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BANKING & FINANCE | RESEARCH ARTICLE

Board of directors characteristics affect commercial banks' performance – evidence in Vietnam

Nguyen Kim Quoc Trung^{1*}

Abstract: This study aims to identify the board of directors' characteristics affecting commercial banks' performance in Vietnam. The paper is based on the data collected over eleven years (2010–2020) for a set of 35 Vietnamese commercial banks listed on the stock market. The author explores the board of director characteristics affecting banks' performance in Vietnam on the platform of the quantitative regression method-System Generalised Method of Moments. The paper concludes that the statistically significant factors that involve the BOD's characteristics affect banks' performance, namely board size, nationality diversity and board of directors' advanced education. The author also demonstrates the influence of ownership structures on those banks' performances. The results reveal that banks are owned and controlled by the government, and ownership concentration can improve and increase their performance. The author clarifies the role of the ownership concentration factor in the relationship to a bank's performance. Significantly, commercial banks, which have their shareholders own over 5% of shares, namely institutions, the government, and members of the board of directors, can improve their

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Nguyen Kim Quoc Trung is currently a lecturer of the Faculty of Accounting - Auditing; the University of Finance – Marketing, Vietnam. He is interested in researching the banking sector and finance and accounting. His fields of research and teaching are banking, finance, and governance. He has written a total of some articles in various international journals and conferences, including *International Journal of Economics and Finance Studies*, *Cogent Business & Management*, and has served as a reviewer of some international journals listed in Scopus, such as *Cogent Economics and Finance*, *International Journal of Law and Management*.

PUBLIC INTEREST STATEMENT

The Bank is also a particular business category in which shareholders invest in the banks to maximize profits or increase the earnings per share.

This study aims to identify the board of directors' characteristics affecting commercial banks' performance in Vietnam. The article is based on corporate governance theory and other theories related to the role of the board of directors to explain the impact of board characteristics on the Vietnamese commercial banks' performance. On the platform of the quantitative regression method, the System Generalised Method of Moments, the author investigates the following statistically significant factors affecting banks' performance, namely the lagged of banks' performance, the board size, nationality diversity, board of directors' advanced education, audit firm type, leverage, and inflation. Besides, the author also explores the influence of ownership structures on those banks' performance. The results reveal that banks are owned and controlled by the government, and ownership concentration can improve and increase their performance.

performance because these shareholders have strict mechanisms to monitor and control the bank's activities to minimize risks and increase the commercial bank's performance.

Subjects: Banking; Credit & Credit Institutions; Business; Management and Accounting;

Keywords: Board of directors; commercial bank; generalised method of moments; ownership structure; performance; Tobin's Q; Vietnam

JEL classification: G21; L25; H21; H81

1. Introduction

In a sensitive and competitive market, a bank's performance can be hurt, and its consequences can spread to many parties in the economy. The failure of banks causes issues, such as customers' frozen deposits and shrinking credit lines in the company. Furthermore, the negative externalities of bank failure, which typically create a domino effect, pose a systemic risk to the banking sector (Quoc Trung, 2021a). Hence, the government and the Central Bank should inspect and supervise the bank's operations carefully and strictly. Remarkably, commercial banks must ensure the management, control, and supervision policies proposed by the board of directors and managers.

Setiyono and Tarazi (2018) highlight the board of directors' role in fully executing functions to maximize the benefits of shareholders and related parties to ensure that being under the board of directors' control can reduce the bank's risks and improve the bank's performance. Adams and Ferreira (2007) report that BOD has two related functions, namely, consultancy and supervision. In addition, Fama and Jensen (1983) also assert that the advisory function of the BOD provides strategic direction for the banks and accesses the usage of resources appropriately and effectively.

Setiyono and Tarazi (2018), García-Meca et al. (2015), Tariah (2019), Brahma et al. (2020), and Kanakriyah (2021) have explored some characteristics of BOD affecting organizational performance, including the bank's performance. These studies emphasize the performance under the accounting measurement, which is measured by returns on assets and returns on equity (Kanakriyah, 2021; Setiyono & Tarazi, 2018; Tariah, 2019). Most of those studies have not mentioned the effect of ownership structure on a bank's performance. They only apply the fixed effect model (FEM) and random effect model (REM) without considering the endogeneity problem. Their findings confirm diversity on the board, namely gender, citizenship, age, experience, tenure, ethnicity, nationality, education level, and type, which affect a bank's performance. However, those studies do not reflect the volatility of performance in line with the market value of the firms or banks, and thus, García-Meca et al. (2015) and Brahma et al. (2020) consider the index Tobin's Q to measure a bank's performance. Although they have conducted their studies using the Generalized Method of Moments (GMM) method to solve the endogeneity problem, the results only show gender and national diversity influencing performance.

Some studies in Vietnam also explore the effects of BOD characteristics on a bank's performance, such as Phan (2012), Nguyen (2015), Tran and Pham (2020) and Nguyen and Do (2020). Because of the lack of transparency in Vietnam's stock market, research findings on the effects of BOD characteristics, ownership structure, and audit firm type on a bank's performance have been inconsistent.

In confirmation, previous studies have not investigated all the characteristics of BOD and the ownership structure affecting banks' performance. On the platform of agency theory and resource dependency theory, the ownership structure affects the strategic planning of the business. Hence, the board of directors' role practically emphasizes it affects the bank's performance. Hence, this paper aims to empirically estimate the determinants of BOD affecting Vietnamese banks'

performance measured by market value. The study also uses SGMM to test the efficiency and reliability of the findings.

This paper is organized as follows. After the introduction, the literature review involved corporate governance, agency theory, stewardship theory, stakeholder theory and constraints resources theory. Based on these theories, the hypotheses are developed. The third section analyses the previous studies and the research method to answer the research question, “What are the characteristics of BOD and ownership structure affecting commercial bank’s performance in Vietnam?” The study’s findings are interpreted and discussed in the next section. In the final section, the author also identifies some limitations of this study and suggests future research.

2. Literature review and hypothesis development

2.1. Theoretical framework

2.1.1. Corporate governance and the role of BOD

Corporate governance is a vital part of the mechanism for evaluating an organization’s performance and the reliability of its management. Especially in the current dynamic and globalized economic environment, organizations continuously look for new business opportunities to enhance competitiveness and performance (Suhaimi et al., 2017). Poor corporate governance, including lack of responsibility for work, lack of risk management skills, low corporate social responsibility, tax non-compliance and weak internal control, pose risks to the organization that reduces its reputation and increase fraud and moral hazard in the organization (Karim et al., 2018; Nawawi & Salin, 2018; Nor et al., 2017; Norbit et al., 2017; Omar et al., 2016; Salin et al., 2017). Thus, the corporate governance mechanism takes an increasingly important role in operating and refers to a set of practical principles and processes for control and provides a sound direction for the organization’s success. Corporate governance assists a balance of interests among stakeholders with different rights and obligations in an enterprise. It also has strict supervision mechanisms, strict regulations, inspection, and control processes that have forced banks to do business more efficiently (Quoc Trung, 2021b).

Corporate governance is a system or structure that provides guidelines for directing and controlling business activities. A firm with an effective corporate governance mechanism promotes financial statements’ transparency, reliability, and quality. Besides, good corporate governance ensures more efficient investment decisions and increases the company’s value (F. Chen et al., 2011; Husnin et al., 2016; Jais et al., 2016; Salin, 2017). The Basel Committee on Banking Supervision (2010) emphasizes the effective application of corporate governance to achieve and maintain public confidence in the banking system. In the corporate governance structure, Donaldson (1990) asserts that the top level of management in an organization is controlled by the board of directors, monitoring programs and different binding policies. R. I. Tricker (1994), Shleifer and Vishny (1997) and Monks and Minow (2012) argue that the specific corporate governance structure represents how the company’s sponsors (creditors, shareholders, investors, and other parties) can protect their benefits that affect the direction and effectiveness of the corporation. According to independent resource theory and stewardship theory, corporate governance ensures that resources are used as efficiently as possible based on the responsibilities and interests of individuals, corporations and communities.

2.1.2. Agency theory

From the practical point of view, owners’ constraints have related to management and operation ability (Quoc Trung, 2021b).

