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Recognizing CEOs and Chairmen's personality and bank performance: new insights from signature analysis

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ABSTRACT

This study first uses graphology to examine the signatures of the CEOs and Chairmen of 26 commercial banks in Vietnam (2007-2020) to predict their personalities following the Big Five Personality model. Such personalities are used as a key explanatory variable to explain bank performance. Our findings extend the entrenchment theory that bank profitability is positively affected by the same personality traits of separate CEOs and Chairmen. More specifically, the findings indicate a positive relationship between bank profitability and conscientious and extraverted CEOs and Chairmen. When observing bank ownership, these two categories of personality traits are more critical to listed banks. As the first attempt to investigate whether separate CEO and chairman with the same characteristics may affect bank performance, our study will add more evidence to the existing literature about the relationship between corporate governance and bank profitability.

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Board structure; CEO; chairman; bank performance; Big Five Personality Model; corporate governance

1. Introduction

Since the global financial crisis of 2007-08, corporate governance mechanisms have gained increased attention from investors, regulators, and academics in the banking sector (Fernandes et al. 2018). Corporate governance is essential for lending institutions in establishing trust and enhancing investors' confidence (Bank for International Settlements 2006).[1] Given that effective corporate governance improves the efficiency of monitoring and supervision, good corporate governance is seen as a key factor that attracts investors. Indeed, one of the main explanations for the failures of high-profile businesses (e.g. Enron, WorldCom, or Global Crossing) is the malfunction of top corporate management. In these cases, public confidence in corporate governance structures and the inability of Boards of Directors (BODs) to supervise and monitor managerial behaviour

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[1]Corporate governance involves the mechanism, rules, and regulations that a company follows to control the interests and conflicts of corporate insiders and outsiders, thereby minimizing the targeting agency costs and maximizing firm value.

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has diminished to extremely low levels. Furthermore, good governance practices require companies to maintain board independence in terms of completely independent compensation and nomination committees or provide conditions in which independent directors predominantly determine director nominees and the remuneration of top management. In any firm's structure, the chairman and Chief Executive Officer (CEO) play critical roles in good governance and financial performance (Wijethilake and Ekanayake 2020). In reality, "the Chair is responsible for running the board, while the CEO is responsible for running the organisation. I often see this confused." said David W Duffy, the CEO of the Corporate Governance Institute.[2] This cultivates researchers and practitioners to answer whether the choice of governance mechanism, either CEO/chairman duality (so-called CEO duality) or distinguishing roles of CEO and chairman, would benefit bank performance.

According to the entrenchment theory[3] argues that agency costs increase because of the reduced ability to supervise the CEO when the CEO is also the Chairman (Fernandes et al. 2017). Several studies have demonstrated that CEO duality may impact firm performance adversely (Grove et al. 2011). This is since the joint responsibilities of the CEO and chairman exercised by the same person may induce ineffective monitoring and control of CEO performance (Bliss 2011; Dalton et al. 2011). In contrast, efficiency theory[4] advocates that firms' economic and business environments determine the structure of board leadership; thus, one person who takes two roles may suit the firms' conditions (Fernandes et al. 2017). In this vein, several studies have indicated the CEO duality's positive effect due to the command chain's unification and integration (Fiador and Sarpong-Kumankoma 2021; Gupta and Mahakud 2020; Hakimi et al. 2018). However, few studies have found no impact of CEO duality on bank performance (Abdul Gafoor, Mariappan, and Thiyagarajan 2018; Bouteska 2020; Fernandes et al. 2017; Morekwa Nyamongo and Temesgen 2013). In general, most of these studies that consider CEO/chairman duality as the same person with identical characteristics or the separation of CEO and chairman provide confounding findings. In practice, separate CEO and chairman in the BOD with the same characteristics/personality traits have existed in many companies' corporate structures. The present study attempts to investigate whether separate CEO and chairman with the same personality traits would affect bank performance. In doing so, our findings, therefore, may extend the entrenchment theory.

Vietnam is considered one of the 'next dragons' in Asia since this country achieved remarkable economic growth with an average annual rate of 6.2% from 2007 to 2020, just behind China within the Asia Pacific region. Despite of significant development of the stock market, the Vietnamese banking system is the backbone of the economy since bank credit is the primary source of funding for the economy (MOF 2021). Stable and sustainable profitability is one of the critical factors in forecasting financial distress and bank crisis (Demirgüç-Kunt and Detragiache 2000). This reflects management quality in terms of efficiency and risk management capacity, bank strategies approved by the board, and shareholder behavior. To achieve the goal of making banks become profitable and

[2]Conmy, S (n.d) *What can a board do when conflict arises between the CEO and the Chair?*, Corporate Governance Institute, https://www.thecorporategovernanceinstitute.com/insights/guides/conflict-between-the-ceo-and-the-chair-steve-jobs-fired-by-board-at-apple/>.

[3]This is comparable with the view of the agency theory (Grove et al. 2011).

[4]This is comparable with view of the stewardship theory (Hakimi et al. 2018).

market-functioning institutions, the State Bank of Vietnam (SBV) introduced several reforms in terms of corporate governance. More specifically, the SBV provides guidelines and regulations for the structure and operation mechanism of the board of directors (BOD). Given the critical roles of CEOs and chairmen for bank strategies and the essential roles of banks in the Vietnamese economy, the appointment and dismissal of the chairman and CEO in commercial banks must be approved by the SBV. Also, Decree No.59/2009/ND-CP approved by the Vietnamese government, demonstrated that CEO duality in the Vietnamese banking system has been prohibited since July 2009 (The Vietnamese Governement 2009). However, the literature on CEO duality provides mixed findings. This may raise a concern about whether or not separate CEO and Chairmen with same characteristics may enhance bank performance. This is the first attempt to examine this matter using the Vietnamese banking system with its unique setting.

