Corporate governance and earnings management: Evidence from Vietnamese listed firms

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A B S T R A C T

Using the hand-collected data of 800 Vietnamese non-financial firms from 2008 to 2018, this study constructs a comprehensive corporate governance index in alignment with the corporate governance code of best practices in Vietnam. We provide strong evidence that corporate governance quality restrains earnings management, measured by both the absolute and signed discretionary accruals and the real earnings management. In particular, the negative association between corporate governance quality and earnings management is more profound in private firms (non-SOEs), firms with high foreign ownership and low concentrated ownership, and high growth firms compared to their peers. The observed results are robust to alternative measures of discretionary accruals, total accruals andreal earnings management. Furthermore, the results are corroborated using instrumental variables, firm fixed effects and propensity score matching methods to address potential reverse causality and sample selection bias.

1. Introduction

Earnings management has begun to attract public attention in the wake of recent corporate scandals in Vietnam. Vien Dong Pharmaceutical Joint Stock Company (DVD), one of the most lucrative-looking companies in the pharmaceutical industry, suddenly faced bankruptcy in 2011, even though the firm's earnings growth rate was reported to be 325 percent in 2009, when DVD ranked the first in the industry. Inefficient corporate governance practices, such as the excessive concentration of power in the hands of top leaders, an inefficient board structure with conflicts of interest, and an ornamental supervisory board were blamed for assisting DVD management in defrauding its stakeholders. Similarly, other companies, such as Hoang Anh Gia Lai Group JSC (HAG) and Ho Chi Minh Infrastructure Investment JSC (CII), inflated their earnings to attract investors. On the other hand, other firms such as Quoc Cuong Gia Lai JSC (QCG) and Nafoods Group JSC (NAF), were revealed to have manipulated their earnings downward (Tap Chi Tai Chinh, 2020). These scandals motivate this study to explore the role of corporate governance quality as a significant driver of earnings management in Vietnam.

Globally, the infamous scandals involving Enron, Worldcom, Olympus, Parmalat, and Toshiba, to name but a few, have thrown up numerous questions about the efficiency of management accounting, auditing, and corporate governance practices. Di Miceli da Silveira (2013) reveals that Enron's internal governance failures lead to managers' taking advantage of accounting loopholes to manipulate its earnings and conceal its heavy losses. Chen et al. (2007) emphasise a pivotal role of corporate governance in stimulating

transparency and efficiency, protecting minority shareholders' wealth, ensuring the fair treatment of all shareholders, and facilitating the timely and accurate disclosure of all material matters. Deficient corporate governance mechanisms may result in severe agency costs and information asymmetry (Bhojraj & Sengupta, 2003) as well, which can be attributed to managerial misbehaviour. García-Meca and Sánchez-Ballesta (2009) propose that corporate governance helps to align the interest of managers with those of shareholders and to enhance the credibility of accounting information. It is notable that, Bao and Lewellyn (2017) and Lel (2019), in their recent multi-country studies, find that firms in emerging markets manipulate earnings to a much higher level, as their legal enforcement is less strict compared to developed markets.

In Vietnam, civil litigation is rare because of restrictions in civil law and the absence of punishment spectrum in contemporary securities law and other regulations. Moreover, the distinctive institutional setting in Vietnam, such as its unique administrative governance approach which relies on accounting information to govern listed firms, the prevalence of listed companies who are former state-owned enterprises, and the dominance of concentrated ownership further encourage highly aggressive and inappropriate earnings management. Prior evidence from other countries; therefore, may not be applicable to the Vietnamese market. Thus, a natural question to examine, but relatively under-researched in the Vietnamese context, would be: does better corporate governance quality reduce earnings management?

We delve into this question in the context of the Vietnamese market for the following reasons. Prior research has documented the role of different corporate governance attributes in limiting earnings management activities; however, it has been conducted mostly in developed economies, and the empirical findings remain inconclusive. For instance, Arun et al. (2015) investigate UK listed firms and conclude that independent female directors disincentivise earnings manipulation. In the same vein, Davidson et al. (2005) find that Australian listed firms with a majority of non-executive directors on the board and the audit committee can restrain earnings management, while the choice of auditor and the formation of an internal audit function do not affect the level of discretionary accruals. On the other hand, Park and Shin (2004) find no supporting evidence that ordinary outside directors play a significant role in supervising managerial earnings management activities in Canada. Overall, these studies single out specific attributes of the governance structure; thus, potentially overlook the effect of composite corporate governance quality on the earnings management. By establishing the composite governance index measurable, this study extends the literature that explores the determinants of earnings manipulation in the Vietnamese context.

Additionally, to the best knowledge of authors, there is only one study, Essa et al. (2016) examining the association between corporate governance and earnings management in Vietnam, whose findings are subject to methodological limitation. Only one governance attribute, i.e. the board size, has been used in the study which may not provide a comprehensive measure of a firm's governance structure. Furthermore, sample selection bias and unaddressed endogeneity issues may result in potentially biased estimates (Ali et al., 2018; Wintoki et al., 2012). Given the inconsistent findings in the literature, the absence of prior research in the Vietnamese market, and the unique institutional setting of Vietnam, this study is motivated to examine whether and to what extent the earnings manipulation can be disciplined by corporate governance mechanisms. This study may provide new insights into the earnings management practices in an emerging market economy, compared to other developed economies.

This study examines the impact of corporate governance on earnings management measured by the absolute value of discretionary accruals, using the sample of 800 non-financial firms (5434 firm-year observations) listed on either the Ho Chi Minh Stock Exchange (HOSE) or the Hanoi Stock Exchange (HNX) from 2008 to 2018. This study employs 13 characteristics of governance structure, taking into account key principles of Corporate Governance Codes to establish a corporate governance index measurable in Vietnam. This proxy measure provides an overarching governance structure of a firm; thus, serves as a benchmark of firms' corporate governance quality. We find statistically and economically significant relationship, suggesting that better-governed firms experience a lower level of earnings management. In particular, we find that an increase in the corporate governance quality-index by one standard deviation decreases the standard deviation of the absolute value of discretionary accruals by 5.10 percent.

The results are robust to endogeneity testing, and to alternative measures of earnings management. In particular, to mitigate the unobserved heterogeneity, the random effects model is employed. The changes in discretionary accruals when corporate governance quality changes are then examined and two-stage least squares method (2SLS) is employed to deal with simultaneity. Finally, the propensity score matching (PSM) is used to eliminate the sample selection bias. The results are consistent across alternative model specifications and unaffected by the endogeneity bias.

The role of institutional characteristics of Vietnamese firms (such as ownership structure and growth opportunities) is also investigated to further analyse the dynamics of the institutional settings. Corporate governance quality is found to have significant negative effect on earnings management in private firms (non-SOEs), firms with high foreign ownership and low concentrated ownership. We also find that lower earnings management driven by better corporate governance may be partially attributed to firms' growth opportunities. The significant effect of corporate governance on earnings manipulation is only experienced in high growth firms.

The contribution of this study is twofold. First, although there are several studies that explore the relationship between corporate governance and earnings management by composing the governance index encompassing multiple dimensions of governance attributes, their findings are difficult to be generalised and yet limited due to the following reasons including: 1) the use of relatively short sample periods of one to four years (Al-Rahahleh, 2016; Bekiris & Doukakis, 2011; Shen & Chih, 2007), 2) the industry-specific and country-specific evidence whose institutions are vastly different from Asian emerging markets (Al-Rahahleh, 2016; Bekiris & Doukakis, 2011) and 3) the use of accruals-based method that may reflect the incomplete/limited measure of earnings management. In this study, we cover a large time-series data from 2008 to 2018 across all firms in Vietnam allowing us to generalise the results to wider economy. Besides, the use of real earnings management, in addition to the two alternative accruals-based methods to measure earnings management, i.e. the modified Jones model (1991) and performance-matched discretionary accruals model of Kothari et al. (2005),

provides more reliable estimation of corporates' earning quality and supports our findings to be robust and current.

Second, this is the first study to construct the composite governance index (CGI) tailored to the institutional structures in Vietnam and find its significant negative association with earnings management. The Vietnamese market is chosen for the focus of this research, as it presents unique settings characterised by State Securities Commission of Vietnam (SSC) regulators' heavy dependence on firms' financial reporting on their decision making, highly concentrated ownership, intensive government intervention and ownership, and a low level of investor protection. By constructing a new CGI aligned to the quantifiable requirements of the corporate governance code of best practices in Vietnam to evaluate the level of compliance with the corporate governance regulations, it sheds light on the exchanges' and SSC's assertion that better corporate governance practices can curb earnings management and increase accounting information quality presented by insiders to outsiders. Given a scant number of literature on the nexus between corporate governance and earnings management in Vietnam, this study enriches the prior corporate governance literature in Vietnam, whose findings have been mainly focused on firm performance (Nguyen et al., 2017; Vo & Nguyen, 2014). Besides, the developed governance index in this study can be also applied to or extended to other emerging markets that exhibit similar corporate governance mechanisms.

The remainder of the paper is structured as follows. Section 2 presents the background and hypotheses development. Section 3 describes the data and research methodology. Section 4 discusses the empirical results and Section 5 provides concluding remarks.

2. Background and hypotheses development

2.1. Corporate governance law and regulations upon the Vietnamese listed firms

Vietnam recently becomes one of the world's most rapidly growing countries, with an annual average GDP growth rate of 6.1 percent from 2008 to 2018 (World Bank, 2019). Despite the rapid growth rate, the Vietnamese capital market is still in its infancy. Ho Chi Minh Stock Exchange (HOSE), the largest stock exchange in Vietnam, was officially put into operation in 2000, while the Hanoi Stock Exchange was formally launched in 2005. The SSC is the principal regulatory body of the Vietnamese stock market.

In Vietnam, Corporate Governance Codes (CGC) provide the most comprehensive guidance on corporate governance of listed companies. In particular, the first regulation on the Corporate Governance Codes, the so-called Decision[1] No. 12/2007/QD-BTC, dated 13 March 2007, was first promulgated by the Minister of Finance soon after the Ho Chi Minh Stock Exchange was launched. This Decision applied to companies listed on the stock exchange or a securities-trading centre. Then, Circular No. 121/2012/TT-BTC, dated 26 July 2012, and Decree No. 71/2017/ND-CP, dated 22 September 2017, were issued on corporate governance of public unlisted and listed companies. In general, the Corporate Governance Codes impose rules on: shareholders' right and general meeting of shareholders; board of directors and members of the board of directors; supervisory board and members of the supervisory board; conflict of interest prevention; reporting and disclosure of information; corporate governance application in large-scale public unlisted and listed companies; and supervision and violation handling regimes.

Even though the CGC was envisioned to introduce the most suitable corporate governance practices in line with the Vietnamese institutional setting, Le and Walker (2008) reveal the lack of compliance with corporate governance among listed firms in the country. This is mainly due to the weak law enforcement and the absence of punishment regime in contemporary securities law and regulations (Hoang et al., 2016a; Kabir & Thai, 2017). Furthermore, many listed companies are former SOEs in which the state still holds the controlling interest and appoint one or more representatives on the board to supervise firms' business affairs (Tran & Holloway, 2014). Additionally, many Vietnamese firms are owned by a few shareholders who are likely to assign their immediate family members to the board of directors and the key management positions. The government intervention and the dominance of concentrated ownership in Vietnam has led to the lack of proper supervision and a higher probability of expropriation of minority shareholders.

2.2. Earnings management in Vietnam

Earnings management is defined as a false statement of the actual performance of a business by its insiders (Klein, 2002). This occurs when managers misuse their judgment to manipulate the transactions in financial reports to either misinform stakeholders about the underlying firm performance or control contractual outcomes that are determined by the reported information (Healy & Wahlen, 1999). Earnings manipulation has been pervasive in Vietnam due to its unique institutional setting. First, the sole reliance of SSC regulators on the firms' accounting information when administering the listing rules and M&A rules instigate earnings management. For example, a firm listed on HOSE or HNX has to obtain a positive return on equity (ROE) to issue additional shares to existing shareholders, and the ROE of the merged firm needs to be positive or higher than the acquiring firm's ROE for five consecutive years for the M&A execution. Also, firms are to be delisted if they have reported losses in three straight years, or accumulated losses exceed the charter capital in the latest audited financial statement before the time of consideration.

Second, the earnings management activities are attributed to the dominance of concentrated ownership in Vietnam. Given the lack of proper supervision and prevalent expropriation of minority shareholders, controlling shareholders are tempted to distort the actual value of the firms for their own interests, such as gains from stock sales, empire-building, and delisting avoidance. Due to weak law

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[1] In Vietnam, the major types of legal documents are laws, decrees, and circulars and decisions. Laws are drafted by the relevant Ministry and approved by the National Assembly after being first approved by the Government. Decrees are passed by the Government, establishing detailed rules beneath a Law, and Circulars and Decisions are issued by the Ministry responsible for drafting the relevant Law and Decree, offering policy guidance for how the Law and Decree will be applied.

enforcement, the absence of punishment schemes in securities law and regulation, and the lack of minority shareholder protection schemes (Hoang et al., 2016a; Kabir & Thai, 2017), minority shareholders rarely challenge to file for a lawsuit against controlling shareholders on critical issues, which eventually exacerbates the high level of earnings management in Vietnam.

