regulations-2012* INEDs' Tenure*) (β = -0.362) are insignificant. This result supports the findings of DiD and GMM estimations reported in Tables 5 and 6, respectively. In contrast, Model 9 and 12 (voluntary adopters family and non-family firms of Singapore) shows that the coefficient on the interaction term of INEDs education and tenure negatively moderates the relationship between *regulations-2012* and earnings management. This reflects the higher level of INEDs education and optimal level of tenure strengthen the mitigating impact of *regulations-2012* on earnings management.

Table 7 ABOUT HERE

Table 8 shows the moderating effect of INEDs education and tenure in the case of Vietnam firms. Model 3 and 6 and 9 shows that the coefficients on the interaction term of INEDs education and tenure are insignificant indicating that the decrease in INEDs education and suboptimal tenure of INEDs offset the monitoring impact of *regulations-2012* on earnings management. We argue that the role of INEDs is more likely to be compromised particularly when controlling shareholders consolidate power and authority which adversely affect the

boards' overall monitoring effectiveness. In contrast, Model 12 (i.e. voluntary adopters non-family firms of Vietnam) shows that the coefficient on the interaction term of INEDs education and tenure are negatively significant reflecting that *regulations-2012* has a substantial mitigating impact on the relationship between INEDs education, tenure and earnings management. Moreover, the coefficients on control variables are almost similar to those reported in table 5.

TABLE 8 ABOUT HERE

5.4. Robustness tests

To further test the robustness of our results, we employed the propensity score matching technique (PSM) to address potential sources of endogeneity and examine the observable differences between the characteristics of the founder family firms and the matching variables of non-family firms. We employ the nearest neighbour approach with common and replacement support covering a maximum distance of up to 1% (Farag & Mallin 2019) and present the results in Table 9.

Panel A shows the univariate analysis of both samples i.e. Singapore and Vietnam indicating the difference in the mean test between founder family firms (Treated) and the non-family firms (Control) by incorporating the matching variables. The univariate analysis shows that there is no significant difference between the founder family firms and the matching variables of non-family firms. This analysis also illustrates that earnings management practice is more pronounced in family firms hence *regulations-2012* is less effective in curbing earnings management across family firms.

In addition, we estimate the PSM technique by employing the logit model for the presence of founder family firms in each of our sample observations. We control the firm's specific characteristics such as board size, CEO duality, BIG4, leverage, growth, firm size and operating cash flow. As an estimation procedure of PSM, for all founder family firms, we chose a 'nearest neighbour' matching firm for each year. After matching with replacement, we determine a tolerance level up to 0.01 in terms of the maximum propensity score for the avoidance of bad matches.

Panel B of Table 9 shows the multivariate analysis to test the findings of Panel A. Models 1 and 2 present the results of pooled OLS using the full data set, while model 3 shows founder family firms and their respective non-family matched sample for Singaporean firms while model 4-6 shows the findings of Vietnam sample. The results are congruent with the univariate analysis and fixed effect estimation of panel A reflecting that there is no significant difference

between the samples, i.e., founder family firms and the matching variables of non-family firms across the sample periods.

Further, in our unreported analysis, we determine whether the relationship between tenure and earnings management is consistent or its change at a certain point (e.g. above nine years), and as a result, positively/negatively associated with earnings management. In this regard, we re-estimate the model by incorporating the squared value of tenure in our model estimation to determine whether there is a monotonic (inverted U-shape) relationship between INEDs tenure and earnings management. Our unreported results show that the coefficient on tenure is significantly negative while the squared value of tenure remained insignificant across all the models reflecting that there is no monotonic relationship between INEDs tenure and earnings management. Note: As a further robustness test we divide the sample firms into large and small groups and have re-run the regression model and found that the original findings still hold.

TABLE 9 ABOUT HERE

6. Conclusion

In this study, we exploit the exogenous changes in the proportion of INEDs in response to the *regulations-2012* of Singapore and Vietnam to estimate the effectiveness of *regulations-2012* in restraining earnings management. In addition, we estimate the direct impact and the moderating effect of two important characteristics of INEDs, education and tenure on earnings management that have not been discussed in the literature as the elements of board independence in restraining earnings management. To estimate the direct impact of INEDs on earnings management, we incorporate three distinct perspectives about the role of INEDs in restraining earnings management namely compliance perspective, entrenchment perspective, and the alignment/optimization perspective.

Our core findings show a significant negative relationship between *regulations-2012* and earnings management supporting 'alignment/optimization perspective' in the case of voluntary adopters of both the samples i.e. Singapore and Vietnam. We show that voluntary adopters have a higher level of INEDs education and an optimal level of tenure which enhances the monitoring and advisory capacity of INEDs leading to a decrease in earnings management. While in the case of Vietnam, only non-family voluntary adopters have a mitigating impact on earnings management.

In contrast, we find an insignificant impact of *regulations-2012* on earnings management in the case of mandatory adopters supporting the 'compliance perspective' for both sample i.e. Singapore and Vietnam. We argue that *regulations-2012* pushed the firms towards the

mandatory requirements of INEDs which for many firms are beyond the optimal composition of corporate boards leading to an insignificant impact on earnings management. To this end, we report that mandatory adopters recruited INEDs who develop a coalition with the controlling shareholders, which in turn, offset the mitigating impact of *regulations-2012* on earnings management.

We report that merely increasing the number of INEDs will not always lead to better monitoring capacity while the effectiveness of the board independence in restraining earnings management is directly associated with the INEDs education and tenure. To this end, we report that in the case of voluntary adopters a higher level of INEDs education and optimal tenure mitigate the earnings management practice. In contrast, INEDs with a lower education level and suboptimal tenure collude with powerful controlling actors leading to a lower monitoring capacity, which in turn, increases earnings management ─ the case of mandatory adopters.

