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Corporate performance modeling through disclosure quality at the level of developing countries in Southeast Asia

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ABSTRACT

The disclosure quality (DQ) of financial statements in Southeast Asian firms remains poorly understood, with its impact on performance yet to be empirically determined. Our study thus investigates the influence of DQ on corporate performance (CP) among listed firms, examining the moderating effects of managerial myopia (MM) and corporate governance (CG). Employing quantitative methods and data from Thomson Reuters DataStream, we analyze a ten-year dataset of firms listed on stock exchanges in six developing Southeast Asian nations during the period 2012–2021 using the generalized method of moments (GMM) estimation. Our findings support a positive effect of DQ on CP, consistent with agency theory, while also highlighting the moderating roles of MM and CG. We advocate for constraints on MM and strengthened CG mechanisms to enhance the effect of DQ on CP. Our study contributes new insights rooted in agency theory, providing comprehensive explanations for the effects of MM and CG on the DQ-CP nexus. Investors can leverage these insights by utilizing DQ and CG as forecasting indicators for future CP. Furthermore, future research could broaden the scope by including additional developing nations to yield more comprehensive findings.

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1. Introduction

In today's context of economic integration and digital technology, financial reporting is increasingly shifting toward comprehensive digitalization, accompanied by the blurring of human roles (Abu Afifa et al., 2024b). The current imperative is that humans must master technology and evaluate the disclosure quality (DQ) of reports prepared based on technology (Nguyen et al., 2023). Additionally, quantifying the impact mechanism of DQ on corporate performance (CP) is necessary to provide a more

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comprehensive perspective for business leaders (Saleh et al., 2023b). However, there are no more empirical studies addressing both of these issues, especially in developing regions. Several previous studies have identified the influence of fiscal DQ on fiscal performance indicators, indicating a notably favorable nexus. Most of these studies have determined the DQ score or index, which is calculated according to specific models based on financial information (Abu Afifa et al., 2023a, 2024a; Qizam, 2021; Temiz, 2021; Wu et al., 2011). Particularly, Jiao (2011) uses the yearly Association for Investment Management and Research corporate disclosure rankings as a proxy to measure the DQ score. However, the use of alternative types of disclosure ratios or business administration ratios can result in negative consequences. Another stream of research focuses on the influence of DQ on specific aspects of performance. Accordingly, some studies pay attention to the DQ related to the environment (Alipour et al., 2019; Iatridis, 2013), all demonstrating its positive impact on operational performance. Particularly, Khan et al., (2020) shed light on the DQ of Southeast Asian nations. In the era of globalization, every firm seeks finalized data to save time and money. When the DQ of financial statements is not transparent and does not provide sufficient information to outside investors, Southeast Asian firms remain uncertain about the firm's risks, future growth prospects, and equity model.

Furthermore, several scholars indicate a favorable influence of non-fiscal DQ (Gao et al., 2016) or intellectual capital DQ (Vitolla et al., 2019) on corporate performance (CP). The key restriction has been that the scholars only pay attention to one particular feature and may not represent the DQ-CP nexus in general. Therefore, the direct and indirect effects of DQ on CP are still not clearly verified in the literature, especially the role of managerial myopia (MM) and corporate governance (CG). Additionally, Kijkasiwat et al. (2022) show that firms' access to finance and social capital significantly influence CP improvement in the Southeast Asian context. Besides, there is an intermediary role in the financial access of enterprises between the linkage of social capital and the improvement of CP. However, limited studies have been performed in academia to examine the factors that may influence and improve CP in the context of Southeast Asian countries.

In the past, MM has been studied for decades, focusing on research and development (R&D) costs. People tend to see myopic behavior as managerial opportunism (Almasarwah et al., 2021; Saleh et al., 2023a). However, there is a lack of previous research that examines whether MM might happen after controlling conflict in the firms, where their managers act for the benefit of the current shareholder by improving DQ. Previously, Bhojraj and Libby (2005) considered the influence of a shift in disclosure frequency on MM and identified MM as the demand to reach a greater contemporary stock price. Recently, Kolasinski and Yang (2018) considered MM as the use of negative net present value projects to increase income in the current period. Up to now, the effect of MM on CP has been reported in previous studies with mixed results. Fahlenbrach and Stulz (2011) found no evidence that leader incentives to MM influenced CP during crises, while Erel et al. (2014) concluded that leader impetus was not related to bank keeping of noxious collateralized stocks. In Southeast Asian countries, it could be valuable to consider whether the MM has been an outcome of institutional circumstances (Pangarkar, 2007). For example, the

segregation between owners and headers can be less prominent in Singapore because of the reduced presence of family-controlled and government-linked firms due to the likelihood of MM.

With CG, some authors argue that CP and CG are concomitantly identified by invisible corporate-distinctive factors and that shifts in governance are specified by earlier and current features of the firm (Hamdallah et al., 2021; Saleh et al., 2023a; Wintoki et al., 2012). Furthermore, Coles et al. (2012) imitate CP-maximizing corporates with endogenous proprietorship structures and find that the CG mechanism is an important factor in the firm. Therefore, effective corporate governance mechanisms will enhance the communal picture of a firm and its performance (Almasarwah et al., 2021; Iatridis, 2013). Effective corporate governance practices in Southeast Asian countries depend on security management, corporate law, the corporate governance environment, bankruptcy law, and other accounting and auditing standards (Bhasin, 2009). Most of these economies have been proactively engaged in enhancing and revising the statutory framework as well as transparency and corporate governance disclosure over the past few years (Khan et al., 2020; Saleh et al., 2022). The environment and corporate governance practices of Southeast Asian countries have global significance, so we start focusing on this area.

Thus, it has been necessary to carry out empirical research to evaluate the complex impact mechanisms of important components (e.g., DQ, CG, and MM) on CP in the case of Southeast Asian countries representing developing regions. The objectives of the paper aim to discover the influence of DQ on the CP of listed firms in developing Southeast Asian countries. The authors also discover the moderating effect of MM and CG in these circumstances. The study's sample contains a ten-year data set of firms listed on the stock exchange of six developing Southeast Asian nations (Indonesia, Thailand, Vietnam, Singapore, Malaysia, and the Philippines) during the period 2012–2021. The results verify that there has been a favorable and notable effect of DQ on CP, which is appropriate to agency theory. Moreover, MM indicates a negative moderator role in the DQ-CP nexus in developing Southeast Asian countries. Additionally, CG positively moderates the DQ-CP nexus. In summary, the goal of the paper has been to confirm the complex mechanism of action between DQ and CP through MM and CG. The problem has received a lot of research attention (e.g., Minh et al., 2023), but not to the right extent. Furthermore, in the current dynamic context of the world economy, finding this mechanism partly helps firms improve their CP as well as ensure sustainable development, especially firms in the ASEAN region, where sustainability has not been given due attention (Adeel-Farooq et al., 2021).

The study presents several scholarly and experimental benefits, as follows: Firstly, earlier papers primarily focused on the direct influences of DQ on CP rather than considering other factors. Therefore, this study verifies the direct impact of DQ on CP by examining the moderating impact of MM. Secondly, the paper aims to elucidate how CG affects the DQ-CP nexus, which previous studies have left unexplored. Specifically, firms with effective CG mechanisms exhibit a stronger DQ-CP nexus (Afifa et al., 2021). Thirdly, within this research context, the paper's findings contribute to the body of literature by providing contemporary explanations linked to agency

theory. Finally, the results of the paper offer decision-makers more detailed insights into the impact of MM and CG on the DQ-CP relationship. Hence, current and prospective investors can utilize these insights to inform their decisions by considering DQ and CG as factors for forecasting future CP. Additionally, policymakers can use the results to establish guidelines that may enhance CP levels by addressing the role of MM and CG in DQ.