The contributions of our paper to the existing literature are fourfold. First, many studies on CEO and chairman characteristics have exclusively focused on advanced countries such as the US and Europe, where broader marketplaces and a greater number of banks are useful for economic modelling (R. B. Adams and Mehran 2012; Bouteska 2020; Carty and Weiss 2012; Denis and McConnell 2009; Fernandes et al. 2017). However, it is questionable whether the empirical evidence on developed markets accurately represents the true impacts of CEOs' and chairmen's characteristics in other markets. Given the regulatory and economic environments in which banks have operated are different across countries, and the level and quality of services related to deposits and loans are also different among nations, the relationship between CEO and chairmen characteristics and bank performance would also vary. Hence, the evidence of developed markets cannot automatically represent emerging markets in general and the banking system in particular due to significant variations that exist in institutional reality. The evidence of bank corporate governance in emerging markets, particularly the Asia-Pacific region, is even scanty [perhaps, Liang et al. (2013) in China and Abdul Gafoor et al. (2018) in India are the exceptions]. Our study will add more evidence to the existing literature about the association between corporate governance and bank profitability in emerging economies by exploring the characteristics of the CEO and chairman in the Vietnamese banking sector. Second, most prior studies have exclusively investigated the relationship between CEO duality and firm performance, given CEO duality means that CEO and chairman are one person. However, in many cases in practice (e.g. in emerging markets like Vietnam), the CEO and chairman are often separate positions/individuals. Our study is the first attempt to examine whether the same personality traits of separate CEO and chairman would improve bank performance. Therefore, this will add more evidence to the existing corporate-governance literature. Third, there is no study on the link between CEO or chairman characteristics and bank performance. Thus, our study further explores which specific personality traits of separate CEO and chairman would benefit banks according to the Big Five Personality Model. Fourth, we further extend the function of bank ownership that may contribute to the relationship between the characteristics of CEO and chairman and bank performance (SOCBs vs. POCBs, foreign-owned vs. local banks, and listed vs. non-listed banks).

By analyzing the signatures of CEOs and chairmen of 26 Vietnamese commercial banks from 2007 to 2020, the findings show that separate CEO and chairman with the same characteristics are likely to enhance risk-adjusted returns. Therefore, our findings extend

the entrenchment theory that the separation of CEO and chairman is beneficial for firm performance if they are the same personality traits. More specifically, our findings emphasize that only conscientious and extraverted CEO and chairman may improve bank profitability. The same findings are more prevalent in listed banks.

The remainder of this paper is structured as follows. Section 2 indicates a brief overview of the Vietnamese banking system, while Section 3 presents the literature review. Section 4 introduces the methodology and data used in this study. Section 5 discusses the findings, while Section 6 provides the conclusions of the present study.

2. Overview of the vietnamese banking system

The Vietnamese banking system witnessed significant changes since implementing several reforms, notably the 'Doi Moi' or so-called renovation reforms. One-tier system no longer existed, and banks have become more market-and profit-oriented. The banking sector has a much-diversified structure. First, two main players in the banking system include state-owned commercial banks (SOCBs) that have served state-owned enterprises (SOEs) with large branch networks and privately owned commercial banks (POCBs) that have concentrated on serving potential customers in focused areas. Second, two policy banks are seen as a lending arm of SBV for designated socio-political programs. Given the various roles of banks in the economy (Allen and Carletti 2009) and the 1997-98 Asian Financial Crisis, SBV recognized that corporate governance is crucial to help commercial banks to survive, grow and provide capital for the economy. Indeed, well-governed banks are more likely to operate efficiently and manage potential risks better, thus attracting more capital. Therefore, SBV (2001) introduced Decision No.1087/2001/QD-NHNN on regulations and guidelines for the structure and operations of BOD, Board of Supervisors, especially the appointment and dismissal of the chairman and CEO along with their roles and responsibilities.

Third, there appears an increasing penetration of foreign banks in Vietnam since becoming a World Trade Organization member in 2007. Foreign banks (e.g. foreign branches and affiliates, wholly-owned foreign banks, and joint-venture banks) may increase competitive pressure on traditional activities such as attracting deposits and financing, thus threatening local banks' earnings. As part of sustainable growth, the Vietnamese banking system is open to foreign investors (especially to form a strategic cooperation agreement between local banks and foreign counterparts) to gain foreign partners' knowledge and better managerial skills. Additionally, because the minimum charter capital requirement of VND 3,000 billion is still far below the suggestion of Basel III (Le 2019), the SBV may further increase this requirement. Consequently, banks may face challenges in maintaining growth and profitability while meeting capital requirements, especially in the case of small and medium ones. One of possible solutions is that increase their capital via listing on the stock market. To be listed on the stock market, these banks must have a clear structure of boards of directors according to the requirements of the State Securities Commission. Until 2018, there were 13 listed banks in the stock market.

To further advance good corporate governance, The Vietnamese Governement (2009) promulgated the Decree No.59/2009/ND-CP that a chairman cannot be a CEO in any commercial bank. Small and medium banks have started focusing on corporate governance practices to access more funds and attract more deposits. This is in line with the view

of Charan (2005) that corporate governance can be considered a differentiator among banks as good governance practices can offer them a sustainable competitive advantage. Similarly, Barton et al. (2004) reported that investors were happy to pay a premium of up to 25% for a well-governed enterprise. Nonetheless, the Vietnamese authorities have reemphasized a better and more transparent governance structure, especially the separate roles of a CEO and a chairman, to enhance banking performance. However, the evidence of the relationship between the same personality traits of separate CEO and Chairman and bank performance is limited. Therefore, this study is the first attempt to fill this gap by using the Vietnamese context.

Due to the diverse ownership, the effect of separate CEO and chairman with the same personalities may vary among bank ownership. Hence, it is important to account for this matter.

3. Literature review

The literature on the impacts of CEO and chairman characteristics on firm performance can be classified into three main groups. The first group is about the impact of CEO characteristics on firm performance, whereas the relationship between chairman characteristics and firm performance is focused on in the second group. The last one is the relationship between the difference in attributes between CEO and chairman and firm performance. Note that our study primarily focuses more on the last strand. Nonetheless, these will be discussed in turn.