2.3. Corporate governance and earnings management

The role of corporate governance is to mitigate the agency problem and reduce agency costs to maximise the wealth of shareholders (Shleifer & Vishny, 1997). Prior studies find that companies with good corporate governance have better performance (Duchin et al., 2010; Larcker et al., 2007), higher stock liquidity (Ali et al., 2017) and a lower probability of default risk (Bhojraj & Sengupta, 2003). Specifically, strong corporate governance mitigates information asymmetry between insiders (e.g., managers) and outsiders (e.g., investors), as well as among outsiders; thus, enhance corporate information transparency (Leuz et al., 2003). Because managers tend to have private information and firm-specific experience in all aspects of firms' businesses, severe moral hazard problems can arise out of the information asymmetry between insiders and outsiders. Badolato et al. (2014), Davidson et al. (2005) and Klein (2002) have documented the benefits of internal governance mechanisms, such as audit committee and board of director characteristics in lowering agency costs and information asymmetries, which results in limiting the opportunity to distort earnings.

The corporate governance proxy in this study covers two dimensions of corporate governance, namely, board of directors and supervisory board,[2] which comprise 13 governance attributes. The attributes stem from the Corporate Governance Codes and constitute a corporate governance index (CGI) for the Vietnamese firms. While the well-known Gompers et al. (2003) governance index measures firms' anti-takeover mechanism, the governance index in this study underlines internal governance mechanism.

Since the market for corporate control is immature in Vietnam, this study does not consider the threat of takeover as a corporate governance mechanism. The index in this study is rather closer to Brown and Caylor (2004) and the Horwath/University of Newcastle corporate governance report (2002). However, due to the differences among the institutional settings of the US, Australia, and Vietnam as well as the data availability issues, the index has to disregard some aspects, such as progressive practices, and include other features that are more relevant to the Vietnamese context, such as the supervisory board. The following section reviews each corporate governance attribute and demonstrates how it influences monitoring and advising functions of the board.

2.3.1. Board of directors

CEO duality is one of the key features of board structure, which has attracted much attention from regulators and researchers. In Vietnam, Corporate Governance Codes prevent the chairperson from serving as a CEO simultaneously unless it is approved by the annual general meeting of shareholders (see article 10 of Decision 12 and Circular 21). Agency theorists indicate that a unified leadership results in a more powerful CEO/chairperson, which may impair the board's effectiveness in monitoring managerial opportunism (Eisenhardt, 1989; Jensen, 1993), potentially leading to an escalation of agency costs and entrenchment risks (Fama & Jensen, 1983). Consistent with this argument, prior research indicates that firms committing fraud tend to have CEOs who also serve as the chairman (Chen et al., 2006). In the same vein, Lo et al. (2010) examine 266 companies listed on the Shanghai Stock Exchange and find that CEO duality leads to more opportunistic behaviour by managers, in particular, transfer pricing manipulation. Therefore, the CEO duality indicator is set equal to one, zero otherwise.

Another major aspect of the board of directors is board independence. Decision 12 and Circular 121, Article 11 and Decree 71, Article 13 require approximately one-third of directors on the board to be non-executive directors and also suggest that members of the board of directors should not be executives, so that board independence is maintained. Agency theorists and resource dependence theorists point out that outside directors are an essential internal governance mechanism to ensure the effectiveness of the board by supervising managers' self-interested behaviour and restraining managerial opportunism (Jensen & Meckling, 1976). Outside directors are more likely to be effective than inside directors in preventing managers from self-interested behaviors and actions (Jensen & Meckling, 1976) because they are more inclined to monitor firms very diligently. To protect their reputation, they strive to constrain or report managerial opportunism (Fama, 1980; Fama & Jensen, 1983). Moreover, they can provide essential resources and expertise to enhance firm performance (Hillman et al., 2000). Coffey and Wang (1998) suggest that non-executive directors, who do not manage the day-to-day activities of firms and have less financial interest in them, may offer more objective suggestions. Davidson et al. (2005) and Klein (2002); Lo et al. (2010) provide evidence that a board that is more independent of the management team is less likely to manipulate earnings. In this study, non-executive directors' indicator is set to one if the majority of the board members are non-executive directors, zero otherwise. Non-executive chairperson's indicator is equal to one if the chairperson is not in the top management team, zero otherwise.

Board size, an essential attribute of the board structure, has drawn much attention from regulators. In Vietnam, under Decision 12, the board of directors must have five to eleven members (see Article 11). Agency theorists suggest that smaller boards are more efficient because they are less likely to encounter coordination and communication problems. Directors on a small board tend to be more involved and more efficient in their decision-making, and so more effective in monitoring the management team (Daily & Dalton, 1994; Jensen, 1993). Chen (2014) argues that timely and correct decisions are more critical for firms' survival when there are sudden changes in the business setting. Unlike this, resource dependence theorists support the notion of a larger board size, as Hillman et al. (2009) find that they bring more resources to the firm, although Switzer and Wang (2013) claim it is harder for managers to control a

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[2] In Vietnam, the functions of the supervisory board are similar to, but broader compared to, the audit committee.

relatively large board. Previous research on the relationship between board size and earnings management provides inconsistent findings. While some studies demonstrate a negative association (Peasnell et al., 2005; Rahman & Ali, 2006), in contrast, Sáenz González and García-Meca (2014) provide evidence that smaller board size is associated with a lower level of earnings management. Meanwhile, Bao and Lewellyn (2017) and Katmon and Farooque (2017) find that board size has no significant impact on earnings management. Chen et al. (2007), while building their corporate governance index, suggest that a firm is well governed when its board of directors is larger than the minimum legal requirement and smaller than two standard deviations from the mean value of the board size. Following Chen et al. (2007), the board size indicator is equal to one if it is well governed, zero otherwise.

The diversity of the board of directors has been documented to have significant impacts on firm outcomes (Hoang et al., 2016a; Hoang et al., 2016b). Decree 71 promotes board diversity and requires that a balanced contribution must be made among board members in having knowledge and experience in law, finance, and business operations of the company, and gender in their structure (see Article 13). From the fiduciary perspective, board diversity can be effective in establishing better monitoring and controlling mechanisms, as underpinned by the agency theory (Jensen & Meckling, 1976). Meanwhile, from the advisory perspective, firms depend on board members' diversity for resources, including expertise, advice, reputation and communication networks to enhance firm performance and the survival, as supported by resource dependence theory (Hillman et al., 2000). The gender-diverse board has been documented as able to allocate more effort to monitoring (Adams & Ferreira, 2009), resulting in higher stock liquidity (Ahmed & Ali, 2017) and better earnings quality (Hoang et al., 2016b). The extant literature has shown positive effects of female directors on firm performance in China (Liu et al., 2014), in Asian firms (Low et al., 2015), and in Vietnam (Nguyen et al., 2015). Arun et al. (2015) examine the relationship between female directors and earnings management in the UK and find that a high number of females is associated with less earnings manipulation, especially in simple (low debt) firms. Thus, the gender diversity indicator is equal to one if there is at least one female on the board of directors, zero otherwise.

Heijltjes et al. (2003) encourage diversity in terms of the nationality of top management teams in small countries that are growing their economies internationally. This is based on the contention that foreign directors have a better understanding of the international business environment; they can enhance the decisions made by the board. Furthermore, they facilitate firms' access to global resources and now how to ensure favourable business prospects. Milliken and Martins (1996) find that the impact of national diversity on performance is positive in the long-term. The national diversity indicator is set to one if there is at least one foreign director on the board, zero otherwise.

Agrawal and Nasser (2018, 2019) document that the presence of blockholder directors[3] on the board leads to better contracting and monitoring over managers, lower risk, and higher firm value. Retaining the monitoring power as a director and keeping the ownership interest as a blockholder helps to align the interest of managers with that of shareholders. The blockholder director indicator is equal to one if there is at least one blockholder on the board, zero otherwise.

Prior studies find that a high level of education and experience among directors contributes to the success of the board in terms of adopting new ideas and accepting innovations, and offering a broader view and solutions to complex problems (Milliken & Martins, 1996; Wally & Baum, 1994), thus increasing earnings quality (Lo et al., 2010). Park and Shin (2004) examine earnings management practices in Canada and report the importance of directors having accounting or financial backgrounds in deterring earnings manipulation. The board education and board experience indicators are equal to one if the majority of the board members have a postgraduate degree and if there is at least one director having finance and accounting experience on the board, respectively, zero otherwise.

The extant literature suggests that top official with little experience may not have an adequate understanding of the firm, while the longer the tenure of the chairman, the better the understanding of the firm, its rivals and industry. Therefore, they are more able to deter fraudulent activities and reduce the incidence of earnings manipulation (Chen et al., 2006; Cornett et al., 2008). The chairman tenure indicator is equal to one for firms with chairperson tenure higher than the sample's mean value, zero otherwise.

2.3.2. Supervisory board

Vietnam has a hybrid corporate governance system where firms have a supervisory board (SB),[4] which is independent of the board of directors and is meant to supervise the board of directors and executives. According to Corporate Governance Codes, the SB does the following: recommend the general assembly of shareholders to approve for the independent external auditors to audit the financial statements of the company; take responsibility towards shareholders for monitoring activities; oversee the financial status of the company, legitimacy of the activities of the board of directors and the top management team; and coordinate between the supervisory board and board of directors, CEO, and shareholders. A supervisory board is required to have three to five members and they must not work in the firm's accounting and finance departments. They should not be a member or employee of the independent auditing firm that audited the company's financial statements over the last three years. Chen et al. (2006) document the positive influence of the presence of the supervisory board on the firm's performance. Davidson et al. (2005) study Australian listed firms and find that the presence of an audit committee in a firm can constrain earnings management. Al-Rassas Ahmed and Kamardin (2016) and Badolato et al. (2014) reveal that the independence and financial expertise of the audit committee are related to higher earnings quality.

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[3] Blockholders are investors who own five percent or more of the outstanding equity.

[4] In Vietnam, Law on Enterprises 2005 mandates that a shareholding company with either more than 11 shareholders or one (or more) institutional investor(s) holding more than 50 percent of the equity capital must establish a separate SB elected by the general meetings of shareholders, which is independent from the board of directors (BoD) and executives. The SB supervises the BoD and the CEO in the best interests of the shareholders. There is no hierarchy between the BoD and SB.

Similarly, it is expected that the supervisory board plays an essential role in overseeing the board of directors and CEO and proposing measures to improve the management of the company, resulting in reducing incidents of earnings manipulation. The supervisory board size indicator is set to one for firms with a supervisory board size larger than the legal requirement (three members). The supervisory board independence is equal to one if all supervisors are non-executives of the company, zero otherwise.

Corporate Governance Codes require supervisors who work in listed firms with over 50 percent of charter capital held by the state must be auditors or accountants. The head of the supervisory board must be a professional auditor or accountant working full-time at the company. This will ensure that supervisors are equipped with relevant expertise to oversee the company's financial situation. The supervisor experience indicator equal to one if at least one supervisor has finance and accounting experience, zero otherwise. In summary, the construction of CGI including 13 attributes under the category of board composition and board diversity is recapitulated in Table 1.

2.3.3. Corporate governance index constitution

The corporate governance index (CGI) is the key independent variable in this study and is constructed to measure the corporate governance quality of each firm in Vietnam. Prior studies have constructed the corporate governance index including two US-based measures - Gompers et al. (2003) and Brown and Caylor (2004), Australia-based Horwath/University of Newcastle corporate governance report (2002), Taiwan-based Chen et al. (2007), and Japan-based Aman and Nguyen (2008). Each of the indexes is constructed based on the nation's idiosyncratic institution of governance, and thus the index composition is yet subjective. This study finds it challenging to replicate each index due to the absence of information/instruction provided in their studies as well as the lack of data availability. Often is the case that model specification is missing to assign the value for each attribute, and the selection criteria are omitted in the prior studies. Therefore, this study addresses the issues by following the guidance of Corporate Governance Codes to identify which attribute is related to good corporate governance practices in the Vietnamese market. Based on the above-mentioned 13 attributes, a corporate governance index (CGI) has been established as a proxy of its quality. In the absence of the standard rule of weighting in constructing the CGI, an equally weighted scoring method that has been used in existing corporate governance literature (Ali et al., 2018; Aman & Nguyen, 2008; Gompers et al., 2003) is applied. Each of these 13 attributes has binary values as described in the previous section. The values are aggregated to construct a composite corporate governance index ranging from zero to 13. In order to avoid biasing the index downward, this study follows Aman and Nguyen (2008) and normalises the corporate governance index linearly between zero and 100 percent. For instance, if the aggregated value of the index is seven, the normalised index will be 53.85 percent (seven out of thirteen). However, if there was one missing value in the corporate governance index, the normalised index will be 58.33 percent (seven out of twelve). The higher the index, the better the firm is expected to be governed. This study argues that better corporate governance enhances monitoring and advising functions of the board of directors, which in turn reduce agency costs and information asymmetry, resulting in a lower level of earnings management. The hypothesis is as follows:

H1. Corporate governance quality, as proxied by the corporate governance index, has a negative relationship with earnings management.