The rest of this paper includes the following five sections: [Section 2](#) is a literature review and hypothesis development. [Section 3](#) is the research methodology. The next sections are the research results and discussions. Finally, there are the conclusions as well as the shortcomings of the paper.

2. Literature overview and hypothesis

Agency theory focuses on examining information asymmetries between owners and managers (Afifa et al., 2021; Khan et al., 2020; Tran et al., 2023). In line with agency theory, an effective system of CG is necessary for more transparent disclosure of information about the firm (Abu Afifa et al., 2024a). Accordingly, shareholders would need to establish mechanisms to minimize opportunism and information asymmetry (Abu Afifa & Saadeh, 2023) while ensuring that shareholder wealth is maximized (Toumeh et al., 2021). Some CG mechanisms will monitor the decisions and actions of managers and will limit the possibility of earnings manipulation (Saleh et al., 2022). In addition, leaders can use MM activities to decrease uncertainty in the firm's operations (Alessandri & Pattit, 2014). The decisions of MM managers resemble a scenario in which returns on R&D expenditure are undetermined, but R&D cuts may improve short-term income (Cheng, 2004). Last but not least, agency theory has been the foundation for considering the influence of DQ on performance (Alipour et al., 2019). It can be seen that earlier scholars have given an overall picture of the application of agency theory to scrutinize the influence of components on CP. Therefore, the paper has also been based on agency theory to evaluate the influence of DQ on CP as well as the role of MM and CG on the DQ-CP nexus.

Currently, the significance of DQ has been more qualitative than accounting quality, which is primarily correlative to value relevance (Abu Afifa et al., 2023b), while DQ includes compliance with International Financial Reporting Standards (IFRS) and the quality of non-financial data disclosed in an enterprise's annual report (Hla et al., 2021). In fact, the term DQ is very vague and has no specific definition. However, DQ is related to the effectiveness of the data for speculators and its relevance to value (Badu & Appiah, 2018). High-quality financial disclosure provides superior information to decrease information asymmetries and limit inter-agency conflicts through improved external oversight (Abu Afifa & Saadeh, 2023). Besides, the establishment of reporting not only focuses on how a firm discloses information but also on the ways in which firms interact so that the impacts of reporting may be understood more completely (Qiu et al., 2016; Rezaee & Tuo, 2017). Therefore, DQ is not only identified by the level of quality of fiscal reporting but also must examine its adverse competing influence on the profitability of businesses (Qizam, 2021). However, determining and calculating DQ is relatively difficult and inconsistent among scholars, and

it depends on the context of each particular study. In this study, we try to propose a DQ calculation for some nations in Southeast Asia where the application of IFRS has not been uniform.

Since the introduction of IFRS, the accrual rate has also been employed to enhance the measurement of DQ (Richardson & Tuna, 2020). Furthermore, the audit fee ratio is also used as a determinant of DQ (Shakhatreh et al., 2020), while Lantto & Shalstrom (2009) use crucial fiscal ratios as proxies to quantify DQ. However, DQ and IFRS compliance have been found to have an influence on crucial fiscal ratios (Neel, 2017). Therefore, IFRS compliance is possible and likely to become a proxy for DQ (Hla et al., 2021). From another perspective, only nations that signify compliance with IFRS will have capital market advantages. In contemporary times, there has been research that has documented that higher-quality financial reporting also lowers capital expenditures (Habib et al., 2019) and is more positively related to performance. Additionally, Limijaya (2017) analyzed the application of IFRS in Southeast Asian countries, particularly Indonesia. The research indicates that several aspects need to be considered during IFRS implementation. The paper's results show that the quality of financial statements depends on standards, which is one of the characteristics of quality development.

According to Jiao (2011), high DQ can enhance the understanding of market participants about the nature of firms' business activities, which partially relieves the short-term pressure on the equity market. This argument implies an unfavorable nexus between the DQ and MM behaviors of managers by comparing firms' R&D intensity, focusing on two streams. One is a management myopic who believes that strain from more frequent financial disclosures can lead firm leaders to increase short-term income by decreasing R&D expenditures (Cheng, 2004; Dikolli et al., 2009). Others have to do with the external pressures of institutional investing, including a buffer zone that allows business leaders to pay attention to long-term income (David et al., 2001) and positively supports a nexus between organizational proprietorship and firm R&D expenditures (Jiang et al., 2013). Besides, it can be seen that their preferences influence their views on R&D investment through risk aversion rather than MM (Li et al., 2021b).

Definitions of CG are very broad and are inclined into two categorizations, comprising a set of behavioral patterns and normative frameworks (Claessens & Yurtoglu, 2013). Furthermore, effective CG mechanisms are often significantly associated with DQ as managers decide on the granularity and relevance of reported financial information. Recently, studies have shown that CG has an impact on aspects of disclosure such as the levels of voluntary disclosure (Ntim et al., 2017), environmental disclosure (Almaqtari et al., 2020), and especially the disclosure-performance nexus (Solikhah & Maulina, 2021). Although there is a close relationship between DQ, MM, CG, and CP, there has been a lack of papers considering the nexus of them in the same empirical model, and our research will fill this gap in the Southeast Asian context.

Agency theory has been correlative to discovering a mechanism by which the less informed owners can have a better advantage (e.g., more CP) from the efforts of the more informed and differentiated interest representatives (e.g., high DQ). In fact, information asymmetry makes financial statements unreliable (Abu Afifa & Saadeh,

2023). At that time, DQ will impact the users of the fiscal reporting data to assess the performance of the firm. Thus, DQ has been significant to the progress of monitoring the operations of the representatives so that the business may operate better and ensure the interests of the owners (e.g., shareholders). Furthermore, earlier studies show a substantial positive nexus between financial DQ and CP indicators (Jiao, 2011; Qizam, 2021; Temiz, 2021; Wu et al., 2011). In addition, specific aspects such as the quality of environmental disclosure (Alipour et al., 2019; Iatridis, 2013), the quality of non-fiscal reporting (Gao et al., 2016), or the quality of intellectual capital disclosures (Vitolla et al., 2019) all show a positive impact on CP. More specifically, a number of studies confirm the need for enhanced disclosure of information, arguing that it promotes transparency and is a major way to govern partnerships in the circumstances of capital markets (Muhamad et al., 2009). Accordingly, a high disclosure ratio improves the ability of related parties to make well-informed decisions. This has been one of the most advantageous tools for investor safety, raising capital, and sustaining confidence in capital markets. Therefore, potential related parties and investors ask for accurate, intact, and comparable disclosure in order to make wise choices. Ignorance or lack of perspicuity lessens the capability of active markets and increases the expense of capital (Fung, 2014). Thus, based on agency theory and earlier papers, the authors hypothesize that:

H₁: The nexus between disclosure quality and corporate performance is substantially positive.

As mentioned above, agency theory supplies a structure that links reporting behavior with CG. According to this theory, effective CG not only enhances the strength of internal control systems in the firm, but it also provides in-depth monitoring to minimize opportunistic behaviors and information asymmetries (Alipour et al., 2019). Scholars show that information asymmetry reduces with better DQ (Abu Afifa et al., 2023a) and CG boosts data transparency and quality, thus alleviating authority issues between managers and related parties (Afifa et al., 2021; Gao et al., 2016). Consequently, CP increases with more information transparency, and there is convincing experimental evidence for these effects based on many aspects of CG. Some experimental research has consistently documented that independent board members report more data for greater accountability (Alipour et al., 2019). Specifically, these board members have no individual return, thus represent shareholders, and exhibit a bigger propensity toward data transparency. Therefore, CP is expected to improve with better DQ, and this relationship can be reinforced with an effective CG mechanism. In other words, an effective CG mechanism (reducing agent manipulation) improves the DQ-CP nexus (increasing employer benefits), and this effect is consistent with agency theory. More specifically, with high CG, firms can increase disclosure scrutiny to limit omitted items (e.g., increase DQ), which, in turn, enhances communication to stakeholders (e.g., increased CP). On the contrary, if firms have low CG, this check is limited by resource limitations, leading to a reduction in both DQ and CP. Thus, H_2 is proposed as follows:

H₂: The nexus between disclosure quality and corporate performance is positive, with higher corporate governance.