Hiring managers to deal with entity activities is necessary, including steadily increasing performance and earning per share. The managers’ presence in the entity has accelerated the conflicts of interests between owners and managers (Shah, 2014), which is considered a platform of agency

theory, formulated by Jensen and Meckling (1976) and later developed by Fama and Jensen (1983) (Quoc Trung, 2021b). The core of this theory is the arrangement of conflicting interests through the separation of ownership and control of the organization (management rights).

Moreover, Jensen and Meckling (1976) have empirically revealed how to assign shares between managers and owners to reconcile the shareholders' different interests. The shareholders have two categories: insider shareholders who control the company with exclusive voting rights and non-voting shareholders. These categories are entitled to equal dividends per share (Quoc Trung, 2021b). Thus, according to Letza et al. (2008), managers focus on maximizing shareholder value if it does not conflict with their interests.

However, representatives' problems are not limited to the relationship between the owner and the manager but also involve other parties (stakeholders). Jensen and Meckling (1976) argue that the agency problem could be minimized if owners and managers worked together to supervise and closely control organizational operations; otherwise, this problem could harm corporate value (Ang et al., 2000).

Eisenhardt (1989) emphasized that an appropriate corporate governance system can reduce conflicts within the agency problem. Several mechanisms are used to reduce conflict in the owner-manager relationship, including managerial ownership (Jensen & Meckling, 1976), executive compensation (Core et al., 1999), leverage ratio and debt (Friedman & Viswanath, 1994), the labour market (Fama, 1980), BOD (Rosenstein & Wyatt, 1990), blockholders (Burkart et al., 1997), dividends (Jensen, 1986; Myers, 2000; Park, 2009) and the market for corporate control (Kini et al., 2004).

2.1.3. Stakeholder theory

Freeman (1984) states that the fundamental aspect of stakeholder theory is identifying, developing, and managing close coordination among stakeholders. The theory focuses on broader stakeholder groups and establishes a framework to determine the relationships between all stakeholders in ensuring their benefits and minimizing the risks for all relevant parties. Many corporations, including commercial banks, strive to maximize shareholder wealth and emphasize the roles and interests of other stakeholders. This theory is a prominent corporate governance theory because it explains the accountability of the directors to more parties (stakeholders) than the shareholders. Otherwise, this theory states that corporate performance cannot be measured solely based on benefits to shareholders (Jensen, 2001).

Therefore, stakeholder theory suggests that managers should decide based on the interests of the organization's stakeholders. However, there is no specific benefit for each stakeholder group from the organization, and thus, it is difficult for managers to determine the profits and interests of each group and all groups of stakeholders and satisfy the organization's objectives. Even in stakeholder theory, the interests of groups of individuals compete, which further leads to managers being unable to make specific decisions (Jensen, 2001).

2.1.4. Stewardship theory

In the stewardship theory, shareholder gains are maximized when shareholders serve as a chairman on the board of directors and executive directors. It has supplanted the agency theory of management motivation (Donaldson & Davis, 1991). D.R. Dalton and Kesner (1987) report that about 8% of U.S. companies have their chief executive officer (CEO) as the chairman of the board of directors. Based on the stewardship theory, these authors analyse the relationship between the proportion of people in the organization and the company's performance. The goal of a CEO is to work efficiently while also being a good steward of the company's assets because the theory assumes that there is no dispute or trouble about the motivations of top management.

According to stewardship theory, managers serve as responsible stewards of the firm's assets (Davis et al., 1997). The agent model is the theoretical foundation of management actions. Their actions are cooperative and pro-organizational. The manager's primary goal meets the organization's objectives, which are conducted through higher stock prices and returns, with the aims related to the parties' gain. According to this theory, the board of directors and management are the same management group. The board of directors, sometimes known as the manager, essentially assists and supports management and the CEO. According to management philosophers, corporate growth and shareholder pleasure are expected to have a meaningful relationship.

2.1.5. Resource dependency theory

Resource dependency theory explains how a firm's external resources influence its behaviour and strategic perspectives in corporate governance (Pettigrew, 1992). Therefore, acquiring external resources is very important for any organization to exist and grow. This theory also explains that the management level becomes a significant factor in connecting the firm's development to the resources it needs to accomplish the firm's goals.

Empirical studies reveal that environmental constraints cause banks to suffer some difficulties in their operations. The difference in resources seriously affects banks because their investment activities depend mainly on capital mobilized from entities in the economy. In economic integration and development, capital mobilization is an essential factor for the survival of commercial banks. Thus, banks have the option of adjusting their loan-to-deposit ratio (LDR), for instance, by issuing fewer loans or making deposit accounts more attractive (Morris, 2007) to ensure liquidity so that the bank can flexibly use external resources (customer deposits) and internal resources (equity). Based on this theory, Morris (2007) analyses the independent effects of both sources of constraints on organizational change.

2.1.6. Asymmetric information

Agency problems are caused by a misalignment of interests between principals and agents (Jensen & Meckling, 1976). Because of asymmetric information, the principals are unable to monitor and measure their agents' behaviour, so agency issues cannot be solved perfectly. Information asymmetry is defined by Klein, O'Brien, and Peters (2002) as the number of unbalanced information managers has in comparison to other outside parties. As a result, this problem creates differential competing interests among the various groups (Morgado & Pindado, 2003). Therefore, corporate governance, which is a mechanism to execute the ultimate power of the board of directors, aims to limit agency costs through the control of managerial actions and the reduction of information asymmetry borne by them (Deshmukh, 2005; Rutherford & Buchholtz, 2007; Cheng et al., 2007). They point out that shareholder benefits are impaired in companies with ineffective corporate governance from boards of directors. Consequently, they attempt to seek the appropriate corporate governance to increase information transparency and enhance the efficiency of their investments.

2.2. Empirical research

Pathan et al. (2008) examine the relationships between independent members of BOD and board size and the performance of local commercial banks in Thailand from 1999 to 2003. They discovered negative and statistically significant results between ROA and ROE indicators and the size of the board of directors of Thai banks because of their studies, which included data from 64 banks.

Ujunwa et al. (2012) investigate the effects of diversity in BOD on the listed firms' performance in Nigeria with panel data of 122 corporations. The result shows that gender diversification negatively affects firm performance, while nationality and ethnicity in BOD are positively meaningful.

Setiyono and Tarazi (2018) analyse the influence of board members' diverse characteristics on the efficiency and risk of banking activities. Using data from Indonesian banks from 2001 to 2011, including 4,200 observations of five individuals and 21 ethnic groups, the authors estimate

diversity by looking at different dimensions and find that it has a significant effect on bank performance. Diversity is generally positively related to bank performance, excluding ethnicity. The presence of gender (women) and occupational diversity reduce risk, but national and ethnic diversity is associated with higher risk. Diversity in education levels leads to higher volatility and higher leverage risk.

Tariah (2019) examines the relationship between gender and ethnic diversity on the board of directors and firm performance (ROA). The study explains the endogeneity problem by conducting regression using a fixed-effects model to examine this relationship. The results show a positive relationship between gender diversity and CEO diversity and firm performance.

In Brahma et al. (2020), the authors study gender diversity in BOD and firm performance (measured by ROA and Tobin's Q) in the UK. Results show that BOD with three or more female members substantially affect a company's performance. In addition, Brahma et al. (2020) also show the effects of age, education, and job position that have a positive impact on companies' performance.

Kanakriyah (2021) examines the effects of board characteristics on the firm performance of listed companies on the Amman Stock Exchange (ASE) from 2015 to 2019 in Jordan. The board of directors' characteristics includes ownership of the manager, CEO duality, BOD independence, gender diversity, diversity of nationalities, educational level, board meetings, the board size, firm size, and firm age that affect the return on assets and return on equity. The results find firm age and education level hurt performance.

Many empirical studies in Vietnam have also analysed and estimated BOD characteristics affecting the performance of companies and commercial banks. Concretely, Phan (2012) studies the effects of BOD's features on corporate performance. BOD's components are board size, female members, percentage of capital owned BOD, duality, academic level education and independent non-executive members that affect Tobin's Q.