3.1. CEO personalities and firm performance

Board diversity has a significant role in corporate governance, and much literature exists on the relationship between board characteristics and activities. The 'upper echelons' theory of Hambrick and Mason (1984) considers organizational performance as a result of top managers' values and cognitive abilities in a firm. Nightingale and Toulouse (1977) explained that environmental factors, management values, structures, procedures, and organizational reactions or adjustments are interconnected. Also, business leaders often organize their companies and make strategic decisions based on their own preferences. Several studies have discovered that firm performance is affected by the experience of CEOs through strategic choices (Kaur and Singh 2018; Peni 2014; Saidu 2019; Wei, Ouyang, and Chen 2018); education (Abdul Wahab et al. 2018); CEO power (Ntim et al. 2019; Shahab, Ntim, Ullah, et al. 2020). Malmendier and Tate (2005) examined the association between CEOs' personalities (i.e. overconfidence) and the firms' investment activities. Their results pointed out that the investment of overconfident CEOs is significantly more responsive to cash flow. Similarly, Zhao et al. (2020) found that the ethical characteristics of CEOs have a positive effect on their creativity. Kiss et al. (2021) investigated the influence of the critical CEO personality on firm innovation. Furthermore, sustainable performance is associated with the CEOs with other characteristics such as research background, financial expertise, and foreign exposure (Shahab, Ntim, Chen, et al. 2020).

Nonetheless, the contribution of CEO characteristics has been increasingly discussed in recent economic studies, but there appears no inclusive evidence of the direct

effect of CEO characteristics on firm performance. The difficulty in evaluating a CEO's personality is one of the key reasons why this topic is not given much attention in the literature. However, in recent years, this problem seems to be solved. Researchers have built an amazing amount of evidence demonstrating that personality and values can be effectively measured during the last few decades (Funder 2012; John, Naumann, and Soto 2008). And the plethora of potential personality and value structures can be reliably represented by five basic personality constructs, known as the Big Five or the Five-Factor Model (FFM), that integrate decades of previous studies (John, Naumann, and Soto 2008). The five fundamental dimensions include (a) Extraversion, (b) Agreeableness, (c) Conscientiousness, (d) Neuroticism, and (e) Openness to Experience. Remarkably, the five dimensions of personality can also be predicted (observed) via human facial images (Hu et al. 2017; Jones, Kramer, and Ward 2012) or graphology, including handwriting and signatures (Djamal, Darmawati, and Ramdlan 2013; Kedar and Bormane 2015; Lokhande and Gawali 2017; Maliki and Sidik 2020). Several studies have related the Big Five dimensions to both CEO characteristics and business success, which is particularly relevant for organizational research. O'Reilly et al. (2014) demonstrated that CEO personality influences others' impressions of the organization, such as how employees and the market assess it. Still, the direct effect of the CEO's personality on financial performance is little. Harrison et al. (2019) suggested that the significant relationship between CEO personality and the firm's strategic change depends on the firm's particular situation. Although firm performance and CEO characteristics are both mentioned in their study, the relationship between them is still not direct.

Overall, although the impact of board variables and firm activities is popular in research, empirical evidence of the impact of CEO characteristics on firm performance is limited. There is even no study on the link between CEO characteristics and bank performance (Khan et al. 2021; Nicholson and Kiel 2007).

3.2. Chairman characteristics and firm performance

CEOs are normally research subjects since they are considered the most powerful and prominent executives in a company. On the other hand, the chairman was frequently overlooked in previous research or was studied just as a member of the board (R. B. Adams and Ferreira 2009; S. M. Adams and Flynn 2005; Brammer, Millington, and Pavelin 2007; Campbell and Minguez Vera 2010). Actually, a chairperson of BODs is frequently a long-serving, highly educated member of the firm's management who wields influence inside the company. For instance, Brickley et al. (1999) reported that many chair positions are assigned to current or former CEOs since around 16% of retiring CEOs continue to work as chairmen on the boards. Given the leading role in corporate boards, chairmen may affect the board's decision-making, which would affect firm performance (Bauer, Guenster, and Otten 2004; Chung, Elder, and Kim 2010; Kyere and Ausloos 2021). In short, while looking at the impacts of CEOs that may have on a business's success, chairmen should be looked into as having the same power as CEOs rather than treating them as additional members of the director board. However, there is yet to be a comprehensive study of the probable impacts of executive traits on firm

performance, and the significance of the chairman's attributes, in particular, is still unknown. Therefore, the evidence on the impact of chairman characteristics on bank performance is scanty.

3.3. CEO and chairman characteristics and firm performance

Given the critical roles of the CEO and chairman as explained above, few studies have attempted to examine whether the difference in characteristics between them contributes to firm performance. Notably, Amran et al. (2014) investigated whether firm performance may be affected by characteristics of the CEO and Chairman, including education level, professional qualification, CEO/Chairman age, gender, and ethnicity. They emphasized a positive relationship between the chairman's age, ethnicity and return on assets (ROA). However, CEO's professional qualification and CEO's age impact ROA negatively. Similarly, Peni (2014) focused on some characteristics of the CEO and Chairperson, such as gender, age, busyness, and experience. Their results show that busyness tends to improve firm performance, which is comparable with Kim et al. (2009). More interestingly, Zhou et al. (2019) indicated that a minimum of 20 years of age difference between CEO and chairman mitigate bank risk.