Based on agency theory, managers can make operations to lessen uncertainty in the CP in order to restrict the threat to leaders' wealth (Alessandri & Pattit, 2014). Accordingly, the decisions of MM managers resemble a scenario in which returns on R&D expenditures are dubious, but R&D cuts may increase short-term income. CP affects leadership indemnification and task security (Cheng, 2004), causing MM behavior. Investing in R&D is a tactical choice that can be formed by agency issues, in which stakeholders encourage R&D expenditures with the expectation that it will improve a firm's long-term CP (Luo et al., 2022). Additionally, high DQ can enhance the understanding of market participants about the nature of firms' business activities (Jiao, 2011), so there is a negative nexus between DQ and the MM behavior of managers. Thus, according to agency theory, it can be seen that decreasing MM (reducing agent manipulation) will increase the effect of DQ enhancement on CP (increasing benefits for the owner). Therefore, we consider MM to have a moderate effect on the DQ-CP nexus in this study. More specifically, with high MM, firms cannot strengthen their inspection of information disclosure to limit omitted items due to the impact of managers' MM behavior. This leads to a decrease in DQ and, in turn, a decrease in signal transmission to the stakeholder (e.g., a decrease in CP). On the contrary, if firms have low MM, this problem is limited because it limits the MM behavior of managers, partly leading to increased DQ and CP. Finally, H_3 is proposed as follows:

H_3 : The nexus between disclosure quality and corporate performance is negative, with higher managerial myopia.

3. Research methodology

This study deals with the effect of DQ on the CP of listed firms as well as the moderating effects of MM and CG in this context. It shows actual proof from Southeast Asian circumstances. In terms of analytical methods, we use a combination of univariate analysis methods (unit root test) and multivariate regression analysis (original least squares, fixed effects, and random effects), and especially the two-step generalized method of moments for panel data. The population and sample, variables' measurement, and data analysis steps are explained in depth in the following subsections.

3.1. Population and sample

We had chosen the research circumstances in developing regions for the below reasons: First of all, there had been local laws that were believed to play a notable role in developing regions as well as emerging nations (Claessens & Yurtoglu, 2013), and they were closely related to CG, especially the increased toxicity established by the board of directors. This increase was essential in the above nations (Jizi et al., 2014) because external CG, legitimate structures, and firm management mechanisms were rather lacking. Furthermore, board independence was crucial in developing and emerging nations with tenuous inner surveillance mechanisms (Claessens & Yurtoglu, 2013; Rezaee & Tuo, 2017). Secondly, the current understanding of renewal (i.e., enhancing DQ) as well as its economic influence (i.e., enhancing CP) has been limited when it comes to developing regions. The majority of orthodox economists tended to argue that open-mindedness

and approachability to foreign technology were all problems in enhancing the productiveness of firms in these nations. In this context, Wadho and Chaudhry (2018) suggested that mostly lacking expertise might be featured in the finite accommodation of specific firm-level information on renewal procedures.

In particular, Rosenbusch et al. (2011) indicated that the Asian region had more potential to demonstrate a favorable effect of innovation on CP, given its traditional environment characterized by collectivism, which supports community interactivity and collaborative behavior conducive to innovation. In the developing regions of Asia, governments have been actively promoting innovation as a key driver of economic development (Azeem et al., 2021). Therefore, selecting the pattern of Asia's developing region (e.g., ASEAN) could help address the literature gap. According to the Asian Development Bank (ADB)¹, ASEAN exhibited average GDP growth and inflation rates during the intervals of 2018–2020. Consequently, we chose six developing Southeast Asian nations (Indonesia, Thailand, Vietnam, Singapore, Malaysia, and the Philippines) as our research context.

We used the dataset of firms listed on the stock exchanges of Indonesia, Thailand, Vietnam, Singapore, Malaysia, and the Philippines during the interval from 2012 to 2021 for our investigation. The authors selected the interval due to the COVID-19 pandemic that was affecting In particular, the 2012–2018 period represented a relatively stable economic time before a pandemic had arisen. The 2019 year marked the beginning of the pandemic, while the 2020–2021 years were the peak of the epidemic in almost every country. Several studies showing that this epidemic has severely affected CP were reported worldwide (Hu & Zhang, 2021), such as in Europe (Mirza et al., 2023) and Asia (Liu et al., 2021; Shen et al., 2020). Therefore, the authors aimed to evaluate the hypotheses during the interval to supplement their understanding of the CP literature. Correspondingly, chosen firms must have been listed at least once by 2012 and must be located in ASEAN. Besides, according to Abdullah and Tursoy (2021), we excluded financial institutions from the research sample because of different types of financial activities and policies.

Consequently, the authors ultimately had a panel data set comprising 1,810 firm-year observations (181 firms with ten-year information). Table 1 shows the classification of targeted firms by sector. The sector classification for the objective firms based on the Industry Classification Benchmark (ICB) standard was industry (31.49%), information technology (12.71%), pharmaceuticals and health (13.81%), consumer services (18.23%), consumer goods (12.71%), and community utilities (11.05%). The final panel dataset was downloaded from the Thomson Reuters DataStream database, and additional data had been gathered from the website <https://www.investing.com/>.

Table 1. Classification by sector.

ICB standard	Indonesia	Thailand	Vietnam	Singapore	Malaysia	Philippines	Total
Industry	8	10	9	7	12	11	57
Information technology	4	3	5	3	4	4	23
Pharmaceutical and health	3	4	4	4	5	5	25
Consumer services	5	6	4	5	7	6	33
Consumer goods	4	4	3	2	5	5	23
Community utilities	2	3	3	4	4	4	20
Total	26	30	28	25	37	35	181

Source: Created by the authors.

Specifically, we collected 10 years of data on 250 firms. We then filtered and eliminated 54 firms listed in the financial sector and 15 firms with some missing CG or MM information.

3.2. Variables measurement

According to Andersen et al. (2016), CP is usually measured in two common ways: by measuring primary data as well as secondary data. In which, measuring CP using secondary data was highly appreciated because it did not depend on judgments and, more importantly, focused on a quantitative perspective. Moreover, it was relatively easy to find and access secondary data reflecting the CP of listed firms through data-providing websites because this was public information. Therefore, we measured CP using secondary data. Previous studies used different secondary measures of performance, namely return on assets (ROA) (Miah, 2021; Shoaib & Siddiqui, 2020; Temiz, 2021), return on equity (ROE) (Miah, 2021; Saeedi & Mahmoodi, 2011), Tobin's Q (Dakhlallah et al., 2020; Meshram & Arora, 2021), as well as free cash flow (Richardson, 2006). Although Tobin's Q and ROA were suitable for measuring CP, Tobin's Q did not accurately describe depreciation (Demsetz & Villalonga, 2001) and was unreservedly independent of individual impact (Shoaib & Siddiqui, 2020). Meanwhile, ROA was a correct appreciation of employing effectiveness since it supplied data on the range to which the firm was effective in utilizing its resources as well as reduced the sizable variation in the influences of the firm (Shoaib & Siddiqui, 2020). Therefore, we measured CP based on ROA, which was net income divided by total assets.