Nguyen (2015) shows the effects of BOD components on firms' performance. The BOD components include the board size, female members, the percentage of capital owned by BOD, duality and non-executive members of BOD. The Tobin's Q and ROA indices measure firm performance. The study uses FEM with Robust Error correction to overcome the variable variance to estimate the regression model. The results show that dual and female members of BOD affect performance positively, while non-executive BOD members hurt performance. However, the size and percentage of capital owned by BOD's members have not affected the firms' performance.

Nguyen and Do (2020) have examined the relationship between board characteristics and the financial performance of banks in Vietnam. Their findings show the positive effects of board size, board members' educations and the percentage of non-executive directors on ROA and ROE of Vietnamese commercial joint-stock banks.

In conclusion, by examining the relevant empirical studies summarily, the author finds that most studies focus on estimating the effects of BOD's characteristics on the performance of firms and commercial banks. These characteristics include gender, nationality, ethnicity, CEO diversity, occupational diversity, academic education, legal environment, age of female BOD members, job position of female BOD members, CEO diversity, the board size, CEO duality, management style, and percentage of capital owned by the BOD. However, those studies are conducted in the absence of another characteristic of BOD, namely ownership structure and macro-economic variables, so the author modifies the research model by adding these variables.

2.3. Board of director characteristics affect bank performance and hypothesis development

2.4.1. Size of the board of directors

Berle and Means (1932), Lipton and Lorsch (1992) and M. C. Jensen (1993) mention that board size stems from agency theory. Based on this theory, Fama (1980) argues that BOD is essential for monitoring, supervising, and coordinating with managers, while board size is critical for checking managers' activities. The size of BOD also influences the company's long-term performance based on agency theory (Fama & Jensen, 1983) and resource dependency theory.

Moreover, M. C. Jensen (1993) emphasize that a smaller board size leads to cost-cutting and downsizing because of technological and organizational development. Similarly, Hermalin and Weisbach (2003) point out that a large board size may be less effective than a small one. Hence, the number of directors on the board should be limited to seven or eight, or it could be difficult for the CEO to control the board (Lipton & Lorsch, 1992). A large board size could also lead to less meaningful discussion, because expressing opinions in a large group is time-consuming and complicated and frequently leads to a lack of board cohesion (Lipton & Lorsch, 1992). Furthermore, the difficulties of coordination outweigh the benefits of having more directors (M. C. Jensen, 1993). The board must be large enough to meet the requirements of the business. However, it should not be so large that it becomes unmanageable (Hermalin & Weisbach, 2003; Johnstone, 2019)

From empirical studies, there are two opposing views on the effects of board size on bank performance. Lipton and Lorsch (1992), M. C. Jensen (1993), Yermack (1996), Eisenberg et al. (1998), Bhagat and Black (2002) and Phan (2012) confirm that board size affects banks' performance negatively. In contrast, Coles et al. (2008), Cheng et al. (2008), Alonso and Vallelado (2008), Belkhir (2009), Guest (2009) and OConnell and Cramer (2010) have different conclusions on the above relationship that shows the larger board size, the better the performance of the organization.

Most studies define board size as "the total number of directors on the proxy statement date" (Larmou & Vafeas, 2010). Based on the discussions, the following hypothesis is proposed.

Hypothesis 1: board size affects commercial banks' performance.

2.4.2. Gender diversity

Based on the stakeholder theory, Hillman et al. (2001) claim that the more diverse the BOD, the more opportunities to increase company value and achieve financial goals. One aspect of the diversity of the board of directors is gender diversity. Carter et al. (2003) affirm a significant relationship between female diversity on BOD and firm value. Pathan and Faff (2013), García-Meca et al. (2015) and Mertzanis, Basuony, and Mohamed (2019) show that females on a BOD improve firms' profitability, including banks. Female members have new opinions, approaches and perspectives that improve the firm's value better than boards with homogeneous members (Mateos de Cabo et al., 2012). Thus, the existence of female members and performance is positive and significant in some empirical studies, including Gulamhussen and Santa (2015); Low et al. (2015); García-Meca et al. (2015).

In this study, the proportion of female members of BOD measures gender diversity within the total number of BOD members. Most studies define board size as "the total number of directors on the proxy statement date" (Larmou & Vafeas, 2010). Thus, the following hypothesis is proposed.

Hypothesis 2: gender diversity has a positive effect on commercial banks' performance.

2.4.3. Nationality diversity on BOD

Nationality diversity, measured as the proportion of foreign directors on BOD, is a crucial dimension of board diversity. In the banking sector, the link between performance and nationality diversity is a controversial issue because of the different views on the relationship in empirical studies.

The first point of view has been expressed in Ararat et al. (2010) that nationality diversity positively affects bank performance. Similarly, Liang, Xu and Jiraporn (2013) and Sarhan et al. (2018) argue that foreign directors could implement new technologies and management techniques, leading to better performance. García-Meca et al. (2015) demonstrate that nationality diversity negatively affected bank performance.

However, other opposing views in empirical studies find no relationship between nationality diversity and corporate financial performance (Fernandes et al., 2018). These studies were conducted in the wake of the financial crisis in the US stock market.

In this study, nationality diversity is the proportion of directors from different nationalities to the total number of directors on the board. The proposed hypothesis is as follows.

Hypothesis 3: Nationality diversity on the board of directors affect banks' performance.

2.4.4. Chief executive officer duality

CEO duality occurs when the chairman of the board is also the company's general director (Gill & Mathur, 2011; Rouf, 2011). Based on Boyd (1995), CEO duality reduces the BOD's independence, but the influence of CEO duality on bank performance also gives mixed conclusions. According to agency theory developed by Fama and Jensen (1983), CEO duality of management and control rights impede performance and reduce the board's role in supervising managers. The several empirical studies show that duality hurts bank performance, including Grove et al. (2011), Wang et al. (2012), Duru et al. (2016), Sarkar and Sarkar (2018) and Kapil and Mishra (2019). Hence, CEO duality is negative for bank performance because it raises the possibility that an over-powerful CEO will lead banks into risky strategies and push the banks into poor performance. However, Yermack (1996) and Sanda et al. (2010) argue that the organization operates more effectively when there is a separation between the chairman of BOD and the CEO duality. Practical studies, such as that by Rechner and Dalton (1991), Peni and Vähämaa (2012) lend support for this view.

In Vietnamese joint-stock companies, the chairman of BOD of public companies and other joint-stock companies cannot concurrently be the Director or General Director (Clause 2, Article 156 of the Law of Enterprise 2020-Law No.59/2020/QH14). Thus, the chairman of the BOD is not part of a public company and does not fall into the cases specified at Point b, Clause 1, Article 88 of the Law of Enterprise 2020.

In this paper, CEO duality (Dual) is a dummy variable. If the CEO is assigned as the chairman of the BOD, it takes the value of 0; otherwise, it takes 1. Hence, the proposed hypothesis is as follows.

Hypothesis 4: CEO duality affects banks' performance.

2.4.5. Board of directors with advanced education

According to Bantel and Jackson (1989) and Wiersema and Bantel (1992), CEOs with higher educational attainment process information and accept significant changes within the firm. Some studies show that CEOs with postgraduate degrees are more likely to allocate more resources to the funding of R&D activities, thereby improving the performance of their companies

(Barker & Mueller, 2002; Cannella et al., 2008). Based on the argument of Hilmer (1998), board members with higher qualifications (such as a postgraduate degree) can better provide high levels of intellectual ability, experience, and sound judgment, thereby ensuring the board's effectiveness.

Many researchers believe that board member education is critical to the BOD's ability to perform its governance function (Carpenter & Westphal, 2017). The board of directors' supervisory role can be effectively carried out if its members are well-trained and experienced as supervisors. Board members with skills and knowledge are seen as an essential strategic resource in linking external resources based on the resource dependency theory (Ingley & Van der Walt, 2001).

The effectiveness of the BOD's supervisory and advisory roles is determined by their educational qualifications and work experience, which are expressed in their educational qualifications and work experience (Adams & Ferreira, 2007; Fairchild & Li, 2005; Nicholson & Kiel, 2004). Many studies have discovered a connection between managerial ability and firm performance (Dunphy et al., 1997; Ljungquist, 2007).