We argue that a higher level of INEDs education tends to enhance the knowledge and expertise to understand the boards' strategic orientation which reduces the earnings management. Moreover, INEDs require adequate time to understand the corporate environment and firm long-term objectives hence an optimal level of tenure leads to a mitigating impact on earnings management. Therefore, longer-tenure INEDs with better formal education have the comparative advantage to provide more informed advice to the corporate board.

Our analysis also finds a significant negative moderating impact of INEDs education and tenure on the relationship between *regulations-2012* and earnings management in the case of voluntary adopters. While there is no moderating impact in the case of mandatory adopters indicating that the decrease in INEDs education and suboptimal tenure of INEDs offset the monitoring impact of *regulations-2012* on earnings management. Moreover, a longer tenure tends to add expertise on the part of INEDs to manage the complex issues of the board which enhances their engagement with strategic decision making. Further, we contribute to the theoretical literature of CG by providing evidence that a lower level of INEDs education and tenure strengthens the ultimate power of the CEO and dominant controlling shareholders leading to Type II agency conflicts.

Overall, our results show that the introduction of *regulations-2012* has a stronger mitigating impact on earnings management in Singapore than in Vietnam. We relate this conclusion with the fact that the Singaporean corporate sector achieves top ranking across Asia in terms of best CG practices while the CG practice in Vietnam firms is still in the developing stage whilst their CG score is lower than that of other markets across the Asian region. In addition, family firms

of both the sample i.e. Singapore and Vietnam have a relatively lower level of INEDs education and tenure, which in turn, weakens the mitigating impact of *regulations-2012* on earnings management. This result is consistent with the findings of Wang (2006) focuses on the entrenchment hypothesis and suggests that family-controlled businesses are relatively more involved in REM.

6.1. Implications of the study

Our analysis suggests a clear policy implication for regulators and policymakers. Our findings suggest that regulators need to set a minimum education level for the appointment of INEDs, together with a provision regarding the maximum tenure of INEDs to enhance the board monitoring function. We also recommend to the regulators and policymakers that the standard rule of a one-third proportion of INEDs in the board composition is not applicable on all boards as the optimal level of board independence differs across firms based on their specific structure, industry dynamics and internal CG mechanisms. We also recommend that the compliance requirements of maintaining the one-third proportion of INEDs in Singapore and Vietnam are not consistent with the required professional expertise of INEDs.

Our findings provide new avenues for future research. For example, it would be beneficial for future researchers to examine multiple controlling shareholders and determine their moderating effects regarding *regulations 2012*. Moreover, agency theory can be extended to explore the impact of board independence on earnings management by incorporating other INEDs characteristics such as age and gender.

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Table 1 Definition of variables

Variable	Definition
REM	The aggregate of three standardised residuals of AB_CFO, AB_PROD and AB_DE, in which AB_CFO is the abnormal level of operating cash flow, AB_PROD is the abnormal level of production, and AB-DE is an abnormal level of discretionary expenses (including selling, admin and general expenses, research & development expenses, and advertising expense).
INEDs	The ratio of independent non-executive directors to the total number of directors on the board
INEDs' Education	Formal education of independent non-executive directors
INEDs' Tenure	The average number of years of independent non-executive directors on a board
Herfindahl Index Education	The square value of Heterogeneity in INEDs Education i.e. HHI $= S_1^2 + S_2^2 + S_3^2 + \cdots S_n^2$
Herfindahl Index Tenure	The square value of Heterogeneity in INEDs Tenure i.e. HHI $= S_1^2 + S_2^2 + S_3^2 + \cdots S_n^2$
Regulations-2012	Binary variable value 1 if the sample year is 2012; 0 otherwise
Family Founder tenure	The average number of years of the family founder on a board
Family Co-founder tenure	The average number of years of family co-founder on a board
Voluntary adopters	Firms that voluntarily appointed a minimum of one-third of the board members as INEDs before the introduction of *regulations-2012*
Mandatory adopters	Firms that did not voluntarily appoint one-third of the board members as INEDs before the introduction of *regulations-2012*. These firms appointed a minimum of one-third of the board members as INEDs when it became a mandatory requirement after the release of *regulations-2012*
BIG 4	Binary variable value 1 if a firm is audited by a Big 4 auditor, 0 otherwise.
Sales Growth	The ratio of current year's sales minus previous year's sales, divided by previous year's sales
Leverage	The ratio of a firm's debt to its total assets
Firm Size	The natural logarithm of book value of total assets
Firm Age	The natural logarithm of the number of years a firm has been established
Operating Cash Flow (OCF)	Operating income before depreciation minus working capital divided by lagged total assets. Working capital is current assets minus current liabilities.