As another sub-strand, most studies have investigated the relationship between CEO/chairman duality and firm performance. CEO/chairman duality is defined as the same person holding the CEO and chairperson positions. As per entrenchment theory, CEO/chairman duality hampers the ability of the boards to supervise and monitor management, thus increasing agency costs (Fama and Jensen 1983; Fernandes et al. 2017). The negative impact of CEO/Chairman duality on firm performance is documented by some studies such as Pi and Timme (1993), Duru et al. (2016), García-Meca et al. (2015), and Gillan (2006). Efficiency theory, however, advocates that one person taking two roles may suit firms' conditions and enhance firm profitability because of unique and consistent command and prominent leadership structure (Fernandes et al. 2017). Some empirical studies have highlighted a positive association between duality and bank performance (Abobakr 2017; Al-Saidi and Al-Shammari 2013; Bhatia and Gulati 2020; Gupta and Mahakud 2020). Several studies have found no relationship between them (Abdul Gafoor, Mariappan, and Thiyagarajan 2018; Daadaa 2020; O'Sullivan, Mamun, and Hassan 2016). Therefore, Bhatia and Gulati (2021) suggested that the authorities should reconsider duality mandates on bank boards.

Whether considering the CEOs and chairmen separately (in terms of characteristics or personality traits) or duality, there is no study on when CEOs and chairmen contradict each other. Hence, this is the first study to examine whether separate CEO and chairman with the same personality traits could affect bank performance. This thus allows us to examine whether entrenchment theory still holds in this case.

And our hypothesis is formed as follows:

H1: There is no relationship between separate CEO and Chairman with the same characteristics and bank performance.

According to the Big Five Personality Model as mentioned above, five personality categories consist of extraversion, conscientiousness, agreeableness, neuroticism, and openness (John, Naumann, and Soto 2008). Costa and McCrae (2008) and John and Srivastava (1999) emphasized the characteristics associated with five categories of personality:

- Openness is characterised by intellectual, independent-minded, imaginative, and insightful;
- Agreeableness is characterised by being friendly, cooperative, and good-natured;
- Conscientiousness is characterised by self-disciplined, responsible, orderly, and dependable;
- Extraversion is often seen as sociable, energetic, talkative, and assertive;
- Neuroticism is considered as anxiety, depression, and self-doubt.

Several studies have attempted to study the specific characteristics of CEOs on firm performance. Nadkarni and Herrmann (2010), using Indian data, showed that extraverted leaders, therefore, can access more external resources, which may reduce firms' costs in business process outsourcing industry. Wang and Chen (2020), using Chinese data, indicated mixed findings. Their findings demonstrated that cost efficiency and profitability are positively affected by CEO extraversion, agreeableness and emotional stability and negatively related to CEO conscientiousness. This is the first study to examine the impact of specific characteristics between separate CEO and chairman according to the Big Five Personality Model on bank performance. Our third hypothesis is created as follows:

H2: There is no impact of specific personalities between separate CEO and Chairman on bank performance.

The literature on the Vietnamese banking system shows that bank ownership is also one of the crucial determinants of bank performance (Le and Nguyen 2020b; Le, Ngo, et al. 2022; Ngo and Tripe 2017; Nguyen et al. 2016). We contend that the impact of separate CEO and Chairman with the same characteristics and bank performance may differ among bank ownership. In Vietnam, banks with diversified structures have developed various strategies and focused on serving various customer segments. For example, SOCBs have long served as a lending arm of SOEs, while POCBs are relatively the most market-oriented by providing universal banking services in particular industries and areas (Nguyen et al. 2016). To maintain their sustainable growth, the efficiency of the board is essential. More specifically, a chairperson is more responsible for running the board, and a CEO is responsible for firms' operations. Hence, their same personalities are even more critical in contributing the efficient and effective board management. In the case of listed banks, shareholders have more incentive to supervise and monitor the board management to ensure bank operates profitably and efficiently because they have their capital at risk at the bank (Le and Nguyen 2020b). Therefore, shareholders tend to prefer the same characteristics of CEO and chairman to minimize the conflict of interest.

Regarding foreign-owned banks, foreign strategic partners may not only transfer knowledge, better managerial skills, especially advanced corporate governance and modern banking technology, to local partners but also provide the necessary capital for them.

Given that the total shares of foreign strategic partners must not exceed 30% of the local partner's charter capital (Le 2021), foreign partners will hold at least one critical position on the board in all cases. In some cases, the board will assign a foreigner as the representative of a foreign partner to the chairman position of the local bank. Again, this reemphasizes that the CEO and chairman's same characteristics are more crucial for listed banks.

Taken together, our second hypothesis is constructed as follows:

H3: There is no joint impact of bank ownership and separate CEO and Chairman with the same characteristics on bank performance.

To the extent that bank ownership may play a critical role in explaining the impact of specific characteristics between separate CEO and chairman on bank performance. Our fourth hypothesis is established as follows:

H4: There is no joint impact of bank ownership and specific personalities between separate CEO and Chairman on bank performance.

4. Methodology and data

4.1. Methodology

Following Le et al. (2022), Cornelli et al. (2020) and Fernandes et al. (2017), a number of regressors are used as the one-year lagged value to reduce endogeneity problems. Furthermore, the inclusion of several bank-specific regressors may preclude using a set of bank dummies. Our baseline model takes the form as follows:

$$Perf_{i,t=}\alpha + \beta_1 CEOCHAIR_{i,t-1} + \beta_2 OWN_{i,t-1} + \beta_3 X_{i,t-1} + \beta_4 Y_{i,t-1} + \beta_5 Z_{t-1} + \varepsilon_i \qquad (1)$$

4.2. Dependent variables

$Perf_{i,t}$ is the profitability of bank i at year t. Following prior studies, risk-adjusted returns on assets (SH_{ROA}) and risk-adjusted returns on equity (SH_{ROE}) are used to measure bank profitability (Le 2017, 2020; Le, Tran, and Nguyen 2019). $SH_{ROA_{i,t=}}\frac{ROA_{i,t}}{\sigma_{ROA_i}}$ where ROA is the pre-tax returns over total assets and σ_{ROA} is the standard deviation of ROA over the entire period. $SH_{ROE_{i,t=}}\frac{ROE_{i,t}}{\sigma_{ROE_i}}$ where ROE is the pre-tax returns over total equity and σ_{ROE} is the standard deviation of ROE over the entire period.[5]

[5]For comprehensive discussions on the advantage of risk-adjusted returns over conventional measures of bank profitability, please see Le and Nguyen, (2020b). However, we use three conventional measures of bank profitability for robustness checks, including net interest margin, ROA, and returns on average equity (Le and Ngo 2020) and the ratio of pre-provision profit to average assets. Similar results are also obtainable, although they cannot be presented here for space limitations. Nonetheless, they are available upon request.