In addition, D. D. Nguyen et al. (2015) asserted that executive education creates shareholder wealth in the US banking sector. Similarly, Pereira and Filipe (2015) and King et al. (2016) claim that CEO educational attainment is vital for bank performance in terms of quantity and quality. Another study by Fernandes et al. (2017) and Gande and Kalpathy (2017) discovered that having a CEO with a Master of Business Administration degree from a top 20 business school improves a bank's performance.

From the above discussions, BOD members should have advanced education, which positively reflects on the banks' performance. In this paper, the number of members holding a master's degree or a doctorate is divided by the number of council members, which is a proxy for the educational qualification of board members. To confirm, the proposed hypothesis is as follows:

Hypothesis 5: BOD with advanced education affects commercial banks' performance positively.

2.4.6. *Independent director*

The independent member of a BOD can limit the level of information asymmetry, which increases the transparency of the financial reporting (Allini et al., 2016). Shawtari et al. (2017); Shukla et al. (2020) defines an independent board member as someone who does not have an ownership interest and no right in managerial affairs in the company.

Some studies have determined the relationship between independent directors and firm performance. Lefort and Urzúa (2008) find that the more the proportion of independent directors increases, the more firm value is added. Klein (1998) and Hermalin and Weisbach (2003) emphasize that the above relationship is negative, while Y. Liu et al. (2015) find the relationship to be positive. However, Bhagat and Black (2002) and Mohapatra (2016) prove that independent directors do not affect bank performance.

In this paper, independent directors are measured by the numbers of non-executive directors to the total number of BOD (Shawtari et al., 2017; Shukla et al., 2020). Hence, the proposed hypothesis is as follows:

Hypothesis 6: the independent director affects banks' performance.

2.4.7. Ownership concentration

Regarding ownership concentration, owners use their power to control and supervise managers directly through their voting rights (David et al., 2007). Based on the resource dependency theory, owners can use their resources to support and enhance the firm's performance (Carney & Gedajlovic, 2001; Morris, 2007; Pettigrew, 1992; Weidenbaum & Hughes, 1996). Alimehmeti and Paletta (2012) show the positive relationship between ownership concentration and firm value, confirming the agent's perspective that higher concentration increases shareholder power and control, aligning managers and shareholders' interests and consequently increasing firm value. Shleifer and Vishny (1986) and Zeitun (2014) agree that ownership concentration has a positive and significant effect on firm performance. However, these owners can benefit from some advantages, such as transferring resources to other companies that they own (Djankov et al., 2008). They can also engage in disadvantageous transactions that aim to reduce value for non-controlling shareholders (Johnson et al., 2000); and increase compensation for a CEO under their power with a large percentage of shares. According to Demsetz and Villalonga (2001); Morck et al. (1988); McConnell and Servaes (1990), some evidence asserts the effects of ownership concentration on performance are neutral. It depends on how many percentage owners set up the voting rights, which leads to insufficient control to take advantage of governance or other minority-disadvantageous strategies in the company.

In this paper, the proportion of shares owned by shareholders who hold at least 5 per cent of shares outstanding is an index of the ownership concentration (Zeitun, 2014). Hence, the proposed hypothesis is as follows:

Hypothesis 7: ownership concentration affects banks' performance.

2.4.8. Government ownership

Based on agency theory, Li (1994) confirms the Ownership Structure effect. Li (1994) highlights government-linked enterprises having less incentive to control agency problems because they have weaker accountability for financial performance, easier access to financing, lack of exposure to a market for corporate control and weaker monitoring by shareholders.

Meanwhile, Zeitun (2014) argues that government ownership in companies provides better protection and more opportunities to earn profits. Micco et al. (2007) and Iannotta, Iannotta et al. (2007) find the negative effect of government ownership on firm performance. A comparison of bank performances shows that government-owned banks have less efficiency than privately-owned banks (Iannotta et al., 2007). Son et al. (2015) support the findings of previous studies and conduct a study in Vietnam with a significant negative relationship between bank performance and government ownership. Hence, the proposed hypothesis is as follows:

Hypothesis 8: government ownership affects bank performance.

3. Research methodology

3.1. Data collection and sampling

At the beginning of 2020, the Vietnamese commercial banking system included 4 state-owned commercial banks, 31 joint-stock commercial banks, 9 full-foreign owned banks and 2 joint-venture banks. However, this research only focuses on joint-stock and state-owned commercial banks. Thus, the sample size of the regression model is 35 banks compared with 46 banks in Vietnam. Given that the dataset involves a large number of banks ($N = 35$) and a small number of years ($T = 11$), the Arellano-Bond estimation is also suitable for $T < N$. Listed banks are disclosed in Appendix 1. With the secondary data of 35 joint-stock commercial banks for the years 2010 to

2020, the research sample is $35 * 11 = 385$ observations. Because of the availability and transparent information, the number of observations for this study is 376 after eliminating unobtained data. Data for analysis are taken from financial statements and annual reports and websites of banks and the FiinPro database. Macro-economic factors come from the World Bank website (Quoc Trung, 2021a).

3.2. Proposed model

With a dynamic specification, the general equation [1] used in this paper is as follows:

$$\text{bank performance}_{it} = \alpha_0 + \sum \alpha_j \text{board of directors characteristics}_{it} + \sum \alpha_k \text{control factors}_{it} + \sum \alpha_m \text{macro - economic factors}_t + \varepsilon \quad (1)$$

As observed by Hermalin and Weisbach (2003), the key concern of any board structure analysis is the endogeneity of board structure variables. Furthermore, the recent literature on BOD treats the size and structure of boards as endogenous variables (Adams & Ferreira, 2007). Because of the endogeneity problem, pooled OLS, FEM and REM estimates are biased and inconsistent. Therefore, the endogeneity needs to be eliminated by applying Arellano-Bond's two-step SGMM estimation (Arellano & Bond, 1991) with valuable instruments. Hence, from Model (1), the model is modified in detail as follows (Model 2). All factors are measured and described briefly in Table 1.

$$\begin{aligned} \text{tobin_q}_{it} = & \alpha_0 + \alpha_1 \text{tobin_q}_{it-1} + \alpha_2 \text{boardsize}_{it} + \alpha_3 \text{boardfor}_{it} + \alpha_4 \text{gender}_{it} + \\ & \alpha_5 \text{dual}_{it} + \alpha_6 \text{boardedu}_{it} + \alpha_7 \text{independ}_{it} + \alpha_8 \text{govown}_{it} + \alpha_9 \text{owncon}_{it} + \alpha_{10} \text{auditfirm}_{it} + \\ & \alpha_{11} \text{age}_{it} + \alpha_{12} \text{banksiz}_{it} + \alpha_{13} \text{lev}_{it} + \alpha_{14} \text{gdp}_t + \alpha_{15} \text{inf}_t + \varepsilon \end{aligned} \quad (2)$$

3.3. Methodology

The size and structure of the BOD are treated as endogenous variables in recent literature on BOD (Adams & Ferreira, 2007). Thus, Pathan et al. (2008) argue that empirical studies on board composition and performance suffer from endogeneity issues that come in part from the nature of the variables used in such studies. Hence, in the studies by Hermalin and Weisbach (2003), Adams et al. (2010), and Carter et al. (2010), they use an instrumental variable in the two-stage least-squares (IV/2SLS) specification to deal with potential endogeneity.

However, to eliminate the endogeneity in this paper, in addition to using the two-stage least-squares approach, the author conducts the Arellano-Bond two-step SGMM estimation with robust standard errors (Arellano & Bond, 1991), which was adopted and developed by Blundell and Bond (1998) because this method has an advantage in identifying the strong instrument variables to solve the endogeneity. The Arellano Bond estimation combines the lags of the dependent variables (ltobin_q) as instruments. The number of instruments is always kept below the number of groups in all our SGMM specifications (Roodman, 2009). AR(1) and AR(2) are the Arellano-Bond tests for first- and second-order autocorrelations of residuals. The rule of thumb reveals that it is recommended to reject the null hypothesis of no first-order serial correlation and not reject the null hypothesis of no second-order serial correlation of the residuals. As a result, the AR(2) errors test shows that the endogeneity problem is solved at the AR(2) level.