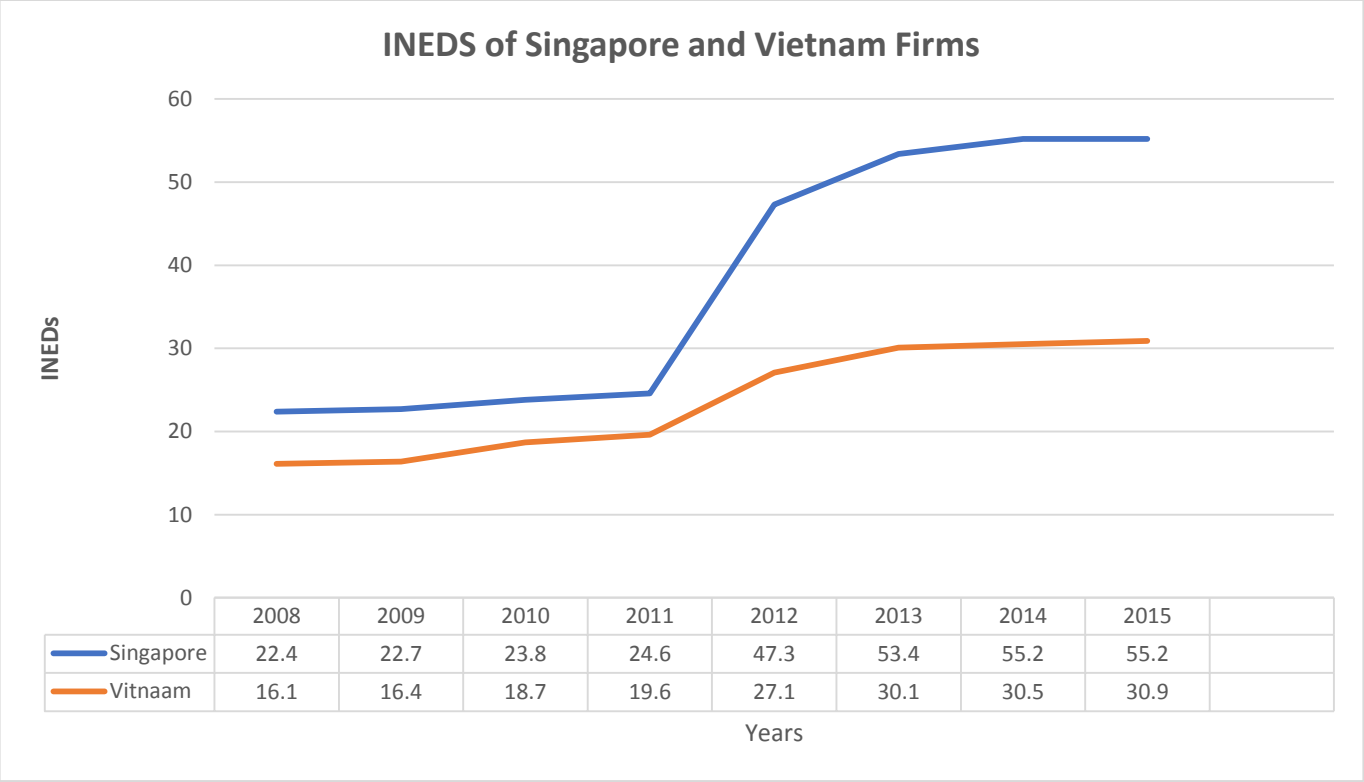
Table 1 shows the definition of the variables used in the study.

Table 2 Summary statics

Panel A: (Singapore)	Mandatory adopters				Voluntary adopters			
	Family		Non-Family		Family		Non-Family	
Variables	Mean	SD	Mean	SD	Mean	SD	Mean	SD
REM	0.002	0.121	0.001	0.113	0.000	0.165	0.000	0.181
INEDs	39.70	0.213	38.31	0.271	37.50	0.211	36.70	0.2031
Herfindahl Index Education	0.350	0.271	0.390	0.242	0.38.3	0.225	0.417	0.161
Herfindahl Index Tenure	0.241	0.221	0.262	0.252	0.284	0.261	0.292	0.243
INEDs' Education	23.1	4.87	29.2	4.62	32.1	5.52	33.1	5.91
INEDs' Tenure	3.19	1.51	4.27	1.37	4.21	1.05	7.24	2.10
Board Size	7.11	1.59	6.95	1.31	7.10	1.21	6.90	0.95
CEO Duality	0.37	0.41	0.29	0.41	0.38	0.39	0.28	0.33
BIG 4	0.18	0.35	0.234	0.29	0.193	0.31	0.26	0.31
Leverage	0.19	17.1	0.19	17.1	0.195	17.1	0.18	17.1
Growth	4.26	0.08	3.29	0.06	4.11	0.05	3.21	0.07
Firm Size	19.35	8.22	19.25	9.15	19.16	9.22	19.14	8.37
Firm Age	2.69	0.61	2.68	0.62	2.69	0.61	2.68	0.62
OCF	0.14	0.11	0.16	0.19	0.19	0.22	0.18	0.16
Panel B: (Vietnam)	Mandatory adopters				Voluntary adopters			
	Family		Non-Family		Family		Non-Family	
Variables	Mean	SD	Mean	SD	Mean	SD	Mean	SD
REM	0.003	0.127	0.001	0.141	0.001	0.139	0.000	0.125
INEDs	26.15	0.261	25.19	0.225	23.10	0.181	23.57	0.228
Herfindahl Index Education	0.292	0.251	0.318	0.223	0.334	0.195	0.356	0.186
Herfindahl Index Tenure	0.211	0.271	0.232	0.261	0.254	0.221	0.282	0.215
INEDs' Education	19.1	4.06	22.2	4.11	24.1	4.76	26.3	6.41
INEDs' Tenure	3.26	1.53	4.54	1.19	4.21	1.34	6.97	2.11
Board Size	6.11	1.21	5.90	1.20	6.10	1.17	5.90	0.13
CEO Duality	0.38	0.22	0.33	0.21	0.33	0.19	0.27	0.20
BIG 4	0.17	0.37	0.21	0.27	0.24	0.26	0.25	0.28
Leverage	0.22	18.1	0.20	15.1	0.21	18.2	0.23	18.4
Growth	4.73	0.06	4.22	0.07	4.10	0.06	3.44	0.05
Firm Size	18.25	8.53	18.15	7.59	18.22	8.53	18.20	9.11
Firm Age	2.65	0.63	2.64	0.63	2.65	0.64	2.64	0.63
OCF	0.16	0.13	0.14	0.12	0.18	0.14	0.19	0.15

Notes: summary statists of the variables used in the study.

Figure.1



	2008	2009	2010	2011	2012	2013	2014	2015
Singapore	22.4	22.7	23.8	24.6	47.3	53.4	55.2	55.2
Vitnaam	16.1	16.4	18.7	19.6	27.1	30.1	30.5	30.9

Notes: Graphic description of INEDs across sample period.