4.3. Independent variables

$CEOCHAIR_{i,t-1}$ is a dummy variable that equals 1 for a bank where separate CEO and chairman have the same characteristics, and 0 otherwise. The literature suggests no best method to measure personality variables because some predictions are considered better than others. For example, one could use personality test scores that either associate with respondent self-ratings using other methods of measuring the same trait or associate with ratings of respondents on the trait by well-acquainted peers, using the same or different inventories (Kalshoven, Den Hartog, and De Hoogh 2011; Paunonen 2003). The Big Five Personality Model is widely used to predict human behaviors (Goldberg 1990). Several studies measure personality following Big Five Personality Model using both written text and conversation (Mairesse et al. 2007). This method is also used to predict CEOs' personalities using CEOs posts on social media such as Facebook and Twitter (Wang and Chen 2020). On the other hand, one may argue that a signature is considered a symbol of a personality trait developed with a neurological model in the human brain. In other words, a signature is brainwriting that illustrates the category of a person's mentality. In graphology theory, a signature identifies traits, qualities, sentiments, attitudes, or postures (Djamal, Ramdlan, and Saputra 2013). Graphical analysis of the structure type of signature is used to predict a person's characteristics, reflecting category personality according to Big Five Personality Model (Lokhande and Gawali 2017). To measure CEO and chairman characteristics, we adopt the work of Lokhande and Gawali (2017) on the prediction of personal traits via their signatures using two steps.[6] In the first step, we identify all possible features that are presented in each signature. For example, the features may include stroke, ascending bottom underline, disconnected streaks, curved start, and the appearance of dot on the letter, and so on. Because each feature represents a certain personality (e.g., curved smoothly feature implies that a person is charming, flexible, sociable, gentle, and outgoing), one signature may provide different personalities. In the second step, we group these personalities into one out of five categories of personality according to the Big Five Personality Model. Five categories of personality appear, including extraversion, conscientiousness, agreeableness, neuroticism, and openness.

Following Le (2021a), we control for three measures of bank ownership (*OWN*). $SOCB_{i,t-1}$ is a dummy variable that equals 1 if a bank is a SOCB, and 0 otherwise. $LIST_{i,t-1}$ is a dummy variable that equals 1 if a bank is listed on the stock exchange, and 0 otherwise. $FOR_{i,t-1}$ is a dummy variable that equals 1 if a bank is foreign-owned, and 0 otherwise. We further include the interaction terms to investigate the role of bank ownership in the relationship between separate CEO and Chairman with the same characteristics ($CEOCHAIR$) and bank performance. The equation (1) is modified as:

$$Perf_{i,t=}\alpha + \beta_1 CEOCHAIR_{i,t-1} + \beta_2 OWN_{i,t-1} + \beta_3 CEOCHAIR_{i,t-1} * OWN_{i,t-1} + \beta_4 X_{i,t-1} + \beta_5 Y_{i,t-1} + \beta_6 Z_{t-1} + \varepsilon_i \quad (2)$$

Based on limited data on CEO and chairman signatures, our diligent analysis (as further illustrated in the Appendix) indicates that the characteristics of CEO and chairman in the

[6]Signature analysis is a prediction method because body language summarizes the human personality from various perspectives, including social skills, thinking styles, achievements, or work habits.

Vietnamese banking system fall into three out of five categories, including conscientiousness, agreeableness, and extraversion. As mentioned by Curşeu et al. (2019), extraversion, conscientiousness and agreeableness that are three personality dimensions are the most relevant to teamwork. Therefore, we use three measures of specific characteristics between separate CEO and chairman $(SPECCEOCHAIR)$ that include$CONS - CONS$, $AGRE - AGRE$, and $EXTRA - EXTRA$. $CONS - CONS$ is a dummy variable that takes a value of 1 for conscientious CEO and chairman, and 0 otherwise. $AGRE - AGRE$ is a dummy variable that takes a value of 1 for agreeable CEO and chairman, and 0 otherwise. $EXTRA - EXTRA$ is a dummy variable that takes a value of 1 for extraverted CEO and chairman, and 0 otherwise. Similarly, we also include the interaction terms to investigate the role of bank ownership in the relationship between $SPECCEOCHAIR$and $Perf$. The equation (1) is reformed as:

$$Perf_{i,t=}\alpha + \beta_1 SPECCEOCHAIR_{i,t-1} + \beta_2 OWN_{i,t-1} + \beta_3 SPECCEOCHAIR_{i,t-1} * OWN_{i,t-1} + \beta_4 X_{i,t-1} + \beta_5 Y_{i,t-1} + \beta_6 Z_{t-1} + \varepsilon_i \quad (3)$$