According to the Sargan test statistics, the null hypothesis "over-identifying restrictions are valid" cannot be rejected to ensure the model is well-specified, which show that the instruments are uncorrelated with the errors, or the variables are not omitted in the model.

In summary, an efficient two-step SGMM estimation with Sargan and Arellano-Bond tests is applied for obtaining reliable and unbiased results in small samples (Quoc Trung, 2021a). Finally, the significant Sargan p-values and Hansen p-values must be tested for the endogeneity to be solved, and the model specifications are valid.

Table 1. Variables in model				
Dependent variables	Variables	Index	Formula/ source data	Related research
<i>bankperformance</i>	Tobin's_q	tobin_q	Performance of bank <i>i</i> at time <i>t</i> .	Sadeghi et al. (2009), Rostami (2015)
Independent variables				
Board of directors characteristics	BOD size	boardsize	Total number of directors on the bank's board	Alonso and Vallelado (2008), Belkhir (2009), Bhagat and Black (2002), Cheng et al. (2008), Coles et al. (2008), Eisenberg et al. (1998), Guest (2009), M. C. Jensen (1993), Klein (1998), Larmou and Vafeas (2010), Lipton and Lorsch (1992), O'Connell and Cramer (2010), Phan (2012), Yermack (1996)
	BOD foreign	boardfor	The proportion of directors from different nationalities to the total number of directors in BOD	Ararat et al. (2010), Fernandes et al. (2018), Garcia-Meca et al. (2015), Liang et al. (2013), Sarhan et al. (2018)
	BOD female	gender	The proportion of female members of the BOD in the total number of BOD members	Carter et al. (2003), Pathan and Faff (2013), Garcia-Meca et al. (2015), Gulamhussen and Santa (2015), Low et al. (2015), Mertzanis et al. (2019)
	CEO duality	dual	Dummy variable. Where CEO is assigned as chairman of BOD, it will take the value of 0, otherwise is 1	Rechner and Dalton (1991), Yermack (1996), Sanda et al. (2010), Grove et al. (2011), Wang et al. (2012), Duru et al. (2016), Sarkar and Sarkar (2018), Kapil and Mishra (2019).
	BOD education	boardedu	The number of members holding a master's degree, or a doctorate is divided by the number of council members is the proxy of the educational qualification of board members	Bantel and Jackson (1989), Wiersema and Bantel (1992), Cannella et al. (2008), Barker and Mueller (2002), Nicholson and Kiel (2004), Fairchild and Li (2005), Adams and Ferreira (2007), D. D. Nguyen et al. (2015), Pereira and Filipe (2015), King et al. (2016), Gande and Kalpathy (2017), Ljungquist (2007), Fernandes et al. (2017)
	BOD independence	independ	The number of non-executive directors to the total members of BOD	Klein (1998), Lefort and Urzúa (2008), Y. Liu et al. (2015), Shawtari et al. (2017); Shukla et al. (2020)
	Government ownership	govown	govown = 0 if bank is state-owned commercial bank; govown = 1 otherwise	Micco et al. (2007), Iannotta et al. (2007), Zeitun (2014), Son et al. (2015)
	Ownership concentration	owncon	Proportion of shares owned by shareholders who hold at least 5 per cent of shares outstanding	Demsetz and Villalonga (2001), Morck et al. (1988), McConnell and Servaes (1990), Alimehmeti and Paletta (2012), Zeitun (2014)

(Continued)

Table 1. (Continued)

Variables			Index	Formula/ source data	Related research
Dependent variables					
Control factors	Audit firm type		auditfirm	audit firm = 1 if Big 4, audit firm = 0 otherwise	Mitton (2002), Hanim et al. (2005), Iatridis (2011), C. Liu et al. (2012), Bouaziz and Triki (2012), Farouk and Hassan (2014), Lee et al. (2017)
	Bank age		age	Length of time that a company has existed	Athanasoglou et al. (2008), Stierwald (2009), Halil and Hassan (2012), Tan and Floros (2012), Dogan (2013), Mehari and Aemiro (2013), Tan (2016), Gupta and Mahakud (2020)
	Bank size		banksize	Ln(total assets)	AL-Omar and AL-Mutairi (2008), Kosak and Cok (2008), Alper and Anbar (2011), Gul et al. (2011), Masood and Ashraf (2012), Acaravci and Çalim (2013), Petria et al. (2015), Chowdhury and Rasid (2015), Singh and Sharma (2016), Bougatef (2017).
	Leverage ratio		lev	Total liabilities/Owner's equity	Booth et al. (2001), Onoalapa and Kajola (2010), Salim and Yadav (2012), Iavorskyi (2013).
Macroeconomic factors	GDP growth rate		gdp	World Bank	Sufian and Habibullah (2010), Emase (2017), Tahsin and Gülşah (2018), Matar et al. (2018).
	Inflation rate		inf		J. Boyd and Smith (1998), Guru et al. (2002), Jiang et al. (2003), John H. Boyd and Champ (2006), Fadzan and Kahazanh (2009), Tinoco-Zermeño et al. (2018), Gilbert and Jaya (2019), Cetin (2019), Mbabize et al. (2020), Almansour et al. (2021).
Instrument factors	ltobin_q		tobin_q _{it-1}	Performance of bank i at time t-1.	Arellano and Bond (1991)

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
tobinq	376	0.749	0.331	0.140	1.810
boardsize	376	7.188	1.757	3.000	15.000
boardfor	376	0.086	0.120	0.000	0.440
gender	376	0.187	0.160	0.000	0.710
dual	376	0.636	0.482	0.000	1.000
boardedu	376	0.455	0.281	0.000	1.000
independ	376	0.845	0.150	0.000	1.000
govown	376	0.351	0.478	0.000	1.000
owncon	376	0.302	0.306	0.000	1.000
audit firm	376	0.827	0.379	0.000	1.000
age	376	22.011	10.813	1.000	63.000
banksiz	376	31.717	2.961	15.350	35.010
lev	376	11.914	4.985	3.190	37.150
gdp	376	0.058	0.011	0.030	0.070
inf	376	0.061	0.046	0.010	0.190

4. Model analysis and discussion

4.1. Model analysis

[Table 2](#) presents the descriptive statistics for all factors in model. The mean value of Tobin's Q is 0.749 with a standard deviation of 0.331. Its maximum and minimum values are 1.810 and 0.140, respectively.

Concerning the board size factor, its maximum and minimum values are 15 and 3, respectively. These results mean that the minimum number of members on BOD is 3. In 2011, the Global Petro Sole Member Limited Commercial Bank (GPBANK) had 3 BOD members, while the maximum board size is 15. Viet Capital Commercial Joint Stock Bank (BVB) had this number of BOD members in 2015.

Dummy variables are included for other measurements, such as dual, boardedu, govown and audit firm. These variables have a maximum value is 1 and a minimum value of 0. However, a differential value could be found in the mean of two factors, such as dual and audit firm, which had a mean value over 0.5, indicating that the proportion of banks that have the chairman taking the director's position is 63.6%. To ensure the quality of disclosed information, over 80% of banks choose a Big 4 company to perform the audit services. Two remaining factors, namely boardedu and govown, which represent the level of postgraduate education of members in BOD and the percentage of government ownership in the banks, had values of 45.5% and 35.1%, respectively.

Regarding the diversity of BOD, such as the foreign nationality, it has a mean proportion of 8.6% and gender diversity of 18.7%. The number of independent members in BOD will be in the range of 0 to 1. The maximum value means the BOD will hire and assign an outside agent to be a CEO.

The bank age factor has maximum and minimum values of 63 and 1, respectively. While the bank size factor has a mean value of 31.717. Its maximum value and the minimum value are in the order of 35.010 and 15.350, respectively.

In addition, the maximum and minimum values of the leverage factor are in the order of 37.150 and 3.190, respectively. The highest value of leverage belongs to Saigon Commercial Joint Stock Bank (SCB) in 2020 and Saigon Bank for Industry and Trade (SGB) had the lowest leverage in 2013.