3. Data and research method

3.1. Data and sample selection

The initial dataset of 935 firms consists of all firms listed on either the Ho Chi Minh Stock Exchange (HOSE) or the Hanoi Stock Exchange (HNX) during the period 2008–2018. Not until 2008 did the majority of Vietnamese listed firms start to disclose information on crucial aspects of corporate governance in their annual reports as being required by the first corporate governance regulations in Vietnam in 2007. Consistent with the extant literature, 64 firms in the finance sector are excluded from the sample because firms in the financial industry have strict regulations that have different influences on corporate governance mechanisms, such as board structure (Bauer et al., 2008; Kim et al., 2016). Moreover, because of their particular accounting practices, commonly used earnings management measures may be challenging for the industry (Becker et al., 1998; Chen et al., 2015). Thus, excluding financial companies from the sample makes the study's findings comparable to the prior research. Furthermore, because estimating discretionary accruals requires lagged data and at least ten firm-year observations per industry (see Equation (2)), the sample reduces to 810 non-financial firms. The final sample, with all required data available, contains 5434 firm-year observations on 800 non-financial firms, which allows the creation of a panel dataset, specifically in the control of unobserved heterogeneity (Sáenz González & García-Meca, 2014). Table 2 shows the sample selection in this study.

Data were hand-collected and cross-checked through different sources, including the websites for Ho Chi Minh Stock Exchange (HOSE), Hanoi Stock Exchange (HNX), Vietstock, and Cafef because there are as yet no official databases containing financial, market, and corporate governance information on Vietnamese listed firms. To reduce the influence of extreme values in the data, all continuous financial data are winsorized to the 1st and 99th percentiles. The results are robust to no winsorizing at all.

Table 1
Construction of the corporate governance index.

Governance categories	Notation	Definition	Points allocated
Panel A. Board of directors			
1. CEO duality	Duality	CEO also serves as the chairperson of the board	Equals one if there is no CEO duality, zero otherwise.
2. Non-executive directors	Nexpt	The percentage of non-executive directors on the board	Equals one if the majority of the board members are non-executive directors, zero otherwise.
3. Non-executive chairperson	Nex_ch	Chairperson is not an executive	Equals one if the chairperson is not in the top management team, zero otherwise.
4. Board size	Bsize	The number of directors on the board	Equals one for firms with board size larger than the legal requirement (five members) and less than two standard deviations from the mean value of board size, zero otherwise.
5. Gender diversity	FeoB	The number of females on the board	Equals one if there is at least one female on the board, zero otherwise.
6. National diversity	ForB	The number of foreign directors on the board	Equals one if there is at least one foreign director on the board, zero otherwise.
7. Blockholder directors	BlockB	The number of blockholders on the board	Equals one if there is at least one blockholder on the board, zero otherwise.
8. Board education	Bedupt	The number of directors who have a postgraduate degree	Equals one if the majority of the board members have a postgraduate degree, zero otherwise.
9. Board experience	Bexp	The number of directors having finance and accounting experience	Equals one if there is at least one director having finance and accounting experience on the board, zero otherwise.
10. Chairperson tenure	Ch_tenure	The number of years that the chairperson holds the position	Equals one for firms with chairperson tenure higher than the sample's mean value, zero otherwise.
Panel B. Supervisory board			
11. Supervisory board size	SB	The number of supervisors on the board	Equals one for firms with board size larger than the legal requirement (three members), zero otherwise.
12. Non-executive supervisors	NexSBpt	The number of non-executive directors on the board	Equals one if all supervisors are not executives of the company, zero otherwise.
13. Supervisor experience	SBexp	The number of supervisors having finance and accounting experience	Equal one if at least one supervisor has finance and accounting experience, zero otherwise.

Table 2
Sample selection.

Sample selection	
Number of listed firms on HOSE and HNX as of December 2018	935
Less number of listed financial-sector firms	64
Less number of firms in industry that has less than ten firm-year observation	61
Less firms with missing data	10
Number of firms in the sample	**800**

3.2. Research design

3.2.1. Earnings management measures

There is no perfect way to quantify earnings management (Park & Shin, 2004), so the literature has documented numerous methods to measure earnings management. Bao and Lewellyn (2017) reveal that even though managers can manipulate earnings in many different ways, managing operating accruals is more likely to be preferred, especially in developing economies, because the manipulation of operating accruals does not impact the cash flows directly and is comparatively hard to detect. Several methods have been employed to separate discretionary (abnormal) accruals from current accruals (Dechow et al., 2010). However, the most commonly used methods are the Jones (1991) and the modified Jones models (Dechow et al., 1995). Both Jones and modified Jones models estimate parameters for discretionary accruals by regressing current accruals on proxies for non-discretionary (normal) accruals. Then, they combine the estimated parameters with the event period data to derive discretionary accruals. Based on a large body of literature (Bergstresser & Philippon, 2006; Chen et al., 2015; Chi et al., 2015; Gaio & Pinto, 2018; Katmon & Farooque, 2017; Peasnell et al., 2005; Wang & Yung, 2011), this study estimates abnormal accruals using the modified Jones model. This model has been found to be more powerful than the original Jones model in terms of detecting sales-based manipulations (Dechow et al., 1995). To maximise the sample size and avoid survival bias while using a firm-specific time-series approach, following Peasnell et al. (2005) and Sáenz González and García-Meca (2014), this study estimates the modified Jones model on a cross-sectional basis.

Following Davidson et al. (2005), Katmon and Farooque (2017) and Wang and Yung (2011), this study employs a cash-flow approach to calculate total accruals. Hribar and Collins (2002) compare the accuracy of measuring accruals from the balance sheet to the statement of cash flows and provide evidence that the cash-flow approach is superior to the balance sheet approach. Thus, total accruals are computed as follows:

$$TAC_{ijt} = EBXI_{ijt} - OCF_{ijt} \tag{1}$$

Where TAC_{ijt} is the total accruals for firm i in industry j in year t, $EBXI_{it}$ is earnings before extraordinary items for firm i in industry j in year t, extracted from the income statement and OCF_{ijt} is cash flow from operations for firm i in industry j in year t, obtained from the statement of cash flows.

Following Dechow et al. (1995), to identify the non-discretionary accruals for a given firm-year observation, the following cross-sectional models are estimated for all firms in the same industry.[5] Consistent with earlier studies by Badolato et al. (2014), Dechow et al. (1995) and Koh (2003) and others, this study requires at least ten firm-year observations per industry:

$$TAC_{ijt} \big/ TA_{ijt-1} = \alpha_j \left[1 \big/ TA_{ijt-1} \right] + \beta_{1j} \left[\Delta REV_{ijt} \big/ TA_{ijt-1} \right] + \beta_{2j} \left[PPE_{ijt} \big/ TA_{ijt-1} \right] + \varepsilon_{ijt} \tag{2}$$

The estimated industry-specific coefficients $(\widehat{\alpha_j}, \widehat{\beta_{1j}}, \widehat{\beta_{2j}})$ are then employed to construct a measure of non-discretionary accruals according to the following equation:

$$NDAC_{ijt} \big/ TA_{ijt-1} = \widehat{\alpha_j} \left[1 \big/ TA_{ijt-1} \right] + \widehat{\beta_{1j}} \left[(\Delta REV_{ijt} - \Delta REC_{ijt}) \big/ TA_{ijt-1} \right] + \widehat{\beta_{2j}} \left[PPE_{ijt} \big/ TA_{ijt-1} \right] \tag{3}$$

Where TAC_{ijt} is the total accruals for firm i in industry j in year t, $NDAC_{ijt}$ is the non-discretionary accruals for firm i in industry j in year t, TA_{ijt-1} represents the total assets for firm i in industry j in year $t-1$, ΔREV_{ijt} is the change in revenue for firm i in industry j between year $t-1$ and year t, PPE_{ijt} is the level of gross property, plant, and equipment for firm i in industry j in year t, and ΔREC_{ijt} is the change in receivables for firm i in industry j between year $t-1$ and year t.

Having estimated non-discretionary accruals from equation (3), the amount of discretionary accruals for firm i in industry j in year t is calculated as the residual from equation (4) below:

$$DAC_{ijt} = TAC_{ijt} - NDAC_{ijt} \tag{4}$$

Each variable is deflated by the lagged value of total assets (TA_{t-1}) to avoid heteroscedasticity in the error term, following the existing literature.

Consistent with prior studies (Bao & Lewellyn, 2017; Bergstresser & Philippon, 2006; Davidson et al., 2005; Gaio & Pinto, 2018; Krishnan, 2005; Wang & Yung, 2011), the absolute value of discretionary accruals is employed as the proxy for earnings management. Hazarika et al. (2012) explain that managers can use discretionary accruals to increase or decrease reported earnings. Earnings tend to be manipulated upwards when managers want to boost their performance-based compensation, to raise capital, or to avoid delisting (Xie et al., 2003). Contrary to this, incentives to manage earnings downward may include attempts by managers to take advantage of events and information, such as those occurring before a reissue of options or before stock repurchases (Hazarika et al., 2012). In this way, taking the absolute value of discretionary accruals can capture managers' attempts to manage earnings in both directions. As the main hypothesis focuses on the magnitude of accruals rather than the direction or sign of manipulated accruals, this study uses the absolute value of discretionary accruals $|DAC|$ as a proxy of earnings management.

3.2.2. Model specification

To test the reported hypothesis (H1), regression Equation (5) is formulated as follows:

$$|DAC_{it}| = \alpha_0 + \beta_1 CGI_{it} + \beta_{2-13} Control_{it} + YR_t + Ind_i + \upsilon_{it} \tag{5}$$

Where $|DAC_{it}|$ is the absolute value of discretionary accruals for firm i in year t, CGI_{it} is corporate governance index for firm i in year t, and $Controls_{i,t}$ are the value of control variables for firm i in year t. YR_t and Ind_t are year dummies and industry dummies, respectively. υ_{it} represents idiosyncratic errors in the model.

This study controls for the effect of various firm-specific characteristics by including commonly used variables that the existing literature has found to influence the level of earnings management, such as government ownership (*Govown*), foreign ownership (*Forown*), ownership concentration (*Top5*), return on assets (*ROA*), market-to-book ratio (*MTB*), leverage (*TL_TA*), firm size (*Ln_TA*), operating cash flow (*OCF_LTA*), firm age (*Age*), auditor quality (*Big4*), firm loss (*Loss*), and sales growth (*Sales_growth*). The definitions of all variables in this study are listed in Table 3 below.

The random effects model (RE) is employed as the baseline model to control for unobserved heterogeneity. The standard errors are corrected for heteroscedasticity and autocorrelation and are clustered at the firm level (Petersen, 2008). Wooldridge (2016) concludes that the random effects model is more efficient than the fixed effects model when the assumption that the individual-specific effect is uncorrelated with the independent variables holds. Thus, the Hausman specification test (1978) is performed to decide whether fixed effects or random effects are best suited to the data. Wooldridge (2016) suggests that if the test rejects the outcome, the random effects model is biased, and the fixed effects model is the correct estimation method. In this study, the test result does not reject the null hypothesis of no systematic differences between the explanatory variables and unobserved heterogeneity, suggesting reliance on random effects. This method is also used in similar studies by Chi et al. (2015), Liu and Lu (2007), Sáenz González and García-Meca (2014), and Wang and Yung (2011). Therefore, it is possible for us to assess the influence of unobserved firm-level heterogeneity.

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[5] According to Hoang et al. (2016a), there are no generally accepted industry classifications for listed firms in Vietnam. So, this study follows Vietstock – the oldest financial data provider in Vietnam to use two-digit NAICS codes to classify firms operating in the same industry.

Table 3
Variable definitions.