4.4. Control variables

$X_{i,t-1}$ is a vector of control variables for board characteristics, including board size and board independence (Abdul Gafoor, Mariappan, and Thiyagarajan 2018; De Andres and Vallelado 2008; Liang, Xu, and Jiraporn 2013). Board size ($BODSIZE_{i,t-1}$) represents the bank's number of board of directors. Board independence ($BODINDE_{i,t-1}$) denotes the ratio of independent directors to the board size. $Y_{i,t-1}$ is a set of bank-specific control variables that involve: audit quality, bank size, credit risk, and lending specification (Jin, Kanagaretnam, and Lobo 2011; Le 2020; Le and Nguyen 2020a, 2020b). Audit quality ($BIG4_{i,t-1}$) is a dummy variable that equals 1 if a bank is audited by one of the Big 4 accounting firms, and 0 otherwise. Bank size ($SIZE_{i,t-1}$) is measured by the natural logarithm of total assets. Credit risk ($LLP_{i,t-1}$) is the ratio of loan loss provisions to total loans. Lending specification ($LOAN_{i,t-1}$) is proxied by the ratio of total loans to total assets. Z_{t-1} is a vector of variables for macroeconomic conditions that include: market competition, economic growth (GDP_{t-1}), and inflation (INF_{t-1}) (Le 2021; Le, Tran, and Nguyen 2019). Market competition ($HHI_{i,t-1}$) is measured by Herfindahl-Hirschman index regarding total assets as $HHI = \sum_i^n s_i^2$ where s is the participation of the assets for each bank*i*. The value of *HHI* falls in the range of 0 to 1, where 1 represents a fully concentrated market and 0 denotes no concentration. $GDP_{t-1}$is measured by the annual economic growth rate, while INF_{t-1} is estimated by the annual inflation rate.

Prior to performing our regression, we test for possible multicollinearity using the variance inflation factor (VIF) test. The results show VIF values of all regressors are below a value of 5, and thereby, there is no multicollinearity issue.[7]

[7]Although they are not reported due to the space limitations, they are available upon request. Note that a multicollinearity problem is present if a VIF value of 10 and above.

4.5 Data

Our data was mainly extracted from the financial statements of each bank and the open database constructed by Le, Ho, et al. (2022), including 45 Vietnamese banks from 2002 to 2021. Furthermore, the signatures of CEOs and chairmen used to predict personal traits (*CEOCHAIR* and three categories of personality such as *CONS − CONS*, *AGRE − AGRE*, and *EXTRA − EXTRA*) were manually gathered from annual reports and Resolution of annual shareholders' Meeting reports. Several conditions were applied in choosing the analyzed sample. First, only domestic commercial banks were included in our analysis since they are dominant players, and the operations of joint-venture banks or foreign bank affiliates and policy banks in Vietnam are relatively restricted. Regarding wholly foreign-owned banks, the signatures of CEOs and chairmen and financial information are also unavailable in most banks, thereby excluding them from our sample. Second, after dropping outliers and those domestic banks without data for any of the considered variables and those engaging in merger and acquisition activities, a sample of 26 commercial banks between 2007 and 2020, yielding a total of 356 observations, was obtained.[8] Our unbalanced panel data include the four largest SOCBs and 22 POCBs which together considered 80% of total banking assets in the market. Furthermore, the information on macroeconomic factors was gathered from World Development Indicators deposited in the World Bank database.

As shown in Table 1, the mean of 0.52 suggests that 52% remained commercial banks whose CEO and chairman had the same characteristics (*CEOCHAIR*) over the examined period 2007-2020. More specifically, the number of institutions where CEO and chairman

Table 1. Descriptive statistics for all variables.

Variable	Definitions	Obs	Mean	STD	Min	Max
SH_{ROA}	Risk-adjusted returns on assets	356	1.841	1.526	-2.868	6.875
SH_{ROE}	Risk-adjusted returns on equity	356	0.184	0.167	-0.205	1.648
CEOCHAIR	Equals 1 for a CEO and a chairman with the same personality trait, and 0 otherwise	356	0.520	0.500	0	1
CONS-CONS	Equals 1 for a conscientious CEO and chairman, and 0 otherwise	356	0.419	0.494	0	1
AGRE-AGRE	Equals 1 for an agreeable CEO and chairman, and 0 otherwise	356	0.062	0.241	0	1
EXTRA-EXTRA	Equals 1 for an extraverted CEO and chairman, and 0 otherwise	356	0.039	0.195	0	1
LIST	Equals 1 if a bank is listed on the stock exchange, and 0 otherwise	356	0.348	0.477	0	1
SOCB	Equals 1 if a bank is a SOCB, and 0 otherwise	356	0.154	0.362	0	1
FOR	Equals 1 if a bank is foreign-owned, and 0 otherwise	356	0.410	0.493	0	1
BODSIZE	The number of board of directors in the bank	356	7.309	1.872	4	11
BODINDE	The percentage of independent directors over the board size	356	0.660	0.654	0	4
BIG4	Equals 1 if a bank is audited by one of the largest international accounting firms, and 0 otherwise	356	0.747	0.435	0	1
SIZE	The natural logarithm of total assets	356	32.156	1.335	28.420	34.989
LLP	Loan loss provisions over total loans	356	0.013	0.007	0.001	0.082
LOAN	Total loans over total assets	356	0.586	0.131	0.114	0.980
HHI	Herfindahl-Hirschman index regarding total assets	356	0.093	0.015	0.081	0.130
GDP	The annual economic growth rate	356	0.060	0.011	0.029	0.071
INF	The annual inflation rate	356	0.072	0.062	0.006	0.231

[8]Le (2019) noted that the State Bank of Vietnam has required Vietnamese banks to publish their audited financial information since 2007.

had the same characteristics of conscientiousness (*CONS − CONS*) was 41.9%. Also, the number of banks where CEO and chairman had the same characteristics of agreeableness (*AGRE − AGRE*) was 6.2%, while 3.9% of banks had the same personality of extraversion between CEO and chairman (*EXTRA − EXTRA*).

The average risk-adjusted return measures, including SH_{ROA} and SH_{ROE} are 1.841 and 0.184, respectively. A high standard deviation of SH_{ROA} indicates relative volatility during the examined period. Regarding bank ownership, the number of listed banks (*LIST*), state-owned commercial banks (*SOCB*), and foreign-owned banks (*FOR*) were, on average, 34.8%, 15.4%, and 41%, respectively. The average number of members for a board (*BODSIZE*) and independent board directors over the board size (*BODINDE*) in Vietnamese commercial banks was 7.309 and 0.660, respectively. The number of banks audited by one of the Big Four accounting firms (*BIG4*) was 74.7%. The mean of 0.013 suggests that loan loss provision (*LLP*) accounted for 1.3% of the total loans of the average bank in Vietnam, while the average ratio of total loans to total assets (*LOAN*) was 58.6%. The average value of *HHI* over the examined period was quite low, implying a greater level of bank competition in the Vietnamese market. Also, the average annual GDP growth rate and the inflation rate were 6% and 7.2%, respectively.