Table 3. Summary statistics	Singapore				Vietnam			
Panel A: Mandatory adopters	Pre-regulation		Post-regulation		Pre-regulation		Post-regulation	
Level of Education	Family	Non-Family	Family	Non-Family	Family	Non-Family	Family	Non-Family
Master's /PhD	25.03	35.42	20.45	31.25	22.51	30.12	18.33	29.14
Bachelor's	40.91	35.41	38.64	37.5	43.72	40.21	40.32	35.04
Below Bachelor's	34.06	29.17	40.91	31.25	33.77	29.67	41.35	35.82
Panel B: Voluntary adopters	Pre-regulation		Post-regulation		Pre-regulation		Post-regulation	
Level of Education	Family	Non-Family	Family	Non-Family	Family	Non-Family	Family	Non-Family
Master's /PhD	30.01	38.28	31.78	42.97	27.32	35.21	25.66	35.19
Bachelor	35.56	34.38	30.44	35.16	38.44	31.29	32.67	35.98
Below Bachelor	34.44	27.34	37.78	21.88	34.24	33.5	41.67	28.85
Panel C: Education within family boards	Singapore				Vietnam			
INEDs' Education level	Founder	Co-Founder	Other Family	Non-Family	Founder	Co-Founder	Other Family	Non-Family
Master's /PhD	24.56	17.74	20.02	31.25	22.43	15.65	19.32	30.54
Bachelor's	22.81	19.35	40	40.91	24.44	21.43	42.77	43.74
Below Bachelor's	52.63	62.9	40	27.84	53.13	62.92	37.91	25.72
Panel D: INEDs Tenure	Singapore				Vietnam			
INEDs' Tenure:	Mean	SD	Mini	Maxi	Mean	SD	Mini	Maxi
Family Mandatory adopters	3.19	1.32	1	10	3.29	1.11	1	10
Family Voluntary adopters	6.21	1.75	1	8	4.08	1.37	1	8
Non-Family Mandatory adopters	4.27	1.1	1	12	4.54	1.1	1	12
Non-Family Voluntary adopters	7.24	3.11	1	13	6.97	2.98	1	12
Panel E: Family Firms attributes	Singapore				Vietnam			
Family Founder tenure (Average)	21 Years				23 Years			
Family Co-founder tenure (Average)	20 Years				22 Years			
Family executive directors' tenure (Average)	9.5 Years				8.9 Years			
CEO Duality Family firms	37.5%				35.5%			
CEO Duality Non-Family firms	28.5%				30 %			

Notes: Data are obtained from firms' individual annual reports and supplemented by Worldscope 'One Banker' (Ownership module). The analysis is based on researcher calculations.

Table 4: Country-level diagnosing testing

Sample	**VIF Statistics**	**Woolridge**	**Breusch − Pagan**	**Durbin Wu Hausman Test**
	Mean VIF	**f-statistic (p-value)**	**χ2 (p-value)**	**t-stat (p-value)**
Singapore (Family)	1.51	22.6***	15.3*	2.51**
Singapore (Non-Family)	1.36	15.1**	10.7*	1.72*
Vietnam (Family)	1.45	15.4*	15.6*	2.39*
Vietnam (Non-Family)	1.72	13.2*	13.3***	3.62**

Notes: Table 4 presents the testing results of multicollinearity, heteroskedasticity, autocorrelation and endogeneity across sample countries.

Table 5. Difference in difference estimation (DiD)

Dependent variable: Earnings Management	**Singapore**		**Vietnam**	
	Family	**Non-Family**	**Family**	**Non-Family**
	(1)	(2)	(3)	(4)
Treated*Post regulations	-0.561*	-0.432***	-0.351	-0.406**
	(0.072)	(0.000)	(0.211)	(0.031)
INEDs	-0.355*	-0.411**	-0.372	- 0.431**
	(0.099)	(0.041)	(0.198)	(0.041)
Herfindahl Index Education	-0.322*	-0.255***	-0.342	-0.217***
	(0.091)	(0.000)	(0.104)	(0.001)
Herfindahl Index Tenure	-0.321*	-0.521***	-0.172	-0.219**
	(0.083)	(0.000)	(0.129)	(0.044)
INEDs' Education	-0.321*	-0.422**	-0.341*	-0.359***
	(0.091)	(0.023)	(0.097)	(0.000)
INEDs' Tenure	-0.362*	-0.266***	-0.345	-0.452***
	(0.093)	(0.000)	(0.143)	(0.000)
Board Size	-0.422***	-0.399*	-0.499***	-0.402*
	(0.000)	(0.071)	(0.000)	(0.084)
CEO Duality	-0.371	-0.433	-0.290*	-0.299
	(0.222)	(0.388)	(0.098)	(0.222)
BIG 4	-0.322*	-0.290*	-0.233*	-0.282**
	(0.071)	(0.055)	(0.088)	(0.012)
Leverage	0.222	0.210	0.298	0.387
	(0.201)	(0.210)	(0.167)	(0.277)
Growth	0.331*	0.335**	0.412*	0.325*
	(0.071)	(0.022)	(0.076)	(0.083)
Firm Size	0.266	0.312	0.389	0.265
	(0.201)	(0.175)	(0.229)	(0.142)
Firm Age	-0.352*	-0.421**	-0.392**	-0.231***
	(0.091)	(0.022)	(0.012)	(0.000)
OCF	0.322*	0.242*	0.221***	0.211*
	(0.081)	(0.099)	(0.000)	(0.077)
R-sq	0.58	0.61	0.57	0.49

Notes: The Table report the impact of regulations 2012 on earning management by using the difference-in-differences (DID) estimation across the compliances and non-compliances firms. ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$; two-tailed tests. Year and Industry Fixed effects included.