Some common DQ measures used by previous studies include the level of separation of accounting information *via* the omitted items (Chen et al., 2015; Li et al., 2021a), error absolute forecast (Hlel et al., 2020), multi-aspect composite index (Rouhou et al., 2021), and calculated score measures from financial statements (Bassemir & Novotny-Farkas, 2018). Larger disaggregation led to more and better information in financial reporting and represented better DQ (Li et al., 2021a). Therefore, we measured DQ based on the level of disaggregation of accounting information *via* the omitted items. Some of the reasons for using this scale were as follows: First, a good degree of accounting data was provided *via* disaggregated data, and it enhanced the reliability of fiscal reporting by providing managers with less freedom to handle accounting data (Chen et al., 2015). Second, although the use of scales such as absolute forecast error, multivariate composite index, and scores provided beneficial awareness, they were also impacted by different economic shifts (Li et al., 2021a). Specifically, DQ was calculated according to the formula (Chen et al., 2015; Li et al., 2021a) as follows:

$$\sum_{k=1}^7 \left\{ \left(\frac{\#Nonmissing\ items}{\#Total\ items} \right)_k \times \frac{\$Account_k}{\$Total\ Assets} \right\} \div 2$$

In which:

Non-missing items: Number of Level I items not missed in both the Balance Sheet and the Income Statement.

Total items: Total number of Level I items.

Account: Value of item k .

Total Assets: Total value of Level I items.

k : The total of Level I items in both the Balance Sheet and the Income Statement.

Most prior studies measured MM levels according to the model of Bushee (1998), with the assumption that leaders could forecast pre-tax as well as pre-R&D income in the annual accounting period. However, this prediction was quite difficult and impossible to observe. So we used R&D intensity to measure MM. This measurement was similar to many earlier papers (e.g., Jiao, 2011; Li et al., 2021b). Specifically, R&D intensity was quantified as R&D costs divided by total sales, or zero if the firm did not disclose R&D costs (Li et al., 2021b).

Generally, CG variables were classified into four groups, including board composition, proprietorship structure, management indemnification, and individual characteristics (Li et al., 2021c). Furthermore, there were some variables that were very popular in developing nations, where greatly converged stocks were taken by a family or the government. Therefore, this study focused on measuring important aspects of CG in developing as well as emerging economics based on Rezaee & Tuo, 2017 including board size, board independence, and CEO duality. Specifically, board size was measured by the number of board members of the firm at the end of the annual accounting period. Board independence was calculated by the ratio of independent, non-executive directors on the board. Additionally, CEO duality liked a binary component, which was 1 if the header of the board was also the CEO and 0 otherwise.

Ultimately, the authors evaluated the effect of control components on CP in developing nations. Specifically, these variables included capital structure (LEV), growth (GROW), firm size (SIZE), tangibility (TAN), as well as current ratio (CR). The control components are described in Table 2. These control components were not the purpose of the paper, so we only used them to examine the explanatory level of the dependent variable, even though they were measured the same way as the independent variables. In addition, these variables were carefully evaluated and selected based on earlier papers (e.g., Abu Afifa et al., 2023a, 2024a; Almasarwah et al., 2021).

Table 2. Measurement of the control variables.

Variable	Calculation	Source
LEV	Total debt divided by total assets	Shoaib and Siddiqui (2020), Miah (2021)
GROW	The percentage change in Sales	Shoaib and Siddiqui (2020), Shen et al. (2020)
SIZE	Natural logarithm of total assets	Shen et al. (2020), Hu and Zhang (2021), Liu et al. (2021)
TAN	Proportion of total fixed assets divided by total assets	Shoaib and Siddiqui (2020), Hu and Zhang (2021)
CR	Ratio of short-term assets divided by short-term liabilities	Shoaib and Siddiqui (2020), Shen et al. (2020)

Source: Created by the authors.

3.3. Data analysis steps

The hypothesis H_1 was checked by the model (1) as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 DQ_{i,t} + \beta_2 LEV_{i,t} + \beta_3 GROW_{i,t} + \beta_4 SIZE_{i,t} + \beta_5 TAN_{i,t} + \beta_6 CR_{i,t} + \varepsilon_{i,t} \quad (1)$$

where i for the firm, and t for the year.

Next, the hypotheses H_2 and H_3 were examined by the models (2) and (3), respectively, as follows:

$$ROA_{i,t} = \beta_0 + \beta_1 DQ_{i,t} + \beta_2 CG_{i,t} + \beta_3 DQ_{i,t} * CG_{i,t} + \beta_4 LEV_{i,t} + \beta_5 GROW_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 TAN_{i,t} + \beta_8 CR_{i,t} + \varepsilon_{i,t} \quad (2)$$

$$ROA_{i,t} = \beta_0 + \beta_1 DQ_{i,t} + \beta_2 MM_{i,t} + \beta_3 DQ_{i,t} * MM_{i,t} + \beta_4 LEV_{i,t} + \beta_5 GROW_{i,t} + \beta_6 SIZE_{i,t} + \beta_7 TAN_{i,t} + \beta_8 CR_{i,t} + \varepsilon_{i,t} \quad (3)$$

In the second model, CG was the representative of board size (BSIZE), board independence (BIND), as well as CEO duality (BCEO).

With panel data, fixed effects (FEM) as well as random effects (REM) estimation approaches were often utilized to evaluate and test the model. Nevertheless, a panel with numerous observations over a short interval of time sometimes causes bias because of variation in data. To deal with this phenomenon, we performed a series of necessary analyses. First, we performed tests of variance, including a modified Wald check for the FEM model as well as a Breusch and Pagan Lagrangian test for the REM model. If there was no variable variance phenomenon, the Hausman test would be utilized to confirm the more suitable FEM or REM model. If there was a phenomenon of variance, the two-step generalized method of moments (GMM) estimation method would have been utilized. Then, we checked the certainty of the results using the generalized least squares estimation method (FLGS).

In terms of validation methodology, we used the two-step GMM estimation method because of some reasons below. Compared with other methods such as autoregressive lag distribution or two-stage instrumental variable estimation, this method solved the problems of variation of variance and endogenous problems more effectively. In addition, the two-step GMM estimation was more efficient than the one-step GMM estimation. Therefore, to ensure minimal bias and maximum efficiency, we used the Arellano-Bond two-step system GMM (S-GMM). Based on the collected data characteristics, we used the S-GMM method for all proposed research models and discussed them based on this method. Then, Hansen/Sargan tests on instrumental variables were performed to check the reliability of the S-GMM estimation results.

4. Findings

Table 3 indicates the descriptive statistics as well as the correlation matrix among the components. The results show that all correlation coefficients among components

Table 3. Descriptive statistics and correlation matrix.

Variable	ROA	DQ	MM	BSIZE	BIND	BCEO	LEV	GROW	SIZE	TAN	CR
ROA	1.0000										
DQ	0.0955*	1.0000									
MM	-0.0255	0.2240*	1.0000								
BSIZE	-0.0240	-0.0158	-0.0437	1.0000							
BIND	0.0005	-0.0868*	-0.1730*	0.0264	1.0000						
BCEO	0.0088	-0.0179	0.0780*	-0.5017*	-0.3496*	1.0000					
LEV	-0.5241*	-0.0612*	-0.0291	-0.0007	-0.0029	0.0049	1.0000				
GROW	0.1145*	-0.1700*	0.0308	-0.0020	0.0018	0.0051	-0.0185	1.0000			
SIZE	-0.1060*	-0.5783*	-0.2365*	0.0171	0.0901	-0.0207	0.0615*	-0.0324	1.0000		
TAN	-0.0642*	-0.1271*	-0.0196	0.0155	0.0818*	-0.0380	-0.0091	-0.0629*	0.1453*	1.0000	
CR	0.0901*	0.0488*	0.0034	-0.0057	-0.0703*	-0.0026	-0.1160*	-0.0130	-0.0497*	-0.1355*	1.0000
Mean	0.0719	0.7357	0.0655	3.2320	1.1203	0.8181	0.5442	0.1364	9.8939	0.2983	2.1352
Standard deviation	0.1098	0.0826	0.1682	0.5978	1.6484	0.3365	1.1720	1.2570	3.0919	0.2445	2.3891

Note: * $p < 0.05$.