For macro-economic factors, the maximum value of GDP is 0.07, with a standard deviation of 0.011. Its minimum value is 0.03. The maximum value of inflation is 0.19, with a standard deviation of 0.046. Its minimum value is 0.01.

The next section presents the test of multi-collinear phenomenon, autocorrelation and heteroskedasticity after running the OLS between Tobin_q (dependent variable) and all independent variables. The regression results are shown in Appendix 2.

Hair et al. (1995) demonstrated that a VIF coefficient of less than 10 is acceptable. As a rule, if a VIF value exceeds 10, it means the estimated regression coefficients are underestimated because of the multicollinearity phenomenon (Montgomery et al., 2001; Quoc Trung, 2021a). Likewise, when VIF values are less than 5, it confirms that multicollinearity does not exist in the model (Jermakowicz et al., 2007; Taurigana & Arfifa, 2013). According to Table 3, all VIF coefficients of variables are smaller than 10. Thus, there is evidence of the absence of multicollinearity phenomenon.

According to the results of the correlation coefficient matrix (Table 4), after removing the variables that have correlation coefficients greater than 0.8 and the remaining correlation coefficients are all less than 0.8, the model has no defects of multicollinearity phenomenon (Quoc Trung, 2021a). The results are consistent with Taurigana and Arfifa (2013), who confirmed that the multicollinearity problem does not exist if the correlation coefficient is less than 0.80 or 0.90.

The tests for autocorrelation and heteroscedasticity will be used to support the claim that the residuals are independent of each other, and no systematic change occurred in the spread of the residuals over the range of measured values (Table 5).

Regarding the Wooldridge test for autocorrelation in panel data, the p-value is smaller than 5%, and thus, we have enough evidence to reject H_0 : "There is no autocorrelation". It means the model

Table 3. Test of the multi-collinear phenomenon

Variable	VIF	1/VIF
banksize	1.86	0.539
independ	1.85	0.541
dual	1.72	0.583
age	1.55	0.647
govown	1.48	0.675
lev	1.43	0.700
boardfor	1.35	0.739
audit firm	1.33	0.749
boardedu	1.30	0.770
owncon	1.27	0.786
boardsize	1.27	0.787
inf	1.15	0.868
gender	1.14	0.874
gdp	1.03	0.974
Mean VIF	1.41	

Table 4. Correlation matrix

	tobinq	boardsize	boardfor	gender	dual	boardedu	independ	govown	audit firm	age	banksize	lev	gdp	inf	owncon
tobinq	1														
boardsize	0.055	1													
boardfor	-0.003	0.247	1												
gender	-0.038	-0.124	-0.125	1											
dual	0.013	0.127	-0.180	-0.002	1										
boardedu	-0.062	0.067	0.031	0.071	0.136	1									
independ	0.097	0.027	0.072	-0.134	-0.574	-0.005	1								
govown	0.128	0.182	-0.139	-0.005	0.117	0.266	0.038	1							
audit firm	0.003	0.296	0.311	-0.184	0.034	-0.023	0.064	0.130	1						
age	-0.031	0.219	-0.032	-0.014	0.243	0.295	-0.174	0.324	0.127	1					
banksize	0.026	0.290	0.181	-0.180	0.268	0.134	-0.319	0.206	0.334	0.447	1				
lev	-0.133	0.196	-0.010	0.025	0.088	0.225	0.005	0.032	0.183	0.344	0.375	1			
gdp	-0.012	0.003	-0.032	0.002	0.057	0.040	-0.035	-0.032	0.012	0.027	0.023	0.107	1		
inf	0.150	-0.017	0.038	-0.054	-0.084	-0.150	0.088	0.118	-0.009	-0.201	-0.110	-0.237	-0.123	1	
owncon	0.023	0.121	-0.003	-0.050	0.084	0.319	-0.039	0.359	0.059	0.266	0.187	0.188	0.028	-0.012	1

Table 5. Test of autocorrelation and heteroskedasticity

No.	Test	F-statistic	p-values	H ₀
1	Wooldridge test for autocorrelation in panel data	5.023	0.0316	Reject
2	Breusch-Pagan /Cook-Weisberg test for heteroskedasticity	15.01	0.0001	Reject

contains the autocorrelation problem. Furthermore, the p-value of variance change test (Breusch-Pagan/ Cook-Weisberg test) has a value smaller than 5%, and thus, H₀: “Residuals with variance unchanged” has sufficient evidence to be rejected. Therefore, the heteroskedasticity phenomenon does not exist (Appendix 2).

As mentioned above, the SGMM model will be used in the estimation with instrument variables. According to Arellano and Bond (1991), the autocorrelation phenomena between the lag of dependent variable and error can be fixed by adding instrument variables into the dynamic panel data (Quoc Trung, 2021a).

The author uses the Arellano and Bond tests to check the condition of no correlation in the error term. The AR(2) error test is rejected in the Arellano-Bond model because p-value = 0.462 (Table 6) is larger than 0.05 with the null hypothesis (H₀): “Autocorrelation does not exist”. This result means that the probability of AR(2) is insignificant at 5%. Thus, the absence of serial autocorrelation in the errors can be confirmed in the model (Quoc Trung, 2021a).

The following section discusses the Sargan and Hansen tests (Table 6), which aim to detect an overidentifying restriction problem related to the heterogeneity of the subsets of the instrumental variables and support the validity and reliability of the SGMM 2-step results. In this model, the p-value in the Sargan test (under the “H₀: overidentifying restrictions are valid” hypothesis) is large (p-value = 0.243). Therefore, no sufficient evidence could be found to reject hypothesis H₀.

Roodman (2009) discussed the good practices in implementing the SGMM estimation and applying the difference-in-Hansen test to the subsets of SGMM-type instruments and standard instrumental variables for the level equation. Appendix 3 also presents the difference in Hansen tests of the exogeneity of instrument subsets under the null hypothesis (H₀) of the joint validity of a given instrument subset. As a result of statistical evidence at 5%, the null hypothesis cannot be rejected. This finding leads to the suggestion that the subsets of instruments are econometrically exogenous. In this paper, the number of instruments is 31, which is less than the number of observations at 35 (Table 6). Therefore, the rule of thumb in Roodman (2009) and Al Marzouqi et al. (2015) is satisfied. Hence, the instrument variables are adequate to deal with the endogeneity (Quoc Trung, 2021a).

4.2. Discussion

The findings show nine statistically significant variables at 5%, including lagged bank performance, BOD characteristics, audit firm type, leverage ratio and inflation rate. BOD characteristics include board size, nationality of BOD, BOD advanced education, government ownership and ownership concentration. These BOD characteristics have a positive effect on bank performance, while audit firm type, leverage ratio, and inflation rate have a negative effect on bank performance.

First, because the lagged bank performance has a coefficient larger than 0 (1.019), it positively affects bank performance. When the last bank performance increases by one unit, the current

Table 6. Results of two-step system GMM

tobinq	Coef.	P > z
ltobinq	1.019	0.000***
boardsize	0.063	0.002**
boardfor	6.041	0.000***
gender	0.497	0.296
dual	0.175	0.489
boardedu	2.837	0.001***
independ	-0.004	0.899
govown	1.507	0.000***
owncon	0.148	0.042*
audit firm	-2.519	0.030*
age	0.033	0.480
banksize	-1.220	0.317
lev	-1.823	0.023*
gdp	0.049	0.874
inf	-1.132	0.000***
_cons	0.083	0.959

legend: * $p < .05$; ** $p < .01$; *** $p < .001$

Arellano-Bond test for AR(1) in first differences: $z = -1.70$ $Pr > z = 0.089$

Arellano-Bond test for AR(2) in first differences: $z = -0.74$ $Pr > z = 0.462$

Number of instruments = 31

Number of groups = 35

ltobinq is the lag one year of bank performance; board size is total number of directors on the bank's board; board for is the proportion of directors from different nationalities to the total number of directors in BOD; gender is the proportion of female members of the BOD in the total number of BOD members; dual is a CEO the assigned as chairman of BOD; boardedu is the number of members holding a master's degree, or a doctorate; independent is the number of non-executive directors; govown is government ownership; owncon is ownership concentration; audit firm is audit firm type; age is bank age; bank size is bank size; lev is leverage ratio; GDP is growth domestic products; inf is the inflation rate.

bank performance in Vietnam will rise 1.019 units. This factor is considered as an instrument variable to deal with the endogeneity in the model to obtain unbiased and reliable results.