Table 6. Impact of INEDs education and tenure on earnings management

	Singapore				Vietnam			
Dependent Variable: Earning Management	Mandatory adopters		Voluntary adopters		Mandatory adopters		Voluntary adopters	
	Family	Non-Family	Family	Non-Family	Family	Non-Family	Family	Non-Family
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Regulations-2012	-0.219	-0.232	-0.433*	-0.534*	-0.372	-0.349	-0.328	-0.322***
	(0.138)	(0.211)	(0.092)	(0.074)	(0.151)	(0.124)	(0.243)	(0.000)
INEDs	-0.399	-0.361	- 0.288**	-0.211**	- 0.321	-0.213	-0.532	- 0.261***
	(0.128)	(0.112)	(0.032)	(0.047)	(0.121)	(0.212)	(0.165)	(0.000)
Herfindahl Index Education	-0.423	-0.301	-0.499*	-0.423**	0.429	0.421	-0.412	-0.367**
	(0.252)	(0.223)	(0.087)	(0.033)	(0.176)	(0.161)	(0.172)	(0.022)
Herfindahl Index Tenure	-0.363	0.651	-0.402*	-0.411*	-0.202	-0.513	-0.233	-0.232*
	(0.156)	(0.232)	(0.063)	(0.067)	(0.101)	(0.322)	(0.167)	(0.076)
INEDs' Education	-0.388	-0.233	-0.373**	-0.406*	0.721	0.242	-0.401	- 0.233**
	(0.222)	(0.131)	(0.099)	(0.072)	(0.144)	(0.172)	(0.128)	(0.049)
INEDs' Tenure	-0.296	-0.342	-0.278***	-0.524***	- 0.312	-0.233	-0.232	-0.299*
	(0.212)	(0.122)	(0.000)	(0.001)	(0.101)	(0.146)	(0.229)	(0.081)
Board Size	-0.304**	-0.287***	-0.512*	-0.352***	-0.265***	-0.189*	-0.125*	-0.387**
	(0.039)	(0.000)	(0.061)	(0.000)	(0.000)	(0.085)	(0.086)	(0.041)
CEO Duality	-0.232	-0.422	-0.504	-0.267	-0.232	-0.428	-0.452	0.133
	(0.191)	(0.191)	(0.281)	(0.282)	(0.173)	(0.202)	(0.199)	(0.112)
BIG 4	-0.023***	-0.225***	-0.132***	-0.272*	-0.322***	-0.211***	-0.186***	-0.134*
	(0.001)	(0.000)	(0.000)	(0.042)	(0.001)	(0.001)	(0.000)	(0.066)
Leverage	-0.207	-0.166	-0.331	-0.352	-0.322	-0.361	-0.302	-0.352
	(0.124)	(0.211)	(0.121)	(0.219)	(0.208)	(0.212)	(0.184)	(0.224)
Growth	0.355***	0.321***	0.373*	0.391*	0.204***	0.362***	0.334*	0.346*
	(0.000)	(0.001)	(0.071)	(0.072)	(0.001)	(0.001)	(0.099)	(0.072)
Firm Size	0.267	0.272	0.291	0.302	0.299	0.264	0.218	0.304
	(0.175)	(0.189)	(0.134)	(0.254)	(0.196)	(0.118)	(0.124)	(0.164)
Firm Age	-0.422**	-0.419**	-0.321***	-0.491**	-0.399***	-0.251***	-0.252*	-0.322*
	(0.012)	(0.021)	(0.000)	(0.020)	(0.001)	(0.000)	(0.099)	(0.087)
OCF	-0.237***	-0.321***	-0.399*	-0.233*	-0.275***	-0.233***	-0.312*	-0.353*
	(0.000)	(0.001)	(0.074)	(0.092)	(0.001)	(0.001)	(0.022)	(0.056)
REM (t-1)	0.853***	0.862***	0.814*	0.803**	0.851***	0.823*	0.882*	0.862*
	(0.000)	(0.000)	(0.063)	(0.074)	(0.000)	(0.001)	(0.093)	(0.074)
Observations	560	530	604	736	985	580	435	715
AR (1) (p-value)	0.02	0.04	0.02	0.03	0.04	0.02	0.04	0.05
AR (2) (p-value)	0.88	0.72	0.49	0.67	0.83	0.64	0.53	0.32
Hansen test	0.43	0.54	0.43	0.33	0.42	0.53	0.66	0.52
Difference in Hansen test	0.53	0.44	0.65	0.77	0.57	0.37	0.78	0.46

Notes: Table 8 estimate the Impact of INEDs education and tenure on earnings management. ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$; two-tailed tests. Arellano and Bond (1991), first-order autocorrelation AR (1), second-order autocorrelation AR (2) and the Hansen test of over-identifying restrictions to examine the validity and strength of instruments used in the level equation. Estimated p-values are in parentheses. *, **, and *** represent significance at 10%; 5% and 1% level respectively.

Table 7. Moderating effect of INEDs education and tenure on regulations-2012 (Singapore)