Source: Authors' own findings.

have been below 0.8, indicating that the independent components have no multicollinearity. Although a relatively small number of terms meet the significance condition, the data in this table only shows whether the independent component is related to the dependent one (ROA). Further tests are needed for the validity of the data series as well as rejecting the null hypothesis. Specifically, we use the Wooldridge (2010) test to further examine this problem. The results show that the panel dataset does not have autocorrelation problems because Prob > F of the ROA variable has been above the minimum degree of 0.05.

We conducted a variance inflation factor (VIF) check, and the findings demonstrate that all VIF coefficients have been below 5. Thus, our models do not have multicollinearity issues. Before employing the estimation model, the authors utilized the LLC test, as suggested by Levin et al. (2002), to scrutinize the unit root of each variable. We also utilized the Augmented Dickey and Fuller test (ADF) to check the stationarity for the balanced panel dataset. Our findings show that all of the p value are less than 5%. These indicate that the interval series components in the paper have been stable, and the hypothesis of a unit root existing has not been approved. Original least squares (OLS), the FEM, and the REM approach have been employed to estimate the study's model. As discussed above, we performed the specific tests on heteroscedasticity for the three above methods. Table 4 shows that the three above methods have heteroscedasticity issues. Specifically, the three estimates used (OLS, FEM, and REM) of all models have a p value of 0.000 (< 0.05); as a result, all models have heteroscedasticity.

Therefore, we used the GMM approach to overcome the above issues as well as solve the endogenous problem in the models. Table 5 indicates a strongly notable and favorable influence of DQ on CP (coefficient = 24.510, t -value = 15.97, and p value < 0.01), which is suitable for agency theory as well as in line with prior papers (e.g., Jiao, 2011; Qizam, 2021; Temiz, 2021; Wu et al., 2011). Moreover, MM plays a negative moderating role on the DQ-CP nexus (coefficient = -0.088, t -value = -3.24, and p value < 0.01). Similarly, CG also plays a moderating role in the DQ-CP nexus. However, according to Table 5, BIND and BCEO are positive moderators (coefficients are 1.304 and 0.657, t -values are 2.48 and 2.77, and p value are less than 0.05 and

Table 4. Heteroscedasticity tests.

Estimation method	Model (2)									
	Model (1)		BSIZE		BIND		BCEO		Model (3)	
	Chi2	Prob > chi2	Chi2	Prob > chi2	Chi2	Prob > chi2	Chi2	Prob > chi2	Chi2	Prob > chi2
FEM	53788.70	0.000	52552.82	0.000	51979.98	0.000	51931.05	0.000	52645.67	0.000
REM	228.94	0.000	220.42	0.000	221.60	0.000	222.00	0.000	231.62	0.000
OLS	4572.21	0.000	4573.39	0.000	4566.45	0.000	4564.32	0.000	4544.65	0.000

Source: Authors' own findings.

Table 5. GMM estimation.

Variable	Model (1)	Model (3)	Model (2)		
			BSIZE	BIND	BCEO
DQ	24.510 (15.97)**	15.080 (18.84)**	6.996 (12.93)**	20.611 (14.98)**	21.123 (15.40)**
MM	—	-0.069 (-3.52)**	—	—	—
DQ*MM	—	-0.088 (-3.24)**	—	—	—
BSIZE	—	—	-0.150 (-2.40)*	—	—
DQ*BSIZE	—	—	-0.175 (-2.03)*	—	—
BIND	—	—	—	0.964 (2.50)*	—
DQ*BIND	—	—	—	1.304 (2.48)*	—
BCEO	—	—	—	—	0.485 (2.78)**
DQ*BCEO	—	—	—	—	0.657 (2.77)**
LEV	-0.064 (-21.35)**	-0.053 (-30.60)**	-0.053 (-34.12)**	-0.067 (-24.39)**	-0.067 (-24.28)**
GROW	0.350 (17.23)**	0.207 (19.53)**	0.107 (15.95)**	0.312 (17.17)**	0.314 (17.14)**
SIZE	0.643 (15.93)**	0.392 (18.54)**	0.194 (14.68)**	0.552 (15.35)**	0.555 (15.34)**
TAN	-0.028 (-2.17)*	-0.042 (4.50)**	-0.134 (-9.07)**	-0.030 (-2.64)**	-0.029 (-2.62)**
CR	0.010 (2.42)*	0.004 (2.24)*	0.002 (1.69)	0.003 (2.36)*	0.003 (2.34)*
Constant	-24.349 (-15.91)**	-14.840 (-18.55)**	-6.745 (-12.39)**	-21.523 (-15.50)**	-21.447 (-15.52)**

Note: ** $p < 0.01$, * $p < 0.05$.

Source: Authors' own findings.

0.01, respectively), while BSIZE is a negative moderator nexus (coefficient = -0.175 , t -value = -2.03 , and p value < 0.05). Additionally, all control variables have significant effects on CP (all p value are less than 0.05). Ultimately, the p value of the AR (2) check have been above 0.1, thus the GMM findings have been notable.

To test for country-specific effects as an additional test, we performed the same test steps as the totals for each country sample. Tables 6A–6F show that DQ has a positive influence on CP in all countries and models (all coefficients and t -values have been above 0, as well as all p value have been below 0.05). MM negatively moderates the DQ-CP nexus in Indonesia, Thailand, Vietnam, and Malaysia (coefficients are -9.23 , -9.14 , -2.02 , and -1.23 , respectively, and p value have been below 0.05), while it has not been notable in other countries (p value > 0.05). BSIZE insignificantly moderates the DQ-CP nexus in Thailand and Vietnam (p value > 0.05), while it is substantial in other nations (p value < 0.05). Similarly, BIND significantly moderates the DQ-CP nexus in all countries (p value < 0.05) except Vietnam (p value > 0.05).

However, BCEO significantly moderates the DQ-CP nexus in all nations (all p value are less than 0.05). The findings show that our model is suitable for developing Asian countries, especially considering the impact of DQ on CP. In addition, Singapore and the Philippines show the least concordance in terms of MM because they rarely disclose R&D costs. Therefore, it is necessary to apply a different MM scale to them when studying MM more deeply. Although the effects of BSIZE and BIND are

Table 6A. GMM estimation for Indonesia.

Model	DQ	MM	DQ*MM	BSIZE	DQ*BSIZE	BIND	DQ*BIND	BCEO	DQ*BCEO	LEV	GROW	SIZE	TAN	CR	Constant
Indonesia (1)	16.23** (4.58)	—	—	—	—	—	—	—	—	-0.058** (-23.84)	0.22** (5.27)	0.43** (4.54)	-0.13** (-4.92)	-0.001 (-1.13)	-15.96** (-4.52)
(3)	8.16* (2.13)	-3.92* (-2.36)	-9.23* (-2.42)	—	—	—	—	—	—	-0.071** (-34.84)	0.14** (6.29)	0.28** (5.47)	-0.10** (-4.55)	-0.001 (-1.59)	0.24** (10.45)
(2) BSIZE	8.01** (3.55)	—	—	-0.27** (-3.56)	-0.44** (-3.84)	—	—	—	—	-0.055** (-24.38)	0.12** (4.30)	0.23** (3.99)	-0.11** (-3.76)	-0.001 (-1.31)	-7.92** (-3.53)
BIND	9.68** (3.39)	—	—	—	—	0.94** (3.26)	1.56** (3.55)	—	—	-0.060** (-25.19)	0.13** (3.96)	0.27** (3.62)	-0.11** (-4.03)	-0.001 (-1.24)	-10.64** (-3.82)
BCEO	10.18** (3.62)	—	—	—	—	—	—	0.42** (3.23)	0.70** (3.53)	-0.060** (-25.21)	0.13** (3.95)	0.27** (3.62)	-0.11** (-4.03)	-0.001* (-1.25)	-10.41** (-3.74)

Note: ** $p < 0.01$, * $p < 0.05$.