5. Findings

5.1. The results of our baseline regression

Prior to performing regression, we first check the multicollinearity issue. Although the table of correlation matrix among variables used cannot be reported due to the want of space, the results demonstrate that none of the variables used in our regression have high correlations.[9] At first glance, both measures of bank profitability are positively related to separate CEO and chairman with the same characteristics.

Table 2 shows that SH_{ROA} and SH_{ROE} are positively associated with *CEOCHAIR*, implying that separate CEO and chairman with the same personality tend to improve bank profitability.

Therefore, hypothesis 1 can be rejected.[10] Our findings partially support the entrenchment theory that having the same characteristics between CEO and chairman may lead to good communication between them and a better understanding of their respective roles to achieve the best bank performance. Therefore, this may reduce the agency cost and interest conflict between the CEO and the board. Stoeberl and Sherony (1985) also advocated that the same characteristics as CEO/chairman duality should result in greater firm performance since it allows clear-cut leadership in strategy formation and execution. It could be the case of the same personality between separate CEO and chairman that could induce greater cooperation between them, coordination and planning of personal behaviours, and effective solutions for interpersonal conflict, thus leading to an effective board (Baker and Salas 1992).

[9]The table is available upon request.

[10]In all cases, R-squares are not high. However, Gujarati (2003) demonstrated that the logical and theoretical relevance of the independent variables to the dependent ones and their statistical significance should be more focused than R-square values because a low value of R-square does not always reflect a bad model.

Table 2. The results of the baseline model.

	SH_{ROA}	SH_{ROA}	SH_{ROA}	SH_{ROA}	SH_{ROE}	SH_{ROE}	SH_{ROE}
CEOCHAIR	0.408***	0.438***			0.057***		
	(0.158)	(0.156)			(0.017)		
CONS-CONS			0.367**	0.373**		0.07***	0.067***
			(0.164)	(0.162)		(0.018)	(0.018)
AGRE-AGRE			0.36	0.485		0.021	0.035
			(0.387)	(0.413)		(0.028)	(0.032)
EXTRA-EXTRA			0.873**	1.042***		0.002	0.022
			(0.377)	(0.364)		(0.023)	(0.02)
LIST	0.72***	0.592***	0.743***	0.612***	0.026	0.026	0.01
	(0.205)	(0.212)	(0.204)	(0.211)	(0.021)	(0.02)	(0.02)
SOCB	0.728**	0.605*	0.713*	0.546	-0.046	-0.03	-0.045
	(0.365)	(0.365)	(0.386)	(0.394)	(0.028)	(0.03)	(0.034)
FOR	-0.33*	-0.36*	-0.328*	-0.365*	-0.025	-0.023	-0.026*
	(0.185)	(0.187)	(0.186)	(0.189)	(0.016)	(0.016)	(0.016)
BIG4	0.64***	0.697***	0.599***	0.648***	0.014	0.018	0.025
	(0.232)	(0.237)	(0.231)	(0.233)	(0.025)	(0.025)	(0.024)
BODSIZE	-0.047	-0.033	-0.051	-0.035	0.008*	0.008*	0.01**
	(0.048)	(0.048)	(0.048)	(0.048)	(0.005)	(0.005)	(0.005)
BODINDE	0.018	0.052	0.013	0.046	-0.003	-0.002	0.001
	(0.046)	(0.04)	(0.046)	(0.04)	(0.005)	(0.006)	(0.006)
SIZE	0.073	0.102	0.078	0.116	-0.008	-0.011	-0.008
	(0.117)	(0.12)	(0.119)	(0.123)	(0.013)	(0.013)	(0.013)
LLP	25.85	29.139*	25.241	27.236	1.249	1.774	2.11
	(16.417)	(17.195)	(17.855)	(18.495)	(1.484)	(1.582)	(1.605)
LOANTA	1.364**	1.669***	1.331**	1.653***	0.165**	0.161**	0.192**
	(0.649)	(0.631)	(0.643)	(0.637)	(0.071)	(0.072)	(0.077)
HHIA	23.987***	77.107	24.39***	76.862	1.583**	1.502**	10.212
	(7.022)	(59.771)	(7.074)	(59.65)	(0.662)	(0.658)	(7.273)
GDP	18.284	170.681	17.868	172.012	2.563*	2.602*	26.293
	(13.461)	(157.38)	(13.455)	(157.09)	(1.391)	(1.394)	(17.826)
INF	2.616*	-51.239	2.665*	-50.703	0.381**	0.365**	-8.518
	(1.436)	(52.599)	(1.451)	(52.542)	(0.158)	(0.156)	(6.639)
Constant	-5.834	-20.546	-5.949	-21.006	-0.117	-0.026	-2.258
	(3.953)	(14.044)	(3.977)	(14.024)	(0.447)	(0.438)	(1.683)
No. Obs	329	329	329	329	329	329	329
R-squared	0.292	0.345	0.296	0.352	0.14	0.15	0.24
Time fixed effect	No	Yes	No	Yes	No	No	Yes

Notes: SH_{ROA}, risk-adjusted returns on assets; SH_{ROE}, risk-adjusted returns on equity; *CEOCHAIR*, equals 1 for a CEO and a chairman with the same personality trait, and 0 otherwise; *CONS − CONS*, equals 1 for a conscientious CEO and chairman, and 0 otherwise; *AGRE − AGRE*, equals 1 for an agreeable CEO and chairman, and 0 otherwise; *EXTRA − EXTRA*, equals 1 for an extraverted CEO and chairman, and 0 otherwise; *LIST*, equals 1 if a bank is listed on the stock exchange, and 0 otherwise; *SOCB*, equals 1 if a bank is a SOCB, and 0 otherwise; *FOR*, equals 1 if a bank is foreign-owned, and 0 otherwise; *BODSIZE*, the number of board of directors in the bank; *BODINDE*, the percentage of independent directors over the board size; *BIG4*, equals 1 if a bank is audited by one of the largest international accounting firms, and 0 otherwise; *SIZE*, the natural logarithm of total assets; *LLP*, loan loss provisions over total loans; *LOAN*, total loans over total assets; *HHI*, Herfindahl-Hirschman index regarding total assets; *GDP*, the annual economic growth rate; *INF*, the annual inflation rate. Robust standard errors are in parentheses. *, **, *** Significant at 10, 5, and 1 levels, respectively.