	Mandatory adopters						Voluntary adopters					
Dependent Variable: EM	Family			Non-Family			Family			Non-Family		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Regulations-2012	-0.336	-0.310	-0.435	-0.234	-0.326	- 0.251	-0.222*	-0.387*	-0.235	-0.493*	- 0.411**	-0.524*
	(0.123)	(0.124)	(0.211)	(0.135)	(0.101)	(0.126)	(0.087)	(0.071)	(0.225)	(0.099)	(0.026)	(0.059)
INEDs	-0.216	-0.355	0.222	-0.403	-0.221	- 0.346	-0.324**	-0.206**	-0.334	- 0.362*	- 0.391*	-0.413**
	(0.203)	(0.172)	(0.213)	(0.176)	(0.142)	(0.145)	(0.034)	(0.041)	(0.196)	(0.077)	(0.085)	(0.021)
Herfindahl Index Education	- 0.391	-0.424	0.483	-0.841	-0.299	-0.241	-0.307*	-0.311**	-0.308	-0.277*	-0.231***	-0.345*
	(0.301)	(0.150)	(0.120)	(0.142)	(0.201)	(0.163)	(0.074)	(0.041)	(0.166)	(0.066)	(0.000)	(0.097)
Herfindahl Index Tenure	-0.335	- 0.398	-0.611	-0.234	- 0.411	-0.432	-0.381***	- 0.401**	-0.374	- 0.498***	-0.473**	-0.433**
	(0.167)	(0.242)	(0.211)	(0.124)	(0.144)	(0.198)	(0.000)	(0.011)	(0.100)	(0.000)	(0.027)	(0.042)
INEDs' Education	-0.287	-0.398	0.304	-0.331	- 0.832	-0.177	-0.812*	-0.855*	-0.832	-0.422	- 0.422*	-0.441*
	(0.201)	(0.141)	(0.121)	(0.198)	(0.300)	(0.102)	(0.082)	(0.066)	(0.231)	(0.265)	(0.055)	(0.061)
INEDs' Tenure	-0.243	-0.349	-0.361	-0.304	-0.428	-0.853	-0.306*	-0.543*	- 0.541	-0.296*	-0.249*	-0.287**
	(0.122)	-0.265	(0.286)	(0.165)	-0.201	(0.286)	(0.099)	(0.077)	(0.241)	(0.011)	(0.065)	(0.042)
Regulations-2012 * INEDs' Education	-0.491		-0.471	-0.542		-0.422	-0.397**		-0.326*	-0.289*		-0.261**
	(0.176)		(0.201)	(0.131)		(0.177)	(0.021)		(0.075)	(0.098)		(0.021)
Regulations-2012 * INEDs' Tenure		-0.351	-0.362		- 0.402	-0.421		-0.234**	-0.201***		-0.313*	-0.333*
		-0.179	-0.189		(0.124)	-0.181		(0.033)	(0.000)		(0.067)	(0.067)
Board Size	-0.256*	-0.381*	-0.213*	-0.205	-0.345**	-0.261*	-0.375	-0.222*	-0.421*	-0.523*	-0.322	-0.331***
	(0.092)	(0.078)	(0.077)	(0.191)	(0.044)	(0.063)	(0.203)	(0.063)	(0.054)	(0.057)	(0.276)	(0.000)
CEO Duality	-0.370	- 0.336	-0.219	-0.223	-0.244	-0.321	-0.415	- 0.399	- 0.811	-0.412	-0.436	-0.471
	(0.141)	(0.282)	(0.163)	(0.201)	(0.164)	(0.132)	(0.213)	(0.139)	(0.143)	(0.101)	(0.146)	(0.210)
BIG 4	-0.281***	-0.313*	-0.333**	-0.350**	-0.432*	-0.486***	-0.306***	-0.375*	-0.256*	-0.343	-0.421*	-0.822*
	(0.000)	(0.071)	(0.035)	(0.033)	(0.098)	(0.000)	(0.000)	(0.065)	(0.052)	(0.157)	(0.078)	(0.075)
Leverage	0.228	0.301	0.873	0.401	0.355	-0.611	0.403	0.333	-0.209	-0.531	0.891	-0.397
	(0.148)	(0.127)	(0.176)	(0.273)	(0.151)	(0.100)	(0.175)	(0.211)	(0.187)	(0.141)	(0.100)	(0.182)
Growth	0.451*	0.822**	0.345*	0.841***	0.322*	0.304***	0.366***	0.861**	0.232**	0.332*	0.362*	-0.215*
	(0.064)	(0.012)	(0.078)	(0.000)	(0.089)	(0.000)	(0.001)	(0.032)	(0.011)	(0.076)	(0.089)	(0.051)
Firm Size	0.313	0.271	0.311	0.287	0.274	0.296	0.377	0.391	0.375	0.281	0.305	0.295
	(0.154)	(0.210)	(0.162)	(0.144)	(0.132)	(0.123)	(0.172)	(0.105)	(0.118)	(0.221)	(0.198)	(0.133)
Firm Age	-0.322***	-0.352*	-0.201	-0.401**	-0.388***	-0.415*	-0.398**	-0.362*	-0.233	-0.328	-0.252***	-0.372*
	(0.000)	(0.010)	(0.165)	(0.022)	(0.000)	(0.098)	(0.022)	(0.076)	(0.221)	(0.211)	(0.000)	(0.0
OCF	0.851**	0.256*	0.365**	0.291***	0.213**	0.289***	0.301***	0.237*	0.275*	0.431	0.215	0.456**
	(0.021)	(0.051)	(0.021)	(0.000)	(0.012)	(0.000)	(0.000)	(0.072)	(0.055)	(0.219)	(0.173)	(0.037)
REM (t-1)	0.882*	0.823*	0.852***	0.801***	0.891***	0.895**	0.822*	0.872***	0.821*	0.831*	0.823**	0.830**
	(0.071)	(0.082)	(0.000)	(0.000)	(0.001)	(0.065)	(0.063)	(0.001)	(0.065)	(0.041)	(0.041)	(0.044)
Observations	560	560	560	530	530	530	604	604	604	736	736	736
AR (1) (p-value)	0.024	0.000	0.214	0.013	0.025	0.004	0.021	0.003	0.001	0.012	0.014	0.002
AR (2) (p-value)	0.303	0.405	0.525	0.605	0.232	0.321	0.415	0.231	0.670	0.721	0.715	0.671
Hansen test	0.385	0.175	0.654	0.494	0.533	0.652	0.442	0.212	0.881	0.664	0.321	0.525
Difference in Hansen test	0.431	0.305	0.197	0.185	0.381	0.402	0.541	0.208	0.561	0.415	0.511	0.884

Notes: Table 7 estimate the moderating effect of INEDs Education and Tenure on regulations-2012 (Singapore). Arellano and Bond (1991), first-order autocorrelation AR (1), second-order autocorrelation AR (2) and the Hansen test of over-identifying restrictions to examine the validity and strength of instruments used in the level equation. Estimated p-values are in parentheses. *, **, and *** represent significance at 10%; 5% and 1% level respectively.