Source: Authors' own findings.

Table 6B. GMM estimation for Thailand.

Model	DQ	MM	DQ*MM	BSIZE	DQ*BSIZE	BIND	DQ*BIND	BCEO	DQ*BCEO	LEV	GROW	SIZE	TAN	CR	Constant
Thailand (1)	12.55** (9.18)	—	—	—	—	—	—	—	—	-0.33** (-8.26)	0.18** (9.40)	0.34** (9.42)	-0.02 (-1.66)	-0.01* (-1.99)	-12.35** (-9.04)
(3)	0.14** (5.95)	-2.98** (-2.72)	-9.14** (-2.13)	—	—	—	—	—	—	-0.17** (-7.81)	0.13** (9.28)	0.25** (9.17)	-0.01 (-0.93)	0.001 (0.05)	1.57 (1.11)
(2) BSIZE	8.77** (8.40)	—	—	0.18 (1.35)	0.27 (1.45)	—	—	—	—	-0.13** (-6.81)	0.11** (8.52)	0.22** (8.41)	-0.02 (-1.17)	0.002 (0.78)	-8.62** (-8.19)
BIND	7.52** (8.70)	—	—	—	—	1.02* (2.32)	1.38* (2.22)	—	—	-0.16** (-7.00)	0.11** (9.65)	0.21** (9.62)	-0.01 (-1.23)	-0.001 (-0.49)	-8.52** (-9.55)
BCEO	8.18** (6.97)	—	—	—	—	—	—	0.41* (2.10)	0.54* (2.00)	-0.18** (-6.28)	0.12** (7.15)	0.22** (7.09)	-0.02 (-1.31)	-0.002 (-0.58)	-8.44** (-7.12)

Note: ** $p < 0.01$, * $p < 0.05$.

Source: Authors' own findings.

Table 6C. GMM estimation for Vietnam.

Model	DQ	MM	DQ*MM	BSIZE	DQ*BSIZE	BIND	DQ*BIND	BCEO	DQ*BCEO	LEV	GROW	SIZE	TAN	CR	Constant
Vietnam (1)	11.03** (7.60)	—	—	—	—	—	—	—	—	-0.35** (-10.39)	0.15** (7.74)	0.30** (7.82)	-0.06* (-2.60)	-0.01** (-3.47)	-10.85** (-7.47)
(3)	8.83** (7.89)	-1.65** (-4.30)	-2.02** (-4.13)	—	—	—	—	—	—	-0.23** (-10.19)	0.09** (6.73)	0.19** (6.81)	-0.01 (-0.42)	-0.002 (-1.40)	-6.73** (-6.29)
(2)	6.70** (6.47)	—	—	0.05 (0.38)	0.08 (0.51)	—	—	—	—	-0.21* (-10.00)	0.09** (6.49)	0.18** (6.76)	-0.001 (-1.01)	-0.01** (-3.63)	-6.55** (-6.21)
	3.63** (2.96)	—	—	—	—	0.58 (1.75)	0.78 (1.89)	—	—	-0.23** (-8.79)	0.06** (3.72)	0.11** (3.60)	-0.02 (-1.20)	-0.003* (-2.52)	-4.18** (-3.53)
	4.40** (2.89)	—	—	—	—	—	—	0.51* (2.15)	0.58* (1.99)	-0.25** (-7.76)	0.06** (2.90)	0.13* (3.04)	-0.03 (-1.63)	-0.003* (-2.15)	-4.76** (-3.03)

Note: ** $p < 0.01$, * $p < 0.05$.

Source: Authors' own findings.

Table 6D. GMM estimation for Singapore.

Model	DQ	MM	DQ*MM	BSIZE	DQ*BSIZE	BIND	DQ*BIND	BCEO	DQ*BCEO	LEV	GROW	SIZE	TAN	CR	Constant
Singapore (1)	10.47** (8.84)	—	—	—	—	—	—	—	—	-0.07* (-2.27)	0.15** (9.45)	0.26** (8.35)	0.02 (1.19)	-0.002 (-0.71)	-10.22** (-8.65)
(3)	4.24** (1.37)	-2.53 (-1.29)	-3.33 (-1.29)	—	—	—	—	—	—	-0.06* (-2.27)	0.13** (9.60)	0.22** (8.25)	0.03 (1.73)	-0.002 (-0.97)	-8.83** (-8.63)
(2)	5.75** (5.41)	—	—	-0.45** (-4.83)	-0.58** (-4.92)	—	—	—	—	-0.05* (-2.13)	0.10** (7.40)	0.17** (6.20)	0.05* (2.35)	-0.001 (-0.64)	-5.36** (-5.02)
	8.69** (7.85)	—	—	—	—	0.81* (2.44)	1.10* (2.59)	—	—	-0.06* (-2.28)	0.13** (9.04)	0.23** (7.75)	0.03 (1.83)	-0.002 (-0.99)	-9.38** (-8.29)
	5.73** (4.25)	—	—	—	—	—	—	0.32* (2.03)	3.41* (2.19)	-0.08** (-2.66)	0.08** (4.48)	0.14** (3.82)	0.02* (1.09)	-0.01* (-2.04)	-5.80** (-4.25)

Note: ** $p < 0.01$, * $p < 0.05$.

Source: Authors' own findings.

Table 6E. GMM estimation for Malaysia.

Model	DQ	MM	DQ*MM	BFSIZE	DQ*BFSIZE	BIND	DQ*BIND	BCEO	DQ*BCEO	LEV	GROW	SIZE	TAN	CR	Constant
Malaysia (1)	8.28** (5.04)	—	—	—	—	—	—	—	—	0.32** (5.76)	0.18** (8.90)	0.19** (4.34)	-0.07* (-2.34)	0.03** (5.78)	-8.16** (-4.97)
(3)	5.45** (3.86)	-1.12** (-2.61)	-1.23* (-2.28)	—	—	—	—	—	—	0.07* (2.06)	0.09** (5.84)	0.08* (2.31)	-0.02 (-1.01)	0.01* (1.99)	-3.92** (-2.88)
(2) BSIZE	7.37** (6.89)	—	—	-0.57** (-3.47)	-0.71** (-3.33)	—	—	—	—	0.08** (3.18)	0.12** (9.54)	0.21** (8.37)	-0.05** (-2.84)	0.01* (2.39)	-6.84** (-6.22)
BIND	5.96** (4.13)	—	—	—	—	2.36** (3.54)	2.96** (3.47)	—	—	0.20** (4.52)	0.16** (9.11)	0.16** (4.23)	-0.02 (-1.15)	0.01** (3.78)	-8.33** (-5.78)
BCEO	6.95** (5.00)	—	—	—	—	—	—	1.18** (3.88)	1.48** (3.82)	0.19** (4.52)	0.16** (9.09)	0.16** (4.25)	-0.02 (-1.09)	0.01** (3.75)	-7.94** (-5.64)

Note: ** $p < 0.01$, * $p < 0.05$.

Source: Authors' own findings.

Table 6F. GMM estimation for Philippines.