Notation	Variable name	Measures
Panel A: Earnings management		
|DAC|	Discretionary accruals	The absolute value of discretionary accruals, as measured by the cross-sectional modified Jones model.
Panel B: Corporate governance measures		
CGI	Corporate governance index	CG Index is a self-constructed index based on 13 respective criteria and then normalised, which ranges from zero to 100 percent each year.
Panel C: Firm attributes		
Govown	Government ownership	The ownership percentage of the state
Forown	Foreign ownership	The ownership percentage of foreign shareholders
Top5	Concentrated ownership	The ownership percentage of the top five largest shareholders
ROA	Return on assets	Earnings before extraordinary items divided by total assets
MTB	Market-to-book	Book value of debt divided by market value of equity
TL_TA	Leverage	Total liabilities divided by total assets
Ln_TA	Firm size	Natural logarithm of total assets
OCF_LTA		Cash flow from operations scaled by lagged total assets
Age		Number of years since a firm's IPO
Big4		A dummy variable that takes the value of one if the company is audited by the big four audit firms and zero otherwise
Loss		A dummy variable that takes the value of one if the firm has had losses in the last two years and zero otherwise
Sales_growth		The percentage of sales growth in the current period

3.3. Descriptive statistics and pair-wise correlation

Table 4 presents descriptive statistics for all firm-year observations of the entire sample. Descriptive data on measures of discretionary accruals and other variables are reported in Panel A of Table 4. The mean (median) of earnings management in terms of discretionary accruals is 0.003 (0). Nearly 50 percent of the discretionary accruals are positive, which shows no evidence of systematic income-increasing or income-decreasing earnings manipulation. This may be because the sample includes all non-financial listed firms on the Vietnamese stock exchange is a relatively random sample regarding the incentives of earnings management (Klein, 2002). Affirmed here is the decision to use the unsigned discretionary accruals as a proxy for the combined effect of upward and downward earnings management. The mean (median) absolute value of discretionary accruals estimated using the modified Jones model is 0.087 (0.062), with a standard deviation of 0.084. With reference to the corporate governance index, the mean (median) of *CGI* is 0.479 (0.462), suggesting that, on average, the corporate governance practices of the sample firms are quite weak, satisfying less than half of the best practice standards. While on average, the state owns 24.20 percent of the company's issued equity capital, those owned by the foreign shareholders and top five largest shareholders are 9.00 percent and 47.90 percent, respectively. This indicates the high levels of government ownership and ownership concentration among listed firms in Vietnam. The means (medians) of return on assets (*ROA)* and growth opportunities (*MTB)* are 0.050 (0.045) and 1.013 (0.784), respectively. They carry a high level of debt of 51.40 percent on average in their capital structure. The average *OCF_LTA* in the sample is 3.60 percent. On average, the sample firms are 6.54 years old, and 19.2 percent of the firms employ Big4 auditor firms. Around four percent of firms in the sample experience losses in two consecutive years. Their sales growth, on average, is 14.40 percent.

Panel B of Table 4 shows year-wise and industry-wise descriptive statistics of the absolute value of discretionary accruals and corporate governance index. Over the sample period, the means of |*DAC*| and *CGI* do not change substantially. With regard to the sectors, as mentioned in the research design section, this study requires at least ten firm-year observations per industry to construct the value of discretionary accruals. Thus, there are ten industries in the final sample. While the wholesale trade has the highest level of earnings management measured by the absolute value of discretionary accruals, with the mean value of 0.106, the information and technology sector has the lowest average value of 0.064. Of the ten industries in the sample, the utilities sector has the highest mean of *CGI* of 0.505, while mining has the lowest mean of 0.435.

In Table 5, the correlation matrix of all variables is reported, using the Pearson product-moment correlations to measure the strength of association between variables. Talln-ballesteros (2019) suggests that a correlation coefficient of 0.6 or higher in absolute terms indicates a relatively high level of multicollinearity. In this study, the highest correlation coefficient is 0.5 between *Govown* and *Top5*. There are no concerns raised here about multicollinearity. To further detect multicollinearity in the regression models, a variance inflation factor (VIF) is calculated for each parameter (not tabulated). VIF specifies the magnitude of the inflation in the standard errors related to a particular beta weight as a consequence of multicollinearity. A VIF value higher than 2.50 is considered problematic (Allison, 1999). In this study, the highest VIF is 1.57, suggesting no multicollinearity issues or overfitting in the regression models. The correlation between the corporate governance index (*CGI*) and the absolute value of discretionary accruals (|DAC|) is statistically significant at the one percent level and has its expected sign.

Table 4
Descriptive statistics.

Panel A: Descriptive statistics								
Variable	N	Mean	Std. Dev.	P1	P25	Median	P75	P99
DAC	5434	0.003	0.120	−0.325	−.061	0	.063	0.394
|DAC|	5434	0.087	0.084	0.001	.027	0.062	.119	0.401
CGI	5434	0.479	0.118	0.231	.385	0.462	.538	0.692
Govown	5434	0.242	0.251	0	0	0.164	.51	0.795
Forown	5434	0.090	0.129	0	.005	0.031	.123	0.490
Top5	5434	0.479	0.206	0.053	.33	0.510	.617	0.905
ROA	5434	0.050	0.123	−0.274	.013	0.045	.091	0.307
MTB	5434	1.013	0.822	0.15	.485	0.784	1.251	4.924
TL_TA	5434	0.514	0.228	0.042	.334	0.538	.692	0.96
ln_TA	5434	13.211	1.468	9.935	12.262	13.188	14.18	17.031
OCF_LTA	5434	0.036	0.119	−0.332	0	0	.091	0.418
Age	5434	6.544	3.222	2	4	6	9	15
Big4	5434	0.192	0.394	0	0	0	0	1
Loss	5434	0.043	0.203	0	0	0	0	1
Sales_growth	5434	0.144	0.567	−0.837	−0.1	0.073	.24	3.474

Panel B: Year-wise averages of the absolute value of discretionary accruals and corporate governance index			
	N	|DAC|	CGI
2009	293	0.110	0.423
2010	392	0.092	0.436
2011	558	0.084	0.454
2012	609	0.076	0.477
2013	597	0.077	0.504
2014	586	0.083	0.511
2015	571	0.087	0.520
2016	597	0.092	0.522
2017	614	0.093	0.450
2018	617	0.092	0.461

Panel C: Industry-wise averages of the absolute value of discretionary accruals and corporate governance index			
	N	|DAC|	CGI
Agriculture	22	0.093	0.458
Construction and Real Estate	1498	0.077	0.472
Information and Technology	264	0.064	0.483
Manufacturing	2011	0.094	0.490
Mining	305	0.101	0.435
Professional, Scientific, and Technical Services	86	0.071	0.454
Retail trade	136	0.089	0.488
Transportation and Warehousing	431	0.085	0.467
Utilities	259	0.078	0.505
Wholesale Trade	422	0.106	0.490

This table shows summary statistics of all variables for firm-year observations of the non-financial firms listed on HOSE and HNX from 2009 to 2018. Panel A shows a summary of descriptive statistics for the entire sample. Panels B and C present the year-wise and industry-wise averages of the absolute value of discretionary accruals and corporate governance index. See Table .3 for definitions of variables.

4. Empirical results

4.1. Main results

4.1.1. Model estimation

To test whether firms with higher quality corporate governance have less earnings management (H1), random effects regression, including year and industry fixed effects, is employed. Standard errors are clustered at the firm level to control for heteroscedasticity and autocorrelation (Petersen, 2008). Column (1) of Table 6 shows the results of Equation (5), where *CGI* is a self-constructed corporate governance index, and earnings management is measured by the absolute value of discretionary accruals.

In line with the hypothesis (H1), the result shows that *CGI* has a negative and statistically significant relationship with earnings

Table 5
Pair-wise correlation.

Variables	|DAC|	CGI	Govown	Forown	Top5	ROA	MTB	TL_TA	Ln_TA	OCF_LTA	Age	Big4	Loss
CGI	−0.056												
Govown	−0.061	−0.136											
Forown	−0.006	0.238	−0.142										
Top5	−0.049	0.080	0.500	0.063									
ROA	−0.047	0.052	0.115	0.153	0.117								
MTB	0.103	0.049	0.035	0.237	0.177	0.252							
TL_TA	−0.041	−0.085	0.080	−0.198	0.059	−0.304	−0.058						
ln_TA	−0.023	0.139	0.005	0.308	0.107	0.045	0.142	0.292					
OCF_LTA	−0.048	0.031	0.141	0.119	0.138	0.208	0.231	−0.143	0.047				
Age	−0.020	0.134	−0.046	0.226	0.086	0.004	0.020	−0.065	0.133	0.024			
Big4	−0.036	0.145	0.054	0.281	0.191	0.026	0.128	0.025	0.438	0.087	0.168		
Loss	0.098	−0.022	−0.046	−0.063	−0.043	−0.394	−0.009	0.122	−0.098	−0.047	−0.014	−0.037	
Sales_growth	0.057	0.010	−0.081	0.022	−0.049	0.119	0.055	−0.018	0.079	−0.005	−0.028	0.003	−0.101

This table reports the Pearson correlations of the variables used in our analyses. See Table 3 for variable definitions. Correlation coefficients significant at the 5% level or higher are in bold.

Table 6

Corporate governance quality and earnings management: Random effects model (RE).

Dependent Variable	Exp. sign	|DAC|	|DAC|
		(1)	(2)
CGI	-	−0.036***	
		(-2.97)	
BODI	-		−0.029***
			(-2.985)
SBI	-		−0.000
			(-0.038)
Govown	+/−	−0.007	−0.007
		(-0.95)	(-0.974)
Forown	+/−	0.003	0.004
		(0.23)	(0.254)
Top5	+/−	−0.020**	−0.020**
		(-2.29)	(-2.275)
ROA	-	−0.038*	−0.038*
		(-1.89)	(-1.888)
MTB	+	0.012***	0.012***
		(5.20)	(5.215)
TL_TA	+/−	−0.020**	−0.020**
		(-2.21)	(-2.196)
ln_TA	-	0.000	0.000
		(0.03)	(0.026)
OCF_LTA	-	−0.042**	−0.042**
		(-2.08)	(-2.092)
Age	-	−0.001	−0.001
		(-1.31)	(-1.285)
Big4	-	−0.004	−0.004
		(-1.01)	(-1.009)
Loss	+	0.037***	0.037***
		(5.30)	(5.291)
Sales_growth	+	0.009***	0.009***
		(3.86)	(3.856)
Year fixed effects		Yes	Yes
Industry fixed effects		Yes	Yes
Constant		0.135***	0.130***
		(5.25)	(4.934)
R^2		0.060	0.060
Observations		5434	5434

The table shows the regression results using the RE method. See Table 3 for definitions of variables. Column (1) shows the results of examining the impact of the aggregate corporate governance index on earnings management. Column (2) presents the results of examining the effect of individual governance categories on earnings management. Figures in parentheses are the z-statistics. Standard errors are clustered at the firm level. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

management measured by the absolute value of discretionary accruals, suggesting that better-governed firms experience a lower level of earnings management. Proper corporate governance mechanisms can effectively discipline the listed firms and help reduce their earnings management incentives.[6] The result shows that a one-unit rise in *CGI* decreases |DAC| by 0.036 points.[7] In terms of the economic significance of the result, an increase in *CGI* by one standard deviation decreases |DAC| by 0.43 percent, which is equivalent to 4.88 percent of the average |DAC| and 5.10 percent of the standard deviation of |DAC|.[8] This outcome supports H1, implying that firms with high quality corporate governance procedures in place are less likely to distort earnings. This is consistent with the theories and findings from empirical research that highlight the critical roles of corporate governance in reducing the agency problem and information asymmetry, resulting in reduced managerial opportunism and reducing firm risk (Ali et al., 2017; Cheung et al., 2010). The aggregate corporate governance index can be used as a benchmark in screening stocks that are more likely to provide accurate and transparent financial information.

Firm-specific variables also provide important insights. In particular, the results show that the discretionary earnings quality is

[6] The baseline regression is estimated using pooled ordinary least squares method (OLS), including year and industry fixed effects and fixed effects method (FE). The results based on pooled OLS and FE are qualitatively similar.

[7] Thanks to the suggestion of the reviewer, we have further included firm fixed effects in our regression and found that the result remains consistent. In our new regression, a one-unit rise in CGI decreases |DAC| by 0.032 points, a marginal change from 0.036. The negative coefficient is statistically significant at the five percent level. For brevity, we do not report the results.

[8] The coefficient on *CGI*, i.e. −0.036 in Table 6 is multiplied by the standard deviation of *CGI*, i.e. 0.118, then is divided by the mean and standard deviation of |DAC|, i.e. 0.087 and 0.084 from Table 4, and get 0.049 and 0.051, respectively.

lower in firms with lower ownership concentration (*Top5*), lower profitability (*ROA*), more growth opportunities (*MTB*), lower leverage (*TL_TA*), less operating cash flows (*OCF_LTA*), experiencing losses in two consecutive years (*Loss*), and having a higher growth rate of sales (*Sales_growth*). However, this study does not find any significant relationships between government ownership, foreign ownership, firm size, firm age, and auditor quality and the level of discretionary accruals. All signs are consistent with the expectations. As shown in Table 6, the R^2 obtained in this study is relatively comparable with those in similar studies, for example, Ding et al. (2007) and Liu and Lu's (2007) R^2 range from 3.80 to 6.20 percent and 1.32–7.99 percent, respectively, while those of Chen et al. (2015) are at approximately 11 percent. The empirical results, so far, indicate that corporate governance quality has a negative and significant association with earnings management.

This study further investigates which governance categories (board of directors and supervisory board) have a more pronounced impact on earnings management. Ten corporate governance characteristics that are assigned to the board of directors category (see Panel A of Table 1) and three governance attributes to the supervisory board category (see Panel B of Table 1). Each variable is assigned to have binary signals and aggregated to yield a composite index. The index ranges from zero to ten for the category of board of directors (BODI) and from zero to three for the supervisory board (SBI). Following Aman and Nguyen (2008), the indices are normalised linearly between zero and 100 percent. The higher the indices, the better the firm is expected to be governed. CGI is replaced with BODI and SBI and Equation (5) is re-estimated. The results are presented in Column (2) of Table 6.