Second, the following characteristics of BOD are statistically significant variables and affect bank performance positively.

Concretely, board size has a coefficient larger than 0 (0.063), and thus, it positively affects the bank performance. Other factors remain constant. Meanwhile, when board size increases by one unit, bank performance rises by 0.063 units. It means that a board with a large number of directors is supported by the agency and resource dependency theories. This result is consistent with previous findings, including that of Klein (1998), Coles et al. (2008), Cheng et al. (2008), Alonso and Vallelado (2008), Belkhir (2009), Guest (2009) and OConnell and Cramer (2010), who reached a different conclusion of the above relationship. They argue that the larger the board in the bank, the better its performance. Because large board size can better support and advise the CEO in making his/her proactive decisions. This argument is in accordance with that of C. M. Dalton and Dalton (2005), who argued that large boards may be beneficial because they expand the pool of expertise and resources available to the organization. The agency and resource dependency theories support the findings of this study. Regarding agency theory, the BOD monitors and controls the managers' performance and activities as representatives of the company's related parties. A larger BOD has a larger number of directors who work to protect stakeholders' interests

by monitoring and controlling the bank's performance. The latter theory further suggests that a larger board will bring greater diversity of expertise and knowledge in various fields. As a result, different directors have access to different resources, and as the number of these directors grows, resource availability also grows, thereby improving firm performance. The resource dependency theory and the agency theory, when combined, indicate the existence of a positive relationship between board size and firm performance, which favour large boards. Furthermore, a large board size means organizations have a more diverse and valuable information system, which assist BOD in making their proactive decisions.

The factor of national diversity in BOD has a coefficient larger than 0 (6.041), which indicates that it positively affects bank performance. Other factors remain constant, when national diversity in BOD increases one unit, the bank performance increases by 6.041 units. The findings of this study are supported by Ararat et al. (2010), Liang et al. (2013) and Sarhan et al. (2018). The existence of foreign directors could implement new technologies and management techniques, leading to better performance. Furthermore, they can apply global standards for commercial banks' systems to the practices for achieving oriented profits, as well as developing strategies and applying innovative techniques in risk measurement and prevention (for instance, Basel).

Advanced education of BOD affects bank performance positively because its coefficient is larger than 0 (2.837). Other factors remain constant when advanced education of BOD increases one unit, bank performance rises by 2.837 units. This result is consistent with that of Bantel and Jackson (1989), Wiersema and Bantel (1992), Cannella et al. (2008), Barker and Mueller (2002), Nicholson and Kiel (2004), Fairchild and Li (2005), Adams and Ferreira (2007), D. D. Nguyen et al. (2015), Pereira and Filipe (2015), King et al. (2016), Fernandes et al. (2017) and Gande and Kalpathy (2017). These studies found that CEOs with higher educational attainments are better able to process information and accept significant changes within the firm.

Two other factors, namely, government ownership and ownership concentration, positively affect bank performance. The regression in Table 6 indicates that their coefficients are 1.507 and 0.148, respectively, which are larger than 0. Regarding the first factor, the research result is consistent with Zeitun (2014) but is the opposite of that of Micco et al. (2007), and Son et al. (2015), which agree on the significantly negative effect of government ownership on bank performance. The author conducts the research in the commercial banking system of Vietnam, a developing economy wherein the commercial banking system is the backbone of the economy. Hence, the government needs to have strict management, regulation, and control to ensure that the system works effectively and avoids systemic risks that could affect the development of the economy.

Other factors remain constant, when government ownership increases one unit, bank performance rises by 1.507 units. The correlation between government ownership and performance in the Vietnamese commercial banking system implies that banks owned by the government are more profitable than private banks because government banks are considered a safer place to store deposits than private banks.

In terms of ownership concentration, this factor affects bank performance positively at a 5% significance, indicating its beneficial effect on bank performance (indexed by Tobin's Q). Other factors remain constant, when ownership concentration increases one unit, bank performance rises 0.148 units. The findings match the proposed hypothesis and are consistent with Alimehmeti and Paletta (2012) and Zeitun (2014). Bank performance is the most concerning for large shareholders that hold a large proportion of shares in banks. Hence, they will use their voting rights to control and supervise the banks' activities and strategic orientation.

Third, audit firm type is a statistically significant variable with a negative coefficient (−2.519) that negatively affects bank performance. This finding is contrary to the proposed hypothesis and some studies, including Mitton (2002), Hanim et al. (2005), Bouaziz and Triki (2012), and Farouk and

Hassan (2014). However, it is in accordance with Lee et al. (2017), who conducted their study during the crisis period. The results indicate an inverse relationship between audit firm type and Tobin's Q. According to the Auditing Standards and Practice Guidance, auditors, particularly Big 4 auditors, must ensure a detailed process and take a series of stringent regulatory actions. As a result, some small banks in Vietnam tend to use the audit services of the Big 4 to create shareholder and investor confidence in the financial statements' reliability. However, their value was reduced after the bank's financial statements were audited and published. Therefore, these small banks use Big 4 until the resources have been financed fully during the first period, and right after they change into non-Big 4 to improve their performance after audit services.

Fourth, another control variable that also affects bank performance in Vietnam is leverage. Leverage ratio indicates an optimal capital structure, indicating that banks have equity ratios and creditors. As shown in the regression results, the negative correlation coefficient (−1.823) between the above variables confirms that the level of leverage is found to be an adverse driver of Vietnamese banks' performance in terms of Tobin's Q. Findings also show that a bank's leverage is a significant determinant of its performance. According to the obtained results, the finding is the same as the suggested hypothesis and is consistent with Booth et al. (2001), Onaolapo and Kajola (2010), Salim and Yadav (2012) and Iavorskyi (2013).

- (1) *Finally*, inflation is a statistically significant factor that negatively affects bank performance. This result agrees with J. Boyd and Smith (1998), John H. Boyd and Champ (2006), Cetin (2019), and Mbabazize et al. (2020), who conducted similar studies and confirmed the reverse relationship between inflation and banks' performance. Some studies on credit markets discovered that rising inflation has a negative effect on credit market frictions, resulting in lower financial sector performance and lower long-run real activity (Huybens & Smith, 1999). An increase in the inflation rate diminishes the real rate of return on assets. The implied reduction in real returns exacerbates credit market frictions. Hence, the financial sector makes fewer loans, resource allocation is less efficient, and intermediary activity decreases, which hurts capital investment. Reduced capital formation has a negative effect on long-term economic performance and equity market activity, which trades claims to capital ownership (J. Boyd & Smith, 1998; Huybens & Smith, 1999).

5. Conclusions and limitations

Based on the quantitative method (SGMM), the study explores the characteristics of the BOD affecting Vietnamese commercial banks' performance from 2010 to 2020, including board size, nationality diversity, and BOD advanced education. The findings demonstrated the statistically significant effect of government ownership and ownership concentration on bank performance. The obtained results showed that members of the BOD are all owners of large shares (ownership concentration) and have government ownership. According to agency theory and resource dependency theory, the larger the number of board members, the more voting rights are exercised through significant shareholders (ownership concentration), the more control from the government (government ownership), and the higher the ability to regulate and dominate the manager. Hence, bank managers can use resources to support their powers in operating activities. Because the Board of Directors is diverse and well-educated, they have stimulated banks to improve their performance by using international practices, improving their internal control systems, and coming up with strategies for the future.

Although the paper highlights the consideration points, the study has some limitations. First, the author has not classified the CEO's qualifications (financial and non-financial fields) to identify and compare the influence of the CEO's fields of expertise on bank performance. At the same time, the paper has not measured the working experience of foreigners in the Vietnam market, and thus, data on foreign CEOs' grasp of the domestic market are limited. Finally, the indicator of bank performance can also change from Tobin's Q to other indicators, such as net interest margin or economic value added to represent bank performance from a different angle.