Model	DQ	MM	DQ*MM	BSIZE	DQ*BSIZE	BIND	DQ*BIND	BCEO	DQ*BCEO	LEV	GROW	SIZE	TAN	CR	Constant
Philippines (1)	9.84** (9.82)	—	—	—	—	—	—	—	—	0.03** (2.73)	0.16** (12.23)	0.26** (9.76)	-0.05** (-2.81)	0.01* (2.36)	-9.76** (-9.76)
(3)	7.20** (6.77)	-0.71 (-1.31)	-0.99 (-1.32)	—	—	—	—	—	—	-0.02* (-2.37)	0.11** (10.34)	0.17** (7.77)	-0.04* (-2.09)	0.002 (1.41)	-6.15** (-7.57)
(2)	7.53** (7.50)	—	—	-0.23* (-2.37)	-0.31* (-2.30)	—	—	—	—	0.03** (3.26)	0.15** (11.70)	0.22** (8.72)	-0.04* (-2.04)	0.01* (2.60)	-7.42** (-7.39)
BIND	7.44** (7.79)	—	—	—	—	0.92* (2.22)	1.28* (2.17)	—	—	0.03** (3.28)	0.14** (11.78)	0.21** (8.71)	-0.04* (-2.49)	0.004* (2.43)	-8.43** (-9.19)
BCEO	7.84** (8.62)	—	—	—	—	—	—	0.43* (2.23)	0.60* (2.18)	0.03** (3.28)	0.14** (11.74)	0.21** (8.68)	-0.04* (-2.47)	0.004* (2.43)	-8.21** (-9.08)

Note:** $p < 0.01$, * $p < 0.05$.

Source: Authors' own findings.

inconsistent, it can be seen that CG acts as a significant moderator for the DQ-CP relationship. Therefore, developing Asian firms need to restrict the manager's MM and enhance CG to raise CP. Thus, we suggest that enterprises must strictly manage R&D costs to prevent MM behavior. Accordingly, enterprises should make estimates and require managers to publicize the setting up and use of these expenses. Additionally, the more independent the board of directors and the need for the head to perform well in his role, the higher the CP.

Besides, we continue to consider the appropriateness of the models, including the goodness of fit $\chi^2 > 0.05$ (Pituch & Stevens, 2015), the difference compared with the predictive model SRMR < 0.05 (Schumacker & Lomax, 2004) and $0.05 < RMSEA < 0.08$ (Pituch & Stevens, 2015), and the concordance with other models $0.9 < CFI < 1$ and $0.9 < TLI < 1$ (Schumacker & Lomax, 2004). The results show that the necessary indices of suitability all meet the acceptable threshold.

Finally, the authors employed the FGLS approach to consider the results of the GMM approach for the models. Table 7 shows that the coefficients of DQ, MM, as well as CG components (i.e., BSIZE, BIND, and BCEO) have all been statistically notable and in line with the GMM approach (all coefficients are either positively or negatively in estimation models, and all *p* value are less than 0.05). Specifically, in model (1), the coefficients as well as notable levels of the factors in the GMM (Table 6) and FGLS (Table 7) models are similar in magnitude and direction of impact. Similar results can be seen in models (2) and (3). Therefore, the estimated findings of the model have been rather robust. Consequently, the direct influence of DQ on CP and the moderating effects of CG and MM on the DQ-CP relationship in our study are reliable and meaningful.

In addition, the authors consider the influence of the COVID-19 epidemic on the components of the research model. Thereby, the GMM approach has been employed to consider the panel dataset for the interval 2019–2021. Table 8 demonstrates that DQ, DQ*MM, and DQ*BSIZE are statistically significant (coefficients are 20.111, –0.221, and 0.060, respectively, and *p* value are less than 0.05), while DQ*BIND and DQ*BCEO are not (*p* value > 0.05). Specifically, in models (1) and (3), all factors

Table 7. FGLS estimation.

Variable	Model (1)	Model (3)	Model (2)		
			BSIZE	BIND	BCEO
DQ	7.378 (13.72)**	7.456 (14.17)**	7.283 (13.32)**	7.292 (13.45)**	7.358 (13.68)**
MM	—	–2.273 (–2.07)*	—	—	—
DQ*MM	—	–9.014 (–2.05)*	—	—	—
BSIZE	—	—	–0.036 (–2.06)*	—	—
DQ*BSIZE	—	—	–0.042 (–2.04)*	—	—
BIND	—	—	—	0.166 (2.22)*	—
DQ*BIND	—	—	—	0.205 (2.08)*	—
BCEO	—	—	—	—	0.077 (2.05)*
DQ*BCEO	—	—	—	—	0.096 (2.04)*
LEV	–0.046 (–25.67)**	–0.046 (–25.63)**	–0.046 (–25.70)**	–0.046 (–25.71)**	–0.046 (–25.71)**
GROW	0.107 (14.55)**	0.109 (14.73)**	0.107 (14.56)**	0.106 (14.54)**	0.107 (14.54)**
SIZE	0.192 (13.54)**	0.196 (13.72)**	0.192 (13.55)**	0.192 (13.54)**	0.192 (13.54)**
TAN	–0.030 (–3.49)**	–0.030 (–3.45)**	–0.030 (–3.44)**	–0.030 (–3.43)**	–0.030 (–3.43)**
CR	0.002 (1.97)*	0.002 (1.97)*	0.002 (1.94)	0.002 (2.01)*	0.002 (2.00)*
Constant	–7.239 (–13.49)**	0.141 (18.20)**	–7.123 (–13.03)**	–7.333 (–13.58)**	–7.298 (–13.58)**

Note: ***p* < 0.01, **p* < 0.05.

Source: Authors' own findings.

Table 8. GMM estimation for the COVID-19 epidemic period.

Variable	Model (1)	Model (3)	Model (2)		
			BSIZE	BIND	BCEO
DQ	20.111 (1.99)*	5.288 (3.72)**	6.171 (4.57)**	5.028 (4.14)**	19.345 (4.10)**
MM	—	-0.175 (-3.12)**	—	—	—
DQ*MM	—	-0.221 (-2.38)*	—	—	—
BSIZE	—	—	0.100 (3.04)**	—	—
DQ*BSIZE	—	—	0.060 (2.10)*	—	—
BIND	—	—	—	-0.104 (-1.40)	—
DQ*BIND	—	—	—	0.034 (1.17)	—
BCEO	—	—	—	—	0.242 (1.23)
DQ*BCEO	—	—	—	—	0.275 (1.15)
LEV	-0.589 (-2.32)*	-0.118 (-1.99)*	-0.146 (-2.67)**	-0.142 (-2.90)**	-0.196 (-2.07)*
GROW	0.300 (2.10)*	0.071 (3.69)**	0.084 (4.66)**	0.069 (4.24)**	0.274 (4.18)**
SIZE	0.532 (2.01)*	0.130 (3.52)**	0.156 (4.46)**	0.130 (4.11)**	0.508 (4.13)**
TAN	-0.106 (-1.31)	-0.001 (-1.01)	-0.051 (-1.33)	-0.047 (-2.26)*	-0.026 (-0.83)
CR	-0.071 (2.02)*	0.017 (2.13)*	0.007 (1.32)	-0.001 (-1.18)	0.001 (0.21)
Constant	-19.537 (-1.93)	-4.943 (-3.44)**	-6.183 (-4.52)**	-4.786 (-3.90)**	-19.356 (-4.12)**

Note: ** $p < 0.01$, * $p < 0.05$.