The regression results show that both governance categories are negatively related to earnings management. However, the association between corporate governance and earnings management is mainly driven by the board of director category. This indicates that the board of director plays a more substantial role in restraining earnings management in Vietnam, which is consistent with the notation that the board of directors is directly associated with management monitoring; therefore, limiting the opportunity to distort earnings. While the supervisory board is specialised for supervising financial reporting and audit activities, it is expected to provide shareholders with the highest protection in upholding the credibility of a firm's financial statements. However, the findings suggest that the supervisory board is not a significant driver of reducing earnings manipulation. Consequently, this calls for measures to enhance the effectiveness of the supervisory board in deterring and detecting earnings distortion in Vietnamese companies.

4.1.2. Endogeneity issues

It has been well-documented in the literature that endogeneity is a common problem in research on corporate governance (Wintoki et al., 2012). Unobserved heterogeneity, reverse causality and sample selection bias have been identified as three major sources of endogeneity (Kabir et al., 2020). The unobserved heterogeneity bias is addressed by using the random effects method in the baseline regression (see Table 6). In this section, the concerns about reverse causality and sample selection bias are addressed by using three alternative model specifications.

A potential simultaneity bias in this context may be that not only better corporate governance quality reduces earnings distortion, but also firms that manage earnings aggressively might reconfigure their governance structure to assist their activities. For instance, firms with a higher level of earnings management may nominate directors who are less likely to monitor and lack expertise to detect wrongdoings and dismiss experienced directors, leading to poorer quality corporate governance. To address the possible reverse causality bias, four model specifications are used as reported in Table 7. The first alternative model replaces *CGI* with a dummy variable, *CGIDEC*, which is equal to one if the corporate governance quality decreases, and zero otherwise. The second alternative model replaces *CGI with ΔCGI*, a continuous variable showing the changes in corporate governance index. Following Zhang et al. (2019), we have regressed these alternative variables on the absolute discretionary accruals as shown in columns (1) and (2).

Table 7

Corporate governance and earnings management: Addressing reverse causality.

Dependent Variable	|DAC|	|DAC|	|ΔDAC|	|ΔDAC|
	(1)	(2)	(3)	(4)
CGIDEC	0.010*** (3.21)		0.009** (2.09)	
ΔCGI		−0.039*** (−3.18)		−0.034* (−1.80)
Govown	−0.002 (−0.21)	−0.001 (−0.19)	0.007 (1.46)	0.007 (1.53)
Forown	−0.005 (−0.31)	−0.005 (−0.33)	−0.008 (−0.88)	−0.009 (−0.92)
Top5	−0.023** (−2.47)	−0.023*** (−2.45)	−0.011* (−1.86)	−0.011* (−1.87)
Control variables	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Constant	0.026*** (4.73)	0.059* (−1.68)	0.026*** (4.73)	0.059* (−1.68)
R^2	0.020	0.060	0.020	0.060
Observations	4625	4625	4625	4625

The table shows the effects of corporate governance on earnings management after addressing the endogenous issue of reverse causality using the RE method. Standard errors are clustered at the firm level. See Table 3 for definitions of variables. Δ|DAC| represents the change in the absolute value of discretionary accruals of firms. Column (1) shows the results of examining the impact of lower corporate governance quality on absolute discretionary accruals. Column (2) presents the effect of the changes in corporate governance quality on absolute discretionary accruals. Column (3) shows the effect of lower corporate governance quality on changes in absolute discretionary accruals. Column (4) presents the effect of the changes in corporate governance quality on changes in absolute discretionary accruals. CGIDEC is a dummy variable which is equal to one if the corporate governance quality decreases. ΔCGI represents the change in corporate governance quality of firms. Figures in parentheses are the z-statistics. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Additionally, we have repeated this process with dependent variable being the changes in the absolute discretionary accruals (ΔDAC) as shown in columns (3) and (4).

It is observed that coefficients of *CGIDEC* are significantly positive, indicating that the decline in corporate governance index can deteriorate the discretionary earnings quality. As well, the significant negative coefficients of ΔCGI suggest that as corporate governance quality increases (decreases), firms tend to engage in less (more) earnings management. The evidence supports the notion that the changes in a firm's corporate governance quality impact on its level of earnings management, rather than earnings management influencing the corporate governance practices of firms.

To further address the simultaneity issue, we have employed the instrumental variable (IV) approach and estimated the main regression model using the two-stage least squares method. A valid IV needs to be strongly correlated with the corporate governance index but is not directly associated with earnings management. Following Ali et al. (2018) and Fisman and Svensson (2007), this study employs the *industry-location-average CGI* as an IV by calculating the average value of the corporate governance index of all firms located in the same city in the firm *i*'s industry. Ali et al. (2018) propose that corporate governance of a firm includes two components, one industry-specific and the other particular to the firm:

$$b_{ijt} = B_{ijt} + B_{jt} \tag{6}$$

Where B_{ijt} is the firm *i*'s corporate governance in industry *j* in year *t*, which represents the idiosyncratic component, while B_{jt} is a portion of corporate governance that relates to a specific industry in a specified geographical location in year *t*. According to Yang and Zhao (2014), a firm's governance structure tends to associate with its industry peers because of similar business mix and investment prospects; however, it is unlikely that an individual firm's engagement in earnings manipulation is directly affected by the industry average; rather, it would be by the firm's governance structure. Similarly, following Fisman and Svensson (2007), it is expected that corporate governance differs from location to location because businesses in more developed regions are subjected to more intense scrutiny by regulators. They tend to comply more with government rules and regulations and have better quality corporate governance.[9] Therefore, the first-stage regression is a generalised linear regression model with *CGI* as the dependent variable and the *industry-location-average CGI* (B_{jt}), and other control variables as the independent variables to find the fitted value for b_{ijt}.

$$CGI_{it} = \alpha_0 + \beta_1 IV_i + \beta_{2-13} Control_{it} + YR_t + Ind_i + v_{it} \tag{7}$$

Where IV_i is the mean value of the corporate governance index of all firms located in the same city in the firm *i*'s industry.

Then, in the second stage, this study models earnings management as a function of the fitted value of *CGI* from the first-stage regression and other control variables:

$$|DAC_{it}| = \alpha_0 + \beta_1 FittedCGI_{it} + \beta_{2-13} Control_{it} + YR_t + Ind_i + v_{it} \tag{8}$$

Where $FittedCGI_{i,t}$ is the fitted corporate governance index for firm *i* in year *t*.

The results of the two-stage least squares method are reported in Table 8.

Column (1) of Table 8 displays the first-stage regression results. The coefficient on the *industry-location average CGI* is positive and statistically significant at the one percent level, implying that the *industry-location average CGI* powerfully explains the firm-level *CGI*. Moreover, the validity of the IV is confirmed by the F-test for the joint significance of the instrument. As a rule of thumb, an IV is not weak if the F-statistics is higher than ten and is statistically significant based on Wald Chi-square statistics (Dhawan et al., 2020). The F-statistics for the IV is 700.80 and statistically significant at the one percent level and therefore it is valid. Column (2) of Table 8 demonstrates the second-stage regression results. *CGI* is replaced by the *fitted CGI* from the first-stage regressions. The coefficient of the fitted value is negative and statistically significant at the five percent level, which confirms the findings that better corporate governance may mitigate earnings management. It is concluded that the results are validated after corrections for potential simultaneity bias.

The propensity score matching (PSM) technique is used as the third alternative model specification to address concerns about sample selection bias that may affect the estimation of the coefficient for the corporate governance index. The sample is first divided into a control and a treatment sample based on the main treatment of interest (corporate governance index in this study). All firm-year observations with a *CGI* of more than the mean value of 0.48 is assigned as treatment observations and all observations with a *CGI* of equal or less than 0.48 as control observations. In the matching process, for each firm-year observation in the treatment sample, an observation in the control sample with the nearest propensity score of firm characteristics in the same year from the same industry is identified. Control observations are then matched to the treatment observations. Finally, the mean of the dependent variable ($|DAC|$ in this case) conditional on the control variables and year and industry fixed effects of the control and treatment samples are compared. To do this, this study executes a regression where the dependent variable is $|DAC|$, and independent variables are *Treatment*, a dummy variable that equals one if a firm-year observation is in the treatment group, zero if it is in the control group, along with other control variables.

The result of the propensity score matching analysis is reported in Panel A of Table 9. The coefficient estimate for *Treatment*, which represents the difference in mean of $|DAC|$ between the treatment and control sample, is negative and statistically significant at the five

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[9] The average corporate governance index of firms located in Hanoi and Ho Chi Minh where the two exchanges located is calculated (unreported results). It is found that the average index of those firms is higher than that of firms located outside those two cities.

Table 8

Corporate governance and earnings management: Instrumental variable two-stage least squares (2SLS) regression.

Dependent variable:	First-stage	Second-stage
	(1)	(2)
	CGI	|DAC|
Industry-location average CGI	0.860*** (26.45)	
Fitted CGI		−0.071** (−2.13)
Govown	−0.060*** (−9.07)	−0.014** (−2.18)
Forown	0.125*** (9.57)	0.001 (0.10)
Top5	0.627*** (7.31)	−0.008 (−1.05)
ROA	0.016 (1.25)	−0.020 (−0.95)
MTB	0.000 (0.32)	0.004*** (2.84)
TL_TA	−0.029*** (−3.72)	−0.016** (−2.24)
ln_TA	0.005*** (3.88)	0.000 (0.14)
OCF_LTA	0.008 (0.58)	0.002 (−0.11)
Age	−0.001 (−0.56)	−0.003 (−1.46)
Big4	0.003 (0.84)	−0.002 (−0.73)
Loss	−0.000 (−0.04)	0.038*** (5.73)
Sales_growth	−0.000 (−1.74)	0.000*** (7.21)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Constant	−0.029 (−1.28)	0.159*** (8.66)
Model fits		
F-test (instrument)	700.80***	
R^2	0.254	0.047
Observations	5434	5434

This table demonstrates the first- and second-regression results from the two-stage instrumental variable regression approach. See Table 3 for definitions of variables. The instrument variable used is the industry-location-average corporate governance index. Figures in parentheses are t-statistics. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

percent level. This result is consistent with the regressions using other methods, i.e. RE, and IV methods, which confirms that the main results are robust after considering the endogeneity issues using alternative estimation methods.

Two diagnostic tests are performed to assess the validity of the method. The first test compares pre-match and post-match samples. The results are presented in Panel B of Table 9. None of the coefficient estimates in the post-match sample is statistically significant, indicating that no distinguishable trends in |DAC| between the two groups are observed. In addition, the pseudo R^2 decreases significantly from 0.092 to 0.001, suggesting that the PSM method eliminates all the observable differences.

The difference for each observable characteristic between the treated and the control firms is then studied. The results are reported in Panel C of Table 9. As a rule of thumb, a good balance between observable covariates is achieved when t-tests failed to reject the null-hypothesis of equal means, and the bias percentage is less than five percent. The highest bias percentage is 2.9 percent for *Sale_growth,* and none of the p-values is lower than 0.05. The results confirmed that the covariates are well-balanced.

Overall, we acknowledge that it is often difficult, if not impossible, to eliminate endogeneity completely. However, the various tests, based on using instrumental variables, firm fixed effects, and propensity score matching methods, should provide a certain degree of comfort that even when endogeneity due to omitted variable and reverse-causality is considered, the main findings about the negative influence of corporate governance on earnings management remain unchanged.

4.2. Additional analyses

4.2.1. Effects of ownership structure

In this section, we further investigate the impact of corporate governance on the level of earnings management under different characteristics of ownership, including government ownership, foreign ownership, and concentrated ownership. There have been mixed arguments, yet limited, of their roles on the quality of corporate earnings. Several studies find that management of Chinese SOEs with low level of foreign ownership and highly concentrated ownership is more likely to make its discretion in financial reporting in the form of tunnelling (Aharony et al., 2010; Chen & Yuan, 2004; Firth et al., 2007). However, empirical evidence with competing views also suggests that SOEs in China are less incentivised to engage in manipulating earnings as they have more advantage to access to resources and markets (Guo & Ma, 2015; Wang & Yung, 2011) and high level of foreign ownership mitigates earnings manipulation activities due to monitoring benefits and greater market disciplines (Guo & Ma, 2015; Han et al., 2022). Following the latter argument, we have developed our conjecture in the context of Vietnamese institutions as below.

According to Article 4 under the Law on Enterprise 2005, a firm is identified as an SOE if the government holds more than 50 percent of the outstanding shares. Liu and Lu (2007) and Wang and Yung (2011) provide evidence that the government's protection of SOEs in China might reduce the pressure on managers to falsify financial statements. Additionally, Cheng et al. (2015) examine 437 IPO firms in China and conclude that Chinese SOEs distort earnings less than non-SOEs because of the easy accessibility to bank loans. To this end, managers in SOEs have lower incentives to manipulate earnings, earnings management may not depend on the quality of

Table 9

Corporate governance and earnings management: Propensity score matching (PSM).