Table 8. Moderating effect of INEDs Education and Tenure on regulations-2012 (Vietnam)

	Mandatory adopters						Voluntary adopters					
Dependent Variable: EM	Family			Non-Family			Family			Non-Family		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Regulations-2012	-0.481	-0.284	-0.305	-0.471	-0.451	-0.452	-0.421	-0.386	-0.307	-0.375*	-0.264**	-0.375***
	(0.243)	(0.187)	(0.143)	(0.223)	(0.123)	(0.293)	(0.243)	(0.184)	(0.146)	(0.081)	(0.012)	(0.000)
INEDs	-0.325	-0.371	0.305	-0.406	-0.405	-0.345	-0.324	-0.371	0.305	-0.202***	-0.320	-0.471**
	(0.161)	(0.159)	(0.201)	(0.121)	(0.124)	(0.274)	(0.164)	(0.160)	(0.202)	(0.000)	(0.211)	(0.031)
Herfindahl Index Education	-0.425	-0.266	-0.376	-0.421	-0.496	-0.233	-0.421	-0.265	-0.376	-0.301***	-0.391**	-0.397*
	(0.130)	(0.257)	(0.279)	(0.201)	(0.183)	(0.122)	(0.132)	(0.253)	(0.279)	(0.001)	(0.026)	(0.082)
Herfindahl Index Tenure	-0.285	-0.293	-0.287	-0.377	-0.414	-0.426	-0.288	-0.296	-0.287	-0.331*	-0.231***	-0.215*
	(0.161)	(0.136)	(0.156)	(0.171)	(0.210)	(0.203)	(0.163)	(0.135)	(0.156)	(0.053)	(0.000)	(0.051)
INEDs' Education	0.271	-0.366	-0.418	-0.256	-0.883	-0.375	0.291	-0.366	-0.418	-0.404***	-0.465*	- 0.413**
	(0.134)	(0.201)	(0.281)	(0.121)	(0.176)	(0.212)	(0.133)	(0.203)	(0.281)	(0.000)	(0.057)	(0.033)
INEDs' Tenure	0.845	-0.391	-0.252	-0.402	-0.149	-0.377	0.841	-0.399	-0.251	-0.288**	-0.423*	- 0.201**
	(0.163)	(0.188)	(0.266)	(0.107)	(0.265)	(0.192)	(0.163)	(0.189)	(0.265)	(0.049)	(0.097)	(0.022)
Regulations-2012* INEDs' Education	-0.491		-0.304	-0.289		-0.275	-0.497		-0.304	-0.287**		-0.273**
	(0.188)		(0.214)	(0.098)		(0.161)	(0.188)		(0.213)	(0.098)		(0.022)
Regulations-2012* INEDs' Tenure		0.351	0.375		0.384	0.482		-0.471	-0.471		-0.354**	-0.386*
		(0.176)	(0.293)		(0.142)	(0.141)		(0.421)	(0.441)		(0.014)	(0.091)
Board Size	-0.366*	-0.405*	-0.814*	-0.371**	-0.385	-0351*	-0.251*	-0.216*	-0.284***	0.205	0.324*	-0.811*
	(0.096)	(0.092)	(0.045)	(0.041)	(0.228)	(0.042)	(0.065)	(0.062)	(0.000)	(0.165)	(0.086)	(0.052)
CEO Duality	-0.396	-0.421	-0.241	-0.399	-0.334	-0.387	-0.308	-0.403	-0.218	-0.332	-0.432	-0.411
	(0.141)	(0.101)	(0.211)	(0.145)	(0.209)	(0.175)	(0.211)	(0.172)	(0.153)	(0.113)	(0.143)	(0.133)
BIG 4	-0.352**	-0.381**	- 0.301***	-0.331*	-0.286	-0.431*	-0.382**	-0.271**	-0.201***	-0.306	-0.855*	-0.205**
	(0.041)	(0.041)	(0.001)	(0.071)	(0.181)	(0.091)	(0.041)	(0.041)	(0.000)	(0.161)	(0.06`)	(0.02`)
Leverage	-0.381	-0.372*	- 0.491	-0.364	-0.382	-0.321	-0.282	-0.332	-0.416	-0.402	-0.401	-0.209
	(0.182)	(0.171)	(0.121)	(0.222)	(0.324)	(0.221)	(0.161)	(0.187)	(0.151)	(0.121)	(0.322)	(0.201)
Growth	0.864*	0.875*	0.863*	0.853*	0.839*	0.546	0.221**	-0.245*	0.822***	0.221**	0.493*	0.487**
	(0.081)	(0.091)	(0.089)	(0.072)	(0.081)	(0.212)	(0.041)	(0.075)	(0.000)	(0.042)	(0.086)	(0.042)
Firm Size	0.264	0.297	0.363	0.305	0.276	0.261	0.274	0.251	0.261	0.308	0.361	0.312
	(0.173)	(0.181)	(0.193)	(0.174)	(0.122)	(0.196)	(0.123)	(0.203)	(0.122)	(0.211)	(0.151)	(0.169)
Firm Age	-0.352*	-0.422**	-0.251	-0.322	-0.372***	-0.410*	-0.289***	-0.322**	-0.361*	-0.377**	-0.212	-0.381**
	(0.072)	(0.011)	(0.111)	(0.211)	(0.000)	(0.099)	(0.000)	(0.022)	(0.093)	(0.011)	(0.121)	(0.022)
OCF	0.381**	0.231**	0.302	0.388	0.281*	0.274*	0.457*	0.383*	0.332**	0.452*	0.414***	0.814*
	(0.012)	(0.041)	(0.201)	(0.129)	(0.063)	(0.061)	(0.065)	(0.031)	(0.042)	(0.066)	(0.001)	(0.066)
REM (t-1)	0.823**	0.806	0.831*	0.881***	0.890	0.887***	0.851**	0.871***	0.891*	0.852**	0.881*	0.882*
	(0.021)	(0.431)	(0.051)	(0.000)	(0.132)	(0.000)	(0.021)	(0.001)	(0.098)	(0.021)	(0.076)	(0.075)
Observations	985	985	985	580	580	580	435	435	435	715	715	715
AR (1) (p-value)	0.001	0.031	0.002	0.001	0.033	0.076	0.021	0.001	0.041	0.011	0.012	0.003
AR (2) (p-value)	0.502	0.821	0.423	0.452	0.306	0.461	0.631	0.614	0.421	0.721	0.501	0.591
Hansen test	0.430	0.722	0.634	0.451	0.494	0.599	0.371	0.391	0.216	0.663	0.421	0.601
Difference in Hansen test	0.285	0.341	0.501	0.423	0.624	0.571	0.531	0.390	0.284	0.413	0.524	0.484