Source: Authors' own findings.

reach statistical significance except the TAN variable. For model (2), in the sub-model of BSIZE, the factors TAN and CR are not statistically significant. In the BIND sub-model, the BIND, DQ*BIND, and CR factors are not statistically significant. Following that, in the BCEO sub-model, there are four factors that do not reach statistical significance, such as BCEO, DQ*BCEO, TAN, and CR. This implies board independence as well as CEO duality have not influenced the DQ-CP nexus when the epidemic occurs. In addition, BSIZE has a positive moderating influence on the DQ-CP nexus during the epidemic period. This indicates that in an emergency situation, the bigger the board, the more effective it has been. In contrast, the impact of MM remains consistent and tends to increase compared to pre-epidemic. It can be seen that managers use MM as a utensil to lessen the bad influences of the epidemic.

5. Discussion

The results indicate that all of the hypotheses have been approved. Thus, DQ has a favorable influence on CP in developing regions' firms. Additionally, regarding the findings of hypothesis checking as well as bootstrapping confidence period analysis, it could be concluded that MM and CG are negative and positive moderators for the DQ-CP nexus, respectively.

It could be concluded that fiscal CP has been greatly impacted by the information reported in the fiscal statements. Based on the paper, the greater the DQ, the less data has been omitted. Thereby, the data reported in the fiscal reporting has been disclosed more completely and gives more relevant information. It benefits a greater fiscal CP. Thus, firms must enhance the DQ of their fiscal reporting by enhancing the degree of non-omission of important items, particularly by speeding up the application of IFRS instead of national accounting standards. Furthermore, both MM and CG exhibit regulatory roles in the effects of DQ on CP. The fact that firms increase R&D costs will improve the MM as well as somewhat lessen the impact of DQ on CP. Specifically, the manager's MM behavior is partly reflected through

misrepresentation or falsification of essential items. This inadvertently reduces the DQ of the financial statements, which in turn reduces the CP. This incident, if repeated, will gradually worsen the image of the firm among related parties. This is very dangerous, especially in Asian countries where people's perceptions are always influenced by appearance (Kong et al., 2022). In contrast, a firm with an effective CG mechanism will create an impetus for increased disclosure of information items and enhance the DQ of fiscal reporting and CP, respectively. Specifically, if managers strengthen the review of information disclosure on the accounting department's financial statements, it will limit the omission of disclosure or intentional omission of essential items.

The paper could be viewed as the next part and has similarities with earlier papers on the DQ-CP link (e.g., Qizam, 2021; Temiz, 2021) when verifying that DQ has a favorable influence on CP. Furthermore, we investigate the complex association among DQ, MM, CG, and CP in the post-epidemic circumstances of COVID-19. Particularly, the study examines the influence of DQ, MM, and CG on CP in the single evidence-based model. We also integrate the impact of MM and CG on the DQ-CP nexus in our model. Next, this paper's results provide decision-makers with more nuanced explanations for the effect of MM and CG on the DQ-CP link. This complements the existing literature on MM (e.g., Bhojraj & Libby, 2005; Kolasinski & Yang, 2018). Decision-makers can employ the insights to create their decisions by utilizing the DQ and CG as indicators to forecast future CP. Accordingly, firms need to build a strong CG team in terms of quantity (e.g., size) and quality (e.g., independence, specialism) to be able to meet today's dynamic and complex changes. Furthermore, policymakers can employ the results to make guidelines that could enhance CP degrees by paying attention to the role of MM as well as CG in DQ. Specifically, firms need to have separate departments to evaluate the MM level of the leadership team. This assessment must ensure objective and regular principles to gradually limit MM behavior.

Another significant benefit of our findings has been to verify the usefulness of measuring DQ based on the level of disaggregation of data. In spite of a small sample of developing nations, the authors indicate that the disaggregation of data perfectly represents the DQ. It can be seen that related parties have just taken a simple measure based on data from fiscal statements. Since the data has been reachable as well as understandable, quantifying DQ according to the level of disaggregation of the data regarding the omitted items has been useful for related-party evaluation. In addition, quantifying DQ with this approach assists in the application of IFRS in developing regions. In spite of its controversy, IFRS has been played to enhance transparency as well as associated value for related parties. While several nations have implemented IFRS (i.e., Malaysia), others have not (i.e., Vietnam). It leads to many items being omitted and influences both DQ and CP, respectively.

Ultimately, our general results show that all the control components in the model are statistically significant. The finding has been in line with the results of recent papers (e.g., Abu Afifa et al., 2023a, 2024a; Almasarwah et al., 2021). Although these are not the main factors that this study focuses on, this result helps to increase the reliability of our model because we have considered almost all the factors that affect CP.

6. Conclusion

Our paper has been implemented to recognize the influence of DQ on CP as well as the moderating influence of CG and MM on the DQ-CP link in firms listed on the stock exchange of some developing ASEAN nations (i.e., Indonesia, Thailand, Vietnam, Singapore, Malaysia, and the Philippines) during the interval 2012–2021. Specifically, we demonstrate the direct influence of DQ on CP by examining the moderating effect of MM. On the other hand, we attempt to explain how CG affects the DQ-CP nexus. The study utilizes the level of disaggregation of accounting information as a proxy for DQ as well as employs the GMM approach to deal with the endogenous issues of the panel dataset in the models. The results indicate that DQ has a direct favorable influence on CP. Thus, MM and CG are negative and positive moderators for the DQ-CP nexus, respectively.

Our paper has a number of notable contributions, as follows: Regarding the theoretical contribution, the outcomes of the paper benefit the body of literature by supplementing modern explanations connected to agency theory. The results give more fulfilling explanations for the influences of MM and CG on the DQ-CP nexus for related parties. Specifically, this study fills the gap in the assessment of DQ and its influence on CP in developing regional circumstances (e.g., ASEAN). Most notably, this paper has emphasized and highlighted the moderating role of MM and CG on the complex mechanism of the nexus between DQ and CP. This finding provides a comprehensive perspective for scholars in the research stream on financial reporting quality as well as operating performance.

In terms of practical contribution, related parties (i.e., current as well as potential investors) can employ the insights to create their judgments by utilizing the DQ and CG as components to anticipate later CP. Therefore, managers should consider implementing effective CG when necessary to enhance the CP. In particular, firm heads have to focus on enhancing the firm's DQ components. Presently, nations aim to reduce the effect of purely fiscal indicators as well as gradually shift their awareness to non-fiscal ones. It drives more inflexible requirements from related parties to make long-term benefits for the firm. Consequently, multinational firms have to fully follow IFRS and the local nation's laws to improve DQ, CP, and other non-fiscal components.

Regarding policy contributions, policymakers can employ the results to support recommendations for enhancing CP degrees by paying attention to the functions of MM and CG in DQ. Particularly for a firm with an effective CG mechanism, the DQ-CP nexus is stronger and stronger. Accordingly, the governments of ASEAN countries need to establish and put into law a monitoring and reporting mechanism on MM and CG for listed firms. This may be accompanied by mandatory disclosure regulations that public firms must comply with. Currently, the government needs to make and drive the market *via* an approach to motivate as well as lessen risks in investment operations, in addition to shaping effective assistance frameworks and strategies. Governments have to encourage firms that improve related-party benefits on both fiscal and non-fiscal components.

The findings should be regarded as having some shortcomings. First of all, the paper pays attention to inner micro-components. Future scholars can intentionally

discover further outcome components and scrutinize the interplays of CG features as well as other components, thereby shaping a more absolute theoretical approach. Otherwise, the study only pays attention to CP in the circumstances of the effects of DQ, MM, and CG. Future scholars can look at organizational performance from a broader perspective, including financial and non-financial performance, especially environmental performance. The authors comprise only six ASEAN nations with 1,810 firm-year observations. Later studies can expand our model by including other developing regions for more comprehensive findings.

Note

1. Asian Development Outlook (ADO) 2019 Update: Fostering Growth and Inclusion in Asia's Cities | Asian Development Bank (adb.org).

Disclosure statement

No potential conflict of interest was reported by the author(s).

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