Panel A: Regression analysis	
Dependent variable:	|DAC|
Treatment	−0.007** (−2.52)
Govown	−0.006 (−0.96)
Forown	0.000 (−0.03)
Top5	−0.005 (−0.69)
ROA	−0.011 (−0.73)
MTB	0.006*** (4.85)
TL_TA	−0.020*** (−2.82)
ln_TA	−0.001 (−0.74)
OCF_LTA	−0.004 (−0.31)
Age	−0.003 (−1.16)
Big4	−0.003 (−0.67)
Loss	0.034*** (4.79)
Sales_growth	0.002 (1.42)
Year fixed effects	Yes
Industry fixed effects	Yes
Constant	0.146*** (5.14)
R^2	0.047
Observations	3822

Panel B: Pre-match and post-match regressions		
Dependent variable:	Treatment	Treatment
	Pre-match	Post-match
	(1)	(2)
Govown	−1.313*** (−9.01)	0.063 (0.38)
Forown	1.927*** (7.16)	0.007 (0.02)
Top5	1.108*** (6.40)	−0.107 (−0.55)
ROA	0.269 (0.83)	−0.039 (−0.10)
MTB	0.033 (1.38)	−0.021 (−0.74)
TL_TA	−0.648*** (−4.15)	0.094 (0.53)
ln_TA	0.102*** (3.98)	0.003 (0.11)
OCF_LTA	−0.018 (−0.07)	0.034 (0.11)
Age	−0.015 (−0.31)	0.006 (0.12)
Big4	0.151* (1.75)	0.041 (0.42)
Loss	−0.012 (−0.07)	0.073 (0.42)
Sales_growth	−0.008 (−0.81)	0.027 (0.92)
Constant	−1.274*** (−4.14)	0.080 (0.12)
Pseudo R^2	0.092	0.001
Observations	5434	3822

Panel C: Balance test				
Variable	Treated	Control	% bias	t-stat
	(1)	(2)	(3)	(4)
Govown	0.234	0.233	0.10	0.030
Forown	0.086	0.086	0.10	0.040
Top5	0.475	0.478	−1.30	−0.390
ROA	0.050	0.051	−1.50	−0.480
MTB	1.014	1.041	−2.30	−0.700
TL_TA	0.512	0.508	1.60	0.480
ln_TA	13.187	13.178	0.60	0.180
OCF_LTA	0.035	0.035	−0.10	−0.040
Age	2.945	2.944	0.10	0.040
Big4	0.189	0.183	1.60	0.500
Loss	0.046	0.042	1.50	0.470
Sales_growth	0.206	0.173	2.90	0.880

This table demonstrates the PSM results. See Table 3 for definitions of variables. Panel A reports multivariate results relating earnings management and corporate governance. Panel B presents the coefficient estimates from the logit model which are employed to estimate the propensity scores. The dependent variable Treatment is an indicator variable set to one if a firm has a CGI of more than the mean value of 0.48 in a given year, zero otherwise. Panel B shows the pre-match and post-match regressions. Panel C reports the results of a balance test. Figures in parentheses are t-statistics.

Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

corporate governance, which weakens the relationship between corporate governance and earnings management. In contrast, without the government's helping hand, non-SOEs are more likely to distort earnings because of the administrative governance approach in Vietnam, which relies mainly on accounting information to govern listed firms. For instance, to issue additional shares to existing shareholders, a listed firm needs to obtain a positive return on equity (ROE). Thus, managers have strong incentives to manage earnings to achieve their purposes. It is, therefore, expected that the impact of better corporate governance quality on restraining earnings management can be more profound for non-SOEs than SOEs in Vietnam.

Kabir and Thai (2017) suggest that foreign investors tend to have higher commitments and longer-term investment horizons in emerging markets. It is expected that at a low shareholding, foreign ownership does not motivate foreign investors' engagement in monitoring activities because they can offload their shares without huge losses. However, when foreign investors hold a sufficiently large proportion of the shares, the option to exit becomes more costly because of the substantial discounts on the sales of large blocks. In addition, due to the significant monetary value tied to the large shareholding, foreign investors may lose more than small investors if they remain inactive or choose to be less-informed about their invested firms. Thus, at high ownership levels, where monitoring becomes less costly than the exit option, foreign shareholders have strong incentives to supervise their invested firms and restrain earnings manipulation, which is consistent with the long-term oriented view. It is postulated that the impact of corporate governance on earnings distortion may be stronger in firms with high foreign ownership.

In Vietnam, the average share ownership of the top five largest shareholders is approximately 50 percent of the outstanding equity, which indicates the existence of high concentrated ownership in Vietnamese listed firms. In emerging markets, where there is weak protection in place for minority shareholders, agency conflicts between controlling and minority shareholders are relatively high. Thus, ownership concentration may lead to a situation where large shareholders exercise their control rights and gain self-interest at the expense of minority shareholders (Liu et al., 2015). The dominance of ownership concentration may impede the monitoring functions of the board. Controlling shareholders might select directors who are less likely to monitor and are more likely to make decisions supporting their interests (Yeh & Woidtke, 2005). As a consequence, there is a risk of collusion between controlling shareholders and their selected directors to exploit the benefits of minority shareholders (Lin et al., 2010). For this reason, it is expected that the benefits of good corporate governance on restraining managerial wrongdoings will be less in firms with high ownership concentration.

The sample is split into six subsamples: SOEs and non-SOEs, high and low foreign ownership, high and low concentrated ownership. A firm is deemed to be a SOE if the government holds more than 50 percent of the outstanding shares. Based on sample median, firms are classified into high foreign and concentrated ownership (e.g., if foreign and top five largest ownership is higher or equal the sample median), and low foreign and concentrated ownership (e.g., if foreign and top five largest ownership is lower than the sample median). Empirically, Equation (5) is re-estimated using six separate subsamples. Regression results are estimated using the random effects method and reported in Table 10. Specifically, Columns (1)–(2), (3)–(4), and (5)–(6) are results of using subsamples of non-SOEs and SOEs, high and low foreign ownership, and high and low concentrated ownership, respectively.

It is observed that the coefficients of *CGI* are negative and statistically significant at the one percent level for non-SOEs and firms with low concentrated ownership, and at the five percent level for firms with high foreign ownership[10]. Meanwhile, the coefficients on CGI are statistically insignificant in regressions for SOEs, firms with high ownership concentration, and low foreign ownership. Results suggest that only non-SOEs, firms with low concentrated and high foreign ownership may benefit from the reduction in earnings management if corporate governance quality increases. This can be explained by the more efficient monitoring and supervising mechanisms these companies implement, which may more effectively constrain managerial opportunism and misbehaviour. These results confirm that ownership structure is expected to influence the link between corporate governance and earnings management.

4.2.2. Effects of growth opportunities

In this section, the importance of growth opportunities in moderating the association between corporate governance and earnings management is examined. Agency theorists have documented that efficient corporate governance plays a significant role in mitigating information asymmetry (Bhojraj & Sengupta, 2003; Shleifer & Vishny, 1997). Nevertheless, the level of information asymmetry is different across firms. Ali et al. (2018) suggest that in firms with higher growth opportunities, the issue of information asymmetry is more severe as these firm tend to have many growth perspectives; therefore, their managers are more likely to obtain more private information about firms' future projects. High growth firms, thus, are subject to higher monitoring costs (Linck et al., 2008), which may influence firms' governance structure and their outcomes. Ali et al. (2018) document the role of corporate governance in reducing the risk of default by eliminating information asymmetry between managers and shareholders, especially in high growth firms which may suffer more from such problem. Thus, it is proposed that corporate governance has a stronger effect on restraining earnings manipulation in firms with more growth opportunities.

Following Ali et al. (2018); Hazarika et al. (2012), this study uses two proxies for firms' growth opportunities, i.e. the market-to-book *(MTB)* and Tobin's Q *(TobinQ)*. Market-to-book is the market value of equity divided by its book value, while Tobin's Q equals the market value of a company divided by its book value of assets. Higher *MTB* and *TobinQ* imply higher growth opportunities.

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[10] The difference in coefficients of CGI is statistically significant at the 5% and 10% levels for the subsamples of government ownership and foreign ownership, respectively.

Table 10

Corporate governance and earnings management: The role of ownership structure.

Dependent variable	SOEs	Non-SOEs	High foreign ownership	Low foreign ownership	High concentrated ownership	Low concentrated ownership
	|DAC|	|DAC|	|DAC|	|DAC|	|DAC|	|DAC|
	(1)	(2)	(3)	(4)	(5)	(6)
CGI	−0.007 (−0.36)	−0.039*** (2.75)	−0.035** (−2.22)	−0.026 (−1.46)	−0.019 (−1.24)	−0.056*** (−3.17)
Govown		−0.019** (−2.00)	0.004 (0.44)		−0.007 (−0.93)	−0.031** (−2.31)
Forown	0.060 (1.29)	0.003 (0.17)			−0.002 (−0.11)	0.001 (0.06)
Top5	0.004 (0.16)	−0.027*** (−2.86)	−0.016 (−1.40)	−0.022* (−1.71)		
ROA	0.088 (1.28)	−0.054*** (−2.89)	0.007 (0.15)	−0.059*** (−3.14)	0.074 (1.48)	−0.059*** (−3.21)
MTB	0.011* (1.85)	0.011*** (4.72)	0.013*** (3.71)	0.011*** (3.39)	0.008** (2.34)	0.014*** (4.74)
TL_TA	0.006 (0.32)	−0.022** (−2.11)	0.014 (1.03)	−0.050*** (−4.09)	0.014 (1.03)	−0.033*** (−2.67)
ln_TA	−0.006*** (−2.81)	0.002 (0.96)	−0.004** (−2.29)	0.005** (2.54)	−0.002 (−1.14)	0.002 (0.77)
OCF_LTA	0.032 (0.95)	−0.073*** (−2.98)	−0.042 (−1.56)	−0.049 (−1.56)	0.001 (0.05)	−0.089*** (−3.00)
Age	−0.001 (−0.87)	−0.001 (−1.10)	−0.001 (−0.97)	−0.001 (−0.81)	0.000 (−0.51)	−0.001 (−0.72)
Big4	0.007 (1.19)	−0.004 (−0.69)	−0.004 (−0.28)	0.001 (0.14)	0.001 (0.30)	−0.011* (−1.80)
Loss	0.058*** (3.22)	0.035*** (4.68)	0.032** (2.41)	0.038*** (4.83)	0.041*** (3.62)	0.038*** (4.43)
Sales_growth	0.014** (2.02)	0.008*** (3.32)	0.006* (1.77)	0.011*** (3.42)	0.010** (2.54)	0.007** (2.34)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.094	0.069	0.062	0.083	0.053	0.095
Observations	1514	3920	2734	2700	2783	2651

The table shows the regression results of corporate governance on earnings management based on different types of ownership using the RE method. Standard errors are clustered at the firm level. A firm is considered to be a SOE and having high foreign and concentrated ownership if its government ownership is higher than 50 percent of the outstanding shares, its foreign and top five largest ownership is higher than the sample median, respectively, and vice versa. The significance of the difference in coefficients of corporate governance index across two groups for the subsamples of government ownership and foreign ownership is statistically significant at the 5% and 10% levels, respectively. See Table 3 for definitions of variables. Figures in parentheses are the z-statistics. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 11

Corporate governance and earnings management: The role of growth opportunities.

Dependent Variable	MTB		Tobin's Q	
	High	Low	High	Low
	|DAC|	|DAC|	|DAC|	|DAC|
	(1)	(2)	(3)	(4)
CGI	−0.044*** (−2.72)	−0.020 (−1.33)	−0.041** (−2.44)	−0.024 (−1.58)
Govown	−0.019** (−2.03)	0.001 (0.07)	−0.017* (−1.86)	0.007 (0.74)
Forown	−0.008 (−0.43)	−0.006 (−0.28)	−0.015 (−0.78)	0.000 (0.00)
Top5	−0.011 (−0.90)	−0.023* (−1.93)	−0.011 (−0.92)	−0.029** (−2.57)
ROA	0.037 (0.80)	−0.099*** (−4.03)	−0.029 (−1.29)	−0.070* (−1.78)
MTB	0.008** (2.59)	0.035*** (2.83)	0.008*** (2.89)	0.044*** (3.98)
TL_TA	−0.004 (−0.30)	−0.023** (−2.16)	−0.011 (−0.78)	−0.039*** (−3.37)
ln_TA	0.000 (0.18)	0.001 (0.49)	0.000 (−0.06)	0.001 (0.81)
OCF_LTA	−0.030 (−1.14)	−0.056 (−1.65)	−0.018 (−0.68)	−0.063** (−2.11)
Age	−0.001 (−0.94)	−0.001 (−1.17)	0.000 (−0.35)	−0.002** (−2.01)
Big4	−0.012** (−2.03)	0.005 (0.92)	−0.008 (−1.41)	0.002 (0.31)
Loss	0.058*** (3.42)	0.031*** (4.32)	0.046*** (3.77)	0.030*** (3.79)
Sales_growth	0.005 (1.20)	0.012*** (3.66)	0.004 (0.94)	0.012*** (3.85)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
R^2	0.053	0.092	0.054	0.077
Observations	2898	2536	2709	2725

The table shows the regression results of corporate governance on earnings management based on different growth opportunities using the RE method. Standard errors are clustered at the firm level. A firm is considered to be high growth if its market-to-book or Tobin's Q is higher than the sample median, and vice versa. See Table 3 for definitions of variables. Figures in parentheses are the z-statistics. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

To test or conjecture, the sample is split into two subsamples of firms based on the sample median. Firms are classified into high growth opportunities (e.g., if *MTB* and *TobinQ* are higher than the sample median), and vice versa. Equation (5) is re-estimated using these subsamples separately and the results are reported in Table 11. Columns (1)–(3) present the results using subsamples of firms with high growth opportunities, while Columns (2)–(4) show the results using subsamples of firms with low growth opportunities.