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APPENDIX 1: LIST OF VIETNAMESE COMMERCIAL BANKS LIST OF COMMERCIAL BANKS IN VIETNAM (31/12/2020)

APPENDIX 2 OLS REGRESSION MODEL AND TEST OF AUTOCORRELATION, HETEROSKEDASTICITY

APPENDIX 3: REGRESSION MODEL BY USING SGMM

No.	Code	Name of bank
1	ABB	An Binh Bank
2	ACB	Asia Commercial Bank
3	BAB	Bac A Bank
4	BID	Bank for Investment and Development of Vietnam
5	BVB	Bao Viet Bank
6	CTG	Vietnam Joint Stock Commercial Bank for Industry and Trade
7	EAB	Dong A Commercial Joint Stock Bank
8	EIB	Vietnam Export Import Commercial Joint Stock Bank
9	GDB	Viet Capital Bank
10	HDB	Housing Development Commercial Joint Stock Bank
11	KLB	Kien Long Commercial Joint Stock Bank
12	LPB	Lien Viet Post Joint Stock Commercial Bank
13	MBB	Military Commercial Joint Stock Bank
14	MSB	Vietnam Maritime Commercial Joint Stock Bank
15	NAB	Nam A commercial Joint Stock Bank
16	NVB	National Citizen Bank
17	PGB	Petrolimex Group Commercial Joint Stock Bank
18	PVF	Vietnam Public Joint Stock Commercial Bank
19	SCB	Sai Gon Joint Stock Commercial Bank
20	SEAB	SouthEast Asia Commercial Joint Stock Bank
21	SGB	Saigon bank for industry and trade
22	SHB	Saigon - Ha Noi Commercial Joint Stock Bank
23	STB	Sai Gon Thuong Tin Commercial Joint Stock Bank
24	TCB	Vietnam Technical Commercial Bank
25	TPB	Tienphong commercial Joint Stock Bank
26	VAB	Vietnam Asia Commercial Joint Stock Bank
27	VCB	Joint Stock Commercial Bank for Foreign Trade of Vietnam
28	VIB	Vietnam International Commercial Joint Stock Bank
29	VPB	Vietnam Prosperity Joint Stock Commercial Bank
30	OCB	Orient Commercial Joint Stock Bank

(Continued)

(Continued)		
No.	Code	Name of bank
31	VBB	Vietnam Thuong Tin Commercial Joint Stock Bank
32	Agribank	Vietnam Bank for Agriculture and Rural Development
33	GP Bank	Global Petro Commercial Joint Stock Bank
34	Ocean	Ocean Commercial One Member Limited Liability Bank
35	Construction	Vietnam Construction Bank

Source	SS	df	MS	Number of obs	=	376
Model	3.18903698	14	.227788356	F(14, 361)	=	2.17
Residual	37.9218986	361	.10504681	Prob > F	=	0.0086
				R-squared	=	0.0776
				Adj R-squared	=	0.0418
Total	41.1109356	375	.109629162	Root MSE	=	.32411

tobinq	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
boardsize	.0070435	.0106973	0.66	0.511	-.0139934	.0280804
boardfor	-.0100434	.1625448	-0.06	0.951	-.3296971	.3096103
gender	.0488064	.1119717	0.44	0.663	-.1713924	.2690052
dual	.0741109	.0454994	1.63	0.104	-.0153662	.1635881
boardedu	-.0880591	.0677874	-1.30	0.195	-.2213668	.0452487
independ	.4237629	.1514647	2.80	0.005	.1258989	.7216269
govown	.0657138	.0426305	1.54	0.124	-.0181215	.1495491
auditfirm	-.0410246	.0510685	-0.80	0.422	-.1414537	.0594045
age	-.0008866	.0019249	-0.46	0.645	-.0046719	.0028987
banksiz	.0151384	.0076995	1.97	0.050	-3.13e-06	.03028
lev	-.0098215	.0038768	-2.53	0.012	-.0174455	-.0021975
gdp	.5840022	1.488325	0.39	0.695	-2.342873	3.510878
inf	.69575	.3883843	1.79	0.074	-.0680298	1.45953
owncon	.0239958	.0616512	0.39	0.697	-.0972447	.1452363
_cons	-.0956231	.309667	-0.31	0.758	-.7046009	.5133547

Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

F(1, 34) = 5.023
 Prob > F = 0.0316

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of tobinq

chi2(1) = 15.01
 Prob > chi2 = 0.0001

Dynamic panel-data estimation, two-step system GMM

Group variable: BANK	Number of obs	=	343
Time variable : year	Number of groups	=	35
Number of instruments = 31	Obs per group: min	=	6
Wald chi2(15) = 1341.98	avg	=	9.80
Prob > chi2 = 0.000	max	=	11

tobing	Coef.	Corrected Std. Err.	z	P> z	[95% Conf. Interval]	
ltobing	1.019119	.1687724	6.04	0.000	.688331	1.349907
boardsize	.0630562	.0199138	3.17	0.002	.0240258	.1020866
boardfor	6.040597	.5644861	10.70	0.000	4.934225	7.14697
gender	.4972446	.4761412	1.04	0.296	-.435975	1.430464
dual	.1746902	.2527278	0.69	0.489	-.3206472	.6700275
boardedu	2.836842	.8190642	3.46	0.001	1.231506	4.442178
independ	-.004193	.0331003	-0.13	0.899	-.0690685	.0606825
govown	1.50716	.4290093	3.51	0.000	.666317	2.348003
owncon	.1484266	.0729679	2.03	0.042	.0054122	.291441
auditfirm	-2.519292	1.16297	-2.17	0.030	-4.798671	-.2399132
age	.0333209	.0471723	0.71	0.480	-.0591351	.1257768
banksz	-1.220422	1.22035	-1.00	0.317	-3.612264	1.171421
lev	-1.822685	.8027987	-2.27	0.023	-3.396141	-.2492282
gdp	.0491543	.3102821	0.16	0.874	-.5589874	.657296
inf	-1.131974	.2944963	-3.84	0.000	-1.709176	-.5547717
_cons	.0832679	1.604348	0.05	0.959	-3.061197	3.227733

Instruments for first differences equation

Standard

D.boardedu
D.gender
D.boardsize
D.dual

GMM-type (missing=0, separate instruments for each period unless collapsed)
L3.(L.inf L2.gdp)

Instruments for levels equation

Standard

boardedu
gender
boardsize
dual
_cons

GMM-type (missing=0, separate instruments for each period unless collapsed)
DL2.(L.inf L2.gdp)

Arellano-Bond test for AR(1) in first differences: z = -1.70 Pr > z = 0.089
Arellano-Bond test for AR(2) in first differences: z = -0.74 Pr > z = 0.462

Sargan test of overid. restrictions: chi2(15) = 18.39 Prob > chi2 = 0.243
(Not robust, but not weakened by many instruments.)
Hansen test of overid. restrictions: chi2(15) = 3.52 Prob > chi2 = 0.999
(Robust, but weakened by many instruments.)

Difference-in-Hansen tests of exogeneity of instrument subsets:

GMM instruments for levels

Hansen test excluding group: chi2(2) = 0.54 Prob > chi2 = 0.763
Difference (null H = exogenous): chi2(13) = 2.98 Prob > chi2 = 0.998

iv(dual)

Hansen test excluding group: chi2(14) = 3.04 Prob > chi2 = 0.999
Difference (null H = exogenous): chi2(1) = 0.48 Prob > chi2 = 0.490

iv(boardsize)

Hansen test excluding group: chi2(14) = 2.94 Prob > chi2 = 0.999
Difference (null H = exogenous): chi2(1) = 0.58 Prob > chi2 = 0.448

iv(gender)

Hansen test excluding group: chi2(14) = 2.83 Prob > chi2 = 0.999
Difference (null H = exogenous): chi2(1) = 0.69 Prob > chi2 = 0.406

iv(boardedu)

Hansen test excluding group: chi2(14) = 1.11 Prob > chi2 = 1.000
Difference (null H = exogenous): chi2(1) = 2.41 Prob > chi2 = 0.120



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