Notes: Table 8 estimates the moderating effect of INEDs Education and Tenure on regulations-2012 (Vietnam). Arellano and Bond (1991), first-order autocorrelation AR (1), second-order autocorrelation AR (2) and the Hansen test of over-identifying restrictions to examine the validity and strength of instruments used in the level equation. Estimated p-values are in parentheses. *, **, and *** represent significance at 10%; 5% and 1% level respectively.

Table 9. Robustness test: Propensity score matching (PSM)

Panel A: Mean test across founder family firms and non-family firms	Singapore			Vietnam		
	Treated	Control	t-stats	Treated	Control	t-stats
Board size	2.15	2.22	0.761	2.11	2.55	0.87
CEO Duality	9.11	9.08	0.133	7.27	7.27	0.22
BIG 4	2.37	2.21	0.381	2.33	2.21	0.38
Leverage	33.3	35.1	0.298	29.1	32.2	0.29
Growth	3.18	3.91	0.330	8.31	7.36	1.67
Firm Size	3.88	3.51	0.271	5.32	4.33	0.33
Firm Age	2.96	3.05	0.252	4.92	4.11	0.14
OCF	2.91	3.98	5.02	4.98	8.15	2,11
REM	1.15	1.33	0.111	1.27	1.14	1.18

Panel B: Propensity store matching variables	Singapore			Vietnam		
	Pooled Fixed effects	Pooled Fixed effects	PSM	Pooled Fixed effects	Pooled Fixed effects	PSM
	(1)	(2)	(3)	(4)	(5)	(6)
Regulations-2012	-0.299*	-0.245*	- 0.205*	- 0.411**	-0.261***	- 0.382***
	(0.099)	(0.075)	(0.065)	(0.033)	(0.000)	(0.000)
Founder Family	-0.219	-0.386	-0.332	-0.201	0.243	0.205
	(0.161)	(0.138)	(0.213)	(0.122)	(0.118)	(0.123)
Family Founder * Regulations-2012	-0.403	-0.473	-0.301	-0.202	- 0.302	-0.311
	(0.172)	(0.01)	(0.161)	(0.102)	(0.201)	(0.199)
Non-Family	-0.275**	-0.412**		- 0.487**	-0.133*	
	(0.042)	(0.024)		(0.042)	(0.082)	
Non-Family * Regulations-2012	-0.339*	0.403**		- 0.814*	-0.421***	
	(0.088)	(0.022)		(0.069)	(0.001)	
Board Size		-0.205*	- 0.372**		-0.378*	- 0.382*
		(0.091)	(0.048)		(0.072)	(0.079)
CEO Duality		-0.223	-0.287		-0.257	- 0.338
		(0.201)	(0.203)		(0.210)	(0.178)
BIG 4		-0.350**	- 0.229**		-0.401*	0.311*
		(0.033)	(0.049)		(0.099)	(0.072)
Leverage		0.401	0.457		-0.252	0.302
		(0.173)	(0.265)		(0.266)	(0.228)
Growth		0.844***	0.857**		-0.308*	-0.825**
		(0.000)	(0.023)		(0.091)	(0.011)
Firm Size		0.302	0.299		0.288	0.276
		(0.126)	(0.129)		(0.159)	(0.144)
Firm Age		-0.377**	-0.398*		0.266	0.332
		(0.033)	(0.098)		(0.191)	(0.122)
OCF		0.321***	0.228*		0.291*	0.410**
		(0.000)	(0.088)		(0.093)	(0.021)
REM		0.222**	0.321*		0.366*	0.392*
		(0.041)	(0.088)		(0.076)	(0.089)
Constant	0.278***	0.299***	0.308*	0.289***	0.201***	0.219*
	(0.000)	(0.001)	(0.099)	(0.000)	(0.001)	(0.091)

Industry dummy	Yes	Yes	Yes	Yes	Yes	Yes
R-sq	0.55	0.51	0.53	0.47	0.56	0.52

Notes: Panel A of Table 9 presents the univariate analysis of the difference in means test between founder family firms and non-family firms for the variables used in the PSM. Panel B presents the difference in firm performance between founder firms and a sample of propensity-score-matched nonfamily firms. ***$p < 0.01$; **$p < 0.05$; *$p < 0.10$; two-tailed tests.

Authors Statement

All authors certify that they have participated sufficiently in the work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript.

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