The results show that the coefficients of *CGI* are negative and statistically significant for high growth firms, whereas they are insignificant for low growth firms. The findings suggest that the effect of corporate governance on earnings management is stronger in firms with more growth opportunities. This supports the argument that when information asymmetry is higher, corporate governance plays a more critical role in monitoring managerial misbehaviour. The finding also complements the literature that suggests the impact of corporate governance on firm outcomes depends on different types of firms (Arun et al., 2015). The result is consistent with Ali et al. (2018), who contend that corporate governance is more vital in firms with a high level of information asymmetry.

4.2.3. Signed discretionary accruals

In this section, we extend our study by examining the sign of abnormal accruals. Cheng et al. (2015) indicate that positive discretionary accruals reflect the level of income-increasing earnings management. Meanwhile, negative discretionary accruals reflect the degree of income-decreasing earnings management. Following Cheng et al. (2015), this study separates the earnings management variables into two subsamples: positive discretionary accruals and negative discretionary accruals and examines the impact of corporate governance on income-increasing and income-decreasing earnings management. Equation (5) is re-estimated using the two subsamples. Table 12 reports the results.

In Column (1), the dependent variable is positive discretionary accruals which demonstrate the level of income-increasing earnings management. The coefficient is significantly negative at the five percent level, suggesting that the firms with higher corporate governance quality have less tendency to manage their earnings upward. However, the results from Column (2) of Table 12 show that corporate governance does not play a significant role in limiting firms' income-decreasing earnings management.

4.2.4. Robustness check

In this section, further analyses are conducted to check the robustness of the main result. First, this study considers two alternative methods to measure earnings management, i.e. Jones model (1991) and performance-augmented discretionary accruals model of Kothari et al. (2005). These models are widely used in previous research on earnings management. The Jones model is similar to the modified Jones model with one exception. The difference between the change in revenue and the change in receivables is replaced by the change in revenue in Equation (3) to compute fitted values. Meanwhile, in the performance-augmented discretionary accruals model, Kothari et al. (2005) identify the discretionary portion of accruals by estimating the following model using the OLS regression for all firms and controlling for performance:

$$TAC_{ijt} / TA_{ijt-1} = \alpha_j \left[1 / TA_{ijt-1} \right] + \beta_{1j} \left[\left(\Delta REV_{ijt} - \Delta REC_{ijt} \right) / TA_{ijt-1} \right] + \beta_{2j} \left[PPE_{ijt} / TA_{ijt-1} \right] + \beta_{3j} \left[ROA_{ijt} / TA_{ijt-1} \right] + \varepsilon_{ijt} \quad (9)$$

Where TAC_{ijt} is the total accruals for firm i in industry j in year t, ΔREV_{ijt} is the change in revenue for firm i in industry j between year t-1 and year t, ΔREC_{ijt} is the change in receivables for firm i in industry j between year t-1 and year t, PPE_{ijt} is the level of gross property, plant, and equipment for firm i in industry j in year t, TA_{ijt-1} represents the total assets for firm i in industry j in year t-1, and ROA_{ijt} is the

Table 12
Signed discretionary accruals.

Dependent variable:	Positive DAC	Negative DAC
	(1)	(2)
CGI	−0.018** (−2.02)	0.002 (0.18)
Govown	0.03 (0.56)	0.022*** (4.10)
Forown	0.014 (1.41)	0.012 (1.05)
Top5	−0.011 (−1.46)	0.003 (0.53)
ROA	0.71*** (19.04)	0.239*** (3.38)
MTB	0.003 (1.34)	0.005*** (2.67)
TL_TA	−0.011* (−1.66)	−0.039*** (−4.76)
ln_TA	0.004*** (4.60)	0.006*** (5.40)
OCF_LTA	−0.749*** (−30.39)	−0.574*** (−21.10)
Age	−0.001*** (−2.79)	0 (0.75)
Big4	−0.009*** (−3.44)	−0.006* (−1.86)
Loss	0.008 (1.50)	−0.034*** (−3.30)
Sales_growth	−0.02 (−0.63)	−0.006*** (−2.61)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
R^2	0.731	0.606
Observations	2719	2715

The table shows the regression results using signed discretionary accruals as dependent variables. See Table 3 for definitions of variables. Column (1) shows results using positive discretionary accruals, and Column (2) presents the results using negative discretionary accrual. Figures in parentheses are the t-statistics. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 13

Alternative measures of earnings management.

Dependent variable:	|DAC_Jones|	|DAC_Kothari|
	(1)	(2)
CGI	−0.031*** (−2.66)	−0.037*** (−3.19)
Govown	−0.006 (−0.94)	−0.010 (−1.56)
Forown	0.006 (0.42)	−0.012 (−0.85)
Top5	−0.018** (−2.19)	−0.016* (−1.93)
ROA	−0.039** (−2.05)	−0.036* (−1.90)
MTB	0.011*** (5.13)	0.009*** (4.34)
TL_TA	−0.016* (−1.87)	−0.018** (−2.20)
ln_TA	0.000 (−0.23)	0.001 (0.87)
OCF_LTA	−0.021 (−1.11)	−0.021 (−1.05)
Age	−0.001 (−1.44)	−0.001 (−1.32)
Big4	−0.004 (−1.05)	−0.001 (−0.17)
Loss	0.035*** (5.28)	0.007 (1.20)
Sales_growth	0.007*** (3.32)	0.008*** (3.54)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
R^2	0.056	0.045
Observations	5434	5434

The table shows the regression results using alternative measures of earnings management. See Table 3 for definitions of variables. Column (1) shows results using Jones model to estimate discretionary accruals, and Column (2) presents the results using Kothari model. Figures in parentheses are the z-statistics. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 14

Alternative measures of total accruals: The balance sheet approach.

Dependent variable:	|DAC_mJones|	|DAC_Jones|	|DAC_Kothari|
	(1)	(2)	(3)
CGI	−0.069*** (−4.84)	−0.062*** (−4.44)	−0.065*** (−4.76)
Govown	−0.026*** (−3.30)	−0.021*** (−2.74)	−0.024*** (−3.27)
Forown	−0.030* (−1.80)	−0.024 (−1.52)	−0.026* (−1.71)
Top5	−0.015 (−1.46)	−0.013 (−1.36)	−0.011 (−1.21)
ROA	−0.077*** (−2.71)	−0.071*** (−2.63)	−0.070*** (−2.62)
MTB	0.013*** (5.00)	0.012*** (4.92)	0.012*** (4.74)
TL_TA	−0.015 (−1.50)	−0.013 (−1.32)	−0.011 (−1.18)
ln_TA	0.002 (1.57)	0.002 (1.37	0.002 (1.37)
OCF_LTA	−0.049*** (−2.73)	−0.036*** (−2.25)	−0.053*** (−3.27)
Age	−0.002*** (−2.68)	−0.002*** (−2.69)	−0.001** (−2.25)
Big4	−0.005 (−1.06)	−0.004 (−0.99)	−0.001 (−0.30)
Loss	0.005 (0.74)	0.004 (0.60)	−0.008 (−1.05)
Sales_growth	0.018*** (4.94)	0.015*** (4.47)	0.016*** (4.61)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
R^2	0.065	0.058	0.062
Observations	5434	5434	5434

The table shows the regression results using the balance sheet approach to calculate total accruals. See Table 3 for definitions of variables. Column (1) shows results using modified Jones model to estimate discretionary accruals, Column (2) presents the results using Jones model, and Column (3) demonstrates the results using Kothari model. Figures in parentheses are the z-statistics. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

return on assets for firm i in industry j in year t.

The residuals ε_{ijt} from the regressions are used as a proxy for discretionary earnings management. Equation (5) is re-estimated using the absolute value of discretionary accruals estimated using Jones and Kothari models and obtain similar results. The results are consequently not sensitive to the particular measure of accruals. Table 13 reports the results.

Second, this study uses an alternative approach to measure total accruals. Several studies (Gaio & Pinto, 2018; Park & Shin, 2004; Sáenz González & García-Meca, 2014; Xie et al., 2003) document the use of the balance sheet approach to estimate total accruals in Equation (1). The operating accruals are computed by subtracting the change in current liabilities, change in cash, and depreciation and amortisation from the changes in current assets and short-term debt. RE method is utilised to re-estimate Equation (5) with new values of discretionary accruals using the Jones, modified Jones, and Kothari models. The results reported in Table 14 show that *CGI* is negative and statistically significant at the one percent level in all models; thus, confirming the robustness of the main results.

Third, the existing literature suggests that firms can also manage earnings through real earnings manipulation which requires deviations from normal operational practices to manipulate accounting numbers, with direct consequences for firms' current and

future cash flows. The changes in business transactions could be disguised as normal activities which are hard to be detected. Therefore, this study follows previous research on real earnings management (Abad et al., 2018; Roychowdhury, 2006) and constructs three measures of real earnings management (abnormal cash flows, abnormal production costs, and abnormal discretionary expenses). Three models are employed to construct REM measures. The normal level of cash flows from operations is estimated using the following model:

$$CFO_t \big/ TA_{ijt-1} = \alpha_0 + \alpha_1(1 \big/ TA_{t-1}) + \beta_1 (Sales_t \big/ TA_{t-1}) + \beta_2[\Delta Sales_t \big/ TA_{t-1}] + \varepsilon_t \tag{10}$$

Where CFO_t is cash flow from operations in year t, TA_t represents total assets in year t, Sales and $\Delta Sales_t$ represent sales and change in sales in year t, respectively.

We employ the following model to calculate the normal level of production costs:

$$PROD_t \big/ TA_{ijt-1} = \alpha_0 + \alpha_1(1 \big/ TA_{t-1}) + \beta_1 (Sales_t \big/ TA_{t-1}) + \beta_2[\Delta Sales_t \big/ TA_{t-1}] + \beta_3[\Delta Sales_{t-1} \big/ TA_{t-1}] + \varepsilon_t \tag{11}$$

Where $PROD_t$ represents production costs defined as the sum of costs of goods sold plus the change in inventory in year t, and TA_{t-1} represents total assets in year $t-1$. Other variables have been defined previously.

To estimate the normal level of discretionary expenses, the following model is utilised:

$$DISPEX_t \big/ TA_{ijt-1} = \alpha_0 + \alpha_1(1 \big/ TA_{t-1}) + \beta_1 (Sales_t \big/ TA_{t-1}) + \varepsilon_t \tag{12}$$

Where $DISPEX_t$ represents discretionary expenses and in year t, and TA_{t-1} represents total assets in year $t-1$. Other variables have been described previously.

Following previous studies, models (10), (11), and (12) are estimated cross-sectionally for each year and industry[11] using all the data available in the period. This study requires at least ten firm-year observations per industry. For every firm-year, the residuals of the regressions (10), (11) and (12) demonstrate the abnormal cash flow from operations, the abnormal productions costs, and the abnormal discretionary expenses, respectively. Lower abnormal cash flows from operations *(ACFO)*, higher abnormal productions costs *(APROD)*, and lower abnormal discretionary expenses *(ADISPEX)* represent income-increasing real earnings management. Consistent with the literature, this study multiplies the residuals of models (10) and (12) by (−1), so that higher values of these variables signify greater increases of earnings. Following Abad et al. (2018) and Cheng et al. (2016), three aggregated measures of real earnings management *REM1, REM2,* and *COM-REM* are constructed to capture the total amount of real earnings management engaged by the firm. *REM1* is defined as *APROD + ADISPEX; REM2* is equal to *ACFO + ADISPEX*; and *COM-REM* is constructed as *ACFO + APROD + ADISPEX*. Higher values of *REM1, REM2,* and *COM-REM* indicate higher probability of real earnings management, in particular, firms engage in higher production costs and reducing discretionary expenses *(REM1),* in manipulating sales and lowering discretionary expenses *(REM2)*, and in all three activities *(COM-REM)*.

Equation (5) is re-estimated using the three real earnings management measures as dependent variables. Table 15 reports the results.

The results show that *CGI* is negative and statistically significant at the five and ten percent levels in all models; thus, confirming the robustness of the main results. The results suggest that better-governed firms experience a lower level of real earnings management. The extent of real earnings management decreases with corporate governance quality.

5. Conclusion

The primary objective of this study is to examine, for non-financial listed firms in Vietnam from 2008 to 2018, the impact of corporate governance on earnings management, measured by the absolute value of discretionary accruals, signed discretionary accruals, and real earnings management. After controlling for firm-specific characteristics, we find that firms with higher corporate governance index are associated with lower earnings management. Results remain unchanged with the use of alternative measures of earnings management and alternative model specifications, which are used to allow for possible endogeneity biases. The findings from this study align with prior studies suggesting that corporate governance reduces agency and information costs. Considering the moral hazard, managers are more likely to act in their personal interests at the expense of stakeholders, in the absence of efficient corporate governance mechanisms. Reinforcement of corporate governance monitors managerial opportunism (Ali et al., 2018) and constrains earnings management activities (Liu & Lu, 2007; Shen & Chih, 2007). Our findings further suggest that the effectiveness of corporate governance's monitoring role is subject to ownership structure and firms' growth opportunities. The negative relationship is found to be significant only in non-SOEs, firms with high foreign ownership and low concentrated ownership, and high growth firms.

This study is relevant to a wide range of interest groups for the following reasons. The findings indicate that a well-governed business has a safety net in place to protect minority shareholders. Specifically, investment communities (e.g. fund managers) may benefit from redirecting investment toward stocks with good corporate governance practices and hence, better information quality. Firms acknowledge the benefits of compliance with the law and regulations; thus, they can identify what can be done to achieve good governance to deter misconduct and ensure that managers act in the best interests of the shareholders. Creditors can also view a

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[11] According to Hoang et al. (2016a), there are no generally accepted industry classifications for listed firms in Vietnam. So, this study follows Vietstock – the oldest financial data provider in Vietnam to use two-digit NAICS codes to classify firms operating in the same industry.

Table 15

Corporate governance and real earnings management.

Dependent variable:	REM1 (1)	REM2 (2)	COM-REM (3)
CGI	−0.072** (−2.43)	−0.018* (−1.74)	−0.074** (−2.45)
Govown	−0.1*** (−6.32)	−0.021*** (−3.85)	−0.098*** (−6.04)
Forown	−0.234*** (−8.01)	−0.123*** (−12.04)	−0.24*** (−8.04)
Top5	0.05 (0.27)	−0.03 (−0.52)	0.005 (0.26)
ROA	−0.061** (−2.06)	0.037*** (3.43)	−0.051* (−1.67)
MTB	−0.042*** (−9.18)	−0.02*** (−12.81)	−0.044*** (−9.53)
TL_TA	0.15*** (8.75)	0.019*** (3.14)	0.165*** (9.44)
ln_TA	0.015*** (5.25)	0.012*** (12.31)	0.018*** (6.09)
OCF_LTA	−0.448*** (−15.19)	−0.956*** (−94.75)	−1.34*** (−44.41)
Age	0.001 (1.00)	−0.001 (−1.19)	0.002 (1.49)
Big4	−0.011 (−1.15)	−0.014*** (−4.30)	−0.012 (−1.25)
Loss	−0.036** (−2.14)	−0.009 (−1.46)	−0.04** (−2.38)
Sales_growth	−0.004 (−0.75)	0.001 (0.72)	−0.007 (−1.22)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
R^2	0.159	0.688	0.402
Observations	4639	5104	4639

The table shows the regression results using the RE method. See Table 3 for definitions of variables. Column (1) shows results using REM1 to estimate real earnings management, Column (2) presents the results using REM2, and Column (3) demonstrates the results using COM-REM. Figures in parentheses are the t-statistics. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

deficient governance structure as a red flag and make their debt covenants more stringent. Our findings suggest policy implications for government/industry regulators, especially when they review the ramification of Corporate Governance Codes in Vietnam. The same applies in most emerging market economy nations (e.g. Laos and Cambodia) with a low level of investor protection.

This paper is, however, subject to limitations. Due to lack of data availability, the composite governance index constructed in this study manages to capture two dimensions of governance attributes including the board of directors and supervisory board. Future studies can explore the relationship between corporate governance and earnings management in greater depth by including other governance dimensions that may affect the nexus, such as the pyramidal ownership structure, family ownership ratio, and different types of institutional ownership of firms. At the same time, the limited data narrows down the scope of this study in a way that we can only construct the composite governance index in alignment to the quantifiable (measurable) requirements of the corporate governance code of best practices. While we acknowledge data limitation in our paper, future research can use a more comprehensive dataset to construct a new corporate governance index that can cover qualitative data, such as stakeholder relations and control environment.

CRediT author statement

Acknowledgment

Appendix A. (all figures present original values in binary, discrete or continuous forms.)

Panel A: Pair-wise correlation of 13 governance attributes												
Variables	Duality	Nexpt	Bsize	SB	NexSBpt	ForB	Bexp	Bedupt	BlockB	FeoB	Ch_tenure	Nex_ch
Nexpt	**0.340**											
Bsize	0.023	**0.074**										
SB	**0.055**	−0.007	**0.176**									

(*continued*)

Panel A: Pair-wise correlation of 13 governance attributes

Variables	Duality	Nexpt	Bsize	SB	NexSBpt	ForB	Bexp	Bedupt	BlockB	FeoB	Ch_tenure	Nex_ch
NexSBpt	**−0.076**	**−0.096**	0.029	**0.103**								
ForB	−0.017	**0.074**	**0.306**	−0.001	−0.010							
Bexp	0.009	**0.072**	**0.183**	−0.028	**−0.189**	**0.482**						
Bedupt	**0.086**	**0.072**	**0.091**	0.000	**−0.074**	0.006	**0.052**					
BlockB	**−0.153**	**−0.106**	**0.066**	−0.033	**−0.075**	0.032	0.027	**−0.055**				
FeoB	**−0.075**	0.033	**0.204**	0.015	**−0.038**	0.062	0.047	0.020	**0.103**			
Ch_tenure	**−0.156**	**−0.091**	**0.112**	−0.036	**−0.167**	**0.129**	**0.123**	0.057	**0.262**	0.058		
Nex_ch	**0.960**	**0.370**	0.011	**0.058**	**−0.073**	−0.007	0.015	**0.091**	**−0.151**	**−0.084**	**−0.151**	
SBexp	−0.031	−0.002	0.023	0.016	−0.013	−0.005	0.007	**0.078**	0.041	0.063	0.009	**−0.035**

Panel B: Descriptive Statistics of 13 governance attributes

Variables	Obs	Mean	Std. Dev.	p1	p25	p75	p99
Duality	5434	.317	.465	0	0	1	1
Nexpt	5434	.640	.181	.200	.571	.800	1
Bsize	5434	5.403	1.091	3	5	5	9
SB	5434	2.981	.475	1	3	3	5
NexSBpt	5434	.770	.417	0	1	1	1
ForB	5434	.220	.851	0	0	0	4
Bexp	5434	.073	.454	0	0	0	2
Bedupt	5434	.171	.208	0	0	.250	.800
BlockB	5434	.553	.867	0	0	1	4
FeoB	5434	.747	.900	0	0	1	3
Ch tenure	5430	4.268	2.747	1	2	6	12
Nex ch	5434	.665	.472	0	0	1	1
SBexp	5434	.024	.153	0	0	0	1

Panel C: Year-wise statistics of 13 governance attributes

Governance indicators	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Duality	.614	.577	.591	.64	.667	.686	.723	.749	.738	.765
Nexpt	.619	.611	.609	.61	.631	.639	.651	.662	.671	.676
Bsize	5.454	5.454	5.389	5.388	5.432	5.427	5.424	5.39	5.337	5.381
SB	2.932	2.992	2.993	3.01	3.023	3.019	3.014	2.972	2.951	2.89
NexSBpt	.975	.993	.988	.994	.999	.998	.996	.992	.009	.008
ForB	.232	.224	.176	.167	.183	.215	.235	.241	.241	.292
Bexp	.017	.013	.013	.011	.017	.019	.019	.023	.241	.292
Bedupt	.127	.148	.154	.164	.166	.169	.174	.178	.2	.202
BlockB	.276	.304	.455	.522	.544	.563	.604	.658	.674	.69
FeoB	.625	.686	.717	.714	.725	.741	.757	.781	.796	.838
Ch tenure	2.645	2.936	3.256	3.816	4.231	4.548	4.725	4.874	5.083	5.204
Nex ch	.597	.564	.577	.627	.648	.669	.704	.725	.72	.742
SBexp	.014	.013	.02	.025	.018	.024	.026	.034	.028	.028

Appendix B. Principal Component Analysis

Panel A: Percentage of data variance explained by each component

Component	Eigenvalue	% Variance explained	Cumulative variance
Comp1	2.323	0.179	0.179
Comp2	1.860	0.143	0.322
Comp3	1.282	0.099	0.420
Comp4	1.165	0.090	0.510
Comp5	1.051	0.081	0.591
Comp6	0.972	0.075	0.665
Comp7	0.924	0.071	0.737
Comp8	0.844	0.065	0.801
Comp9	0.742	0.057	0.859
Comp10	0.692	0.053	0.912
Comp11	0.642	0.049	0.961
Comp12	0.467	0.036	0.997

(*continued*)

Panel A: Percentage of data variance explained by each component			
Component	Eigenvalue	% Variance explained	Cumulative variance
Comp13	0.037	0.003	1.000

Panel B: Loading of predictor variables on each component					
Variable	Comp1	Comp2	Comp3	Comp4	Comp5
Duality	0.609	0.030	−0.064	0.086	0.172
Nexpt	0.368	0.144	−0.042	0.033	−0.059
Bsize	0.005	0.433	0.404	0.190	0.093
SB	0.056	0.034	0.519	0.249	0.229
NexSBpt	−0.057	−0.220	0.573	−0.071	0.041
ForB	−0.014	**0.528**	0.172	−0.373	−0.051
Bexp	0.011	**0.518**	−0.053	−0.378	−0.148
Bedupt	0.103	0.137	−0.084	0.315	−0.545
BlockB	−0.221	0.171	−0.252	0.324	0.472
FeoB	−0.088	0.227	0.140	**0.423**	0.026
Ch_tenure	−0.205	0.301	−0.325	0.196	0.260
Nex_ch	0.614	0.034	−0.069	0.077	0.169
SBexp	−0.036	0.054	0.009	**0.422**	−0.513

Panel C: Regression model with principal components	
Dependent variable	|DAC|
Comp1	−.000 (−0.03)
Comp2	−.005***(-3.95)
Comp3	.001 (0.68)
Comp4	−.003*** (−2.92)
Comp5	−.000 (−0.23)
Control variables	Yes
Year fixed effects	Yes
Industry fixed effects	Yes
Constant	0.098*** (5.25)
R^2	0.062
Observations	5430

Panel D: Regression model with dominant variables in significant principal components	
ForB	0 (−0.29)
Bexp	−.004 (1.54)
FeoB	−.003* (−1.95)
SBexp	.001 (0.14)
Control variables	Yes
Year fixed effects	Yes
Industry fixed effects	Yes
Constant	0.117*** (5.43)
R^2	0.059
Observations	5434

This table demonstrates the PCA results. See Table 3 for definitions of variables. Panel A reports the percentage of data variance explained by each component. Panel B presents the loading of predictor variables on each component. Panel C reports the results of the regression model with principal components. Panel D shows the results of the regression model with dominant variables in significant principal components. Figures in parentheses are t-statistics. Superscripts *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Appendix C. Key summaries of the existing literature constructing the corporate governance index

Authors (year)	Research question	Sample	Main findings	Corporate Governance Index
Shen and Chih (2007)	How corporate governance affects the relationship between firms' financial ratios and earnings management.	204 firms across 9 emerging markets (Hong Kong, India, Indonesia, Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand) in April 2001 and February 2002.	Firms with good corporate governance tend to conduct less earnings management. This effect depends upon firm characteristics such size, leverage, growth opportunities, and also on country characteristics including anti-director rights	The study adopted readily available corporate governance index constructed by Credit Lyonnais Securities Asia. The questions in the CLSA report cover seven broad categories: management discipline (DISC), transparency (TRAN), independence (INDP),

(*continued*)

Authors (year)	Research question	Sample	Main findings	Corporate Governance Index
				accountability (ACCT), responsibility (RESP), fairness (FAIR) and social awareness (SOCI).
Abbadi et al. (2016)	To investigate the effect of corporate governance quality on earnings management	121 Industrial and service firms from Jordan for the period from 2009 to 2013.	Earnings management is affected negatively by the overall governance quality and its sub-categories including board of director, board meeting, audit, and nomination and compensation committee.	The governance index is classified into four categories with a total of 10 standards. All the standards are required by corporate governance code for shareholding companies listed on the ASE under "compliance or explain" approach except standards 9 which is voluntarily adopted. The governance standards that range from 1 to 10 to indicate the degree of compliance with 10 governance standards: Board of directors, board meetings, audit, nominations and compensations.
Bekiris and Doukakis (2011)	To examine the association between corporate governance and accruals earnings management	427 firms from three European countries (185 Greece, 155 Italy, and 87 Spain) for the year 2008.	The paper finds an inverse relationship between corporate governance and earnings management. Additional tests suggest that the negative relationship holds for large and middle capitalization firms but not for the small capitalization sample. In addition, corporate governance provisions limit upwards but not downwards earnings management.	Corporate governance index is composed of 55 individual indicators collected from the annual reports and websites of companies on five dimensions: board of directors, audit, remuneration, shareholder rights and transparency.

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