For control variables, the positive coefficients on *BIG*4 argue that external audit quality by one of the Big 4 accounting firms may enhance bank profitability (Al-Ahdal and Hashim 2022). The coefficients on *BODSIZE* are positive and significant, implying that board size may improve bank performance (Kusi et al. 2018; Mbanyele 2020). The findings also highlight that lending specification (*LOANTA*) may increase bank profitability (Brei, Gadanecz, and Mehrotra 2020; Ho et al. 2021; Le 2018). Furthermore, market concentration (*HHIA*) may enhance bank profitability, thus supporting the structure-conduct-performance hypothesis (Dietrich and Wanzenried 2014; Saona 2016). The findings also reveal that Vietnamese banks may fully anticipate inflation, so they are proactive in

adjusting their interest rate accurately – earning higher profits (Pervan, Pelivan, and Arnerić 2015).

As explained above, the three personality traits of CEO and chairman, according to the Big Five Personality Model, are further examined. When observingSH_{ROA}, the coefficients of $CONS - CONS$ are positive and significant, suggesting that risk-adjusted return on assets is more likely associated with conscientious CEO and chairman. Conscientiousness traits include being orderly, responsible, dependability, and self-disciplined (John and Srivastava 1999), so conscientious leaders have the strength to fulfil their ambition and difficult tasks (Costa and McCrae 2008). On the board, conscientious CEO and chairman tend to be highly committed to the board task (Peeters et al. 2006). Because conscientiousness is more likely to promote the development of interpersonal trust and cooperation (O'Neill and Allen 2011), conscientious CEO and chairman could harmonize shareholders' interests and firms' performance. Furthermore, Sheridan (1992) highlights that conscientious CEOs are likely motivated by outcome-oriented cultures with high expectations since they are ambitious. Therefore, firm performance is associated with CEO conscientiousness (Kaplan, Klebanov, and Sorensen 2012).

Additionally, the same result is true in the case of extraversion CEO and chairman ($EXTRA - EXTRA$). Prior studies have suggested that extraverted leaders can improve cost efficiency and employee productivity (Wang and Chen 2020), thus enhancing bank profitability. Extraversion is characterized by sociability, gregariousness, talkativeness, assertiveness, and dominance (McCrae and Costa 1987). Extraverted leaders, therefore, can access more external resources, which may reduce firms' costs (Nadkarni and Herrmann 2010). Extraverted leaders are also more assertive and more successful in conveying their decisions and opinions to employees, whose productivity is greatly dependent on the clarity of the order and the efficiency of communication with their leaders (Judge et al. 2002). However, we do not find evidence that agreeable CEO and chairman, in general, could increase bank profitability. Nonetheless, hypothesis 2 can be rejected.

For bank ownership, as presented in Table 2, the positive and significant coefficients on *LIST* and *SOCB* show that listed banks outperform non-listed banks, and the profitability of SOCBs is higher than that of POCBs. The negative and significant coefficients on *FOR* indicate that foreign ownership may decrease bank profitability. This is comparable with the findings of Le and Nguyen (2020b) and Le and Nguyen, (2020b) in Vietnam.

Given the importance of bank ownership, we further study whether the relationship between bank profitability and the characteristics of CEO and chairman may differ among bank properties. We include the interaction between *CEOCHAIR* and bank ownership (*LIST*, *SOCB*, and *FOR*) in our original model. The variables of bank ownership will be excluded to avoid multicollinearity.

As presented in Table 3, the coefficients of $CEOCHAIR * LIST$ are positive and significant, implying that the same characteristics between CEO and chairman tend to improve risk-adjusted return on assets in the case of listed banks. Thus, hypothesis 3 is rejected. Because there are many shareholders in listed banks, maintaining greater performance puts more pressure on the effectiveness and efficacy of the board. Because a chairperson is more responsible for running the board and is the major shareholder, and a CEO is responsible for the firms' operations, the personality of the CEO and chairman plays a more critical contribution to the efficiency of the board. Therefore, this reemphasizes that the CEO and chairman's same characteristics are more crucial for listed banks.

Table 3. The table of results using the interaction terms.

	SH_{ROA}	SH_{ROA}	SH_{ROA}	SH_{ROA}	SH_{ROE}
CEOCHAIR	0.313	0.329			0.066***
	(0.211)	(0.208)			(0.022)
CEOCHAIR*LIST	0.718**	0.563*			-0.031
	(0.286)	(0.307)			(0.033)
CEOCHAIR*SOCB	0.009	0.094			-0.01
	(0.377)	(0.386)			(0.031)
CEOCHAIR*FOR	-0.227	-0.124			0.014
	(0.274)	(0.291)			(0.027)
CONS-CONS			0.164	0.18	
			(0.186)	(0.181)	
AGRE-AGRE			0.951*	1.123**	
			(0.502)	(0.557)	
EXTRA-EXTRA			0.369	0.58	
			(0.599)	(0.585)	
CONS-CONS*LIST			0.717**	0.647**	
			(0.287)	(0.284)	
AGRE-AGRE*LIST			-0.483	-0.748	
			(0.55)	(0.594)	
EXTRA-EXTRA*LIST			1.606**	1.435**	
			(0.669)	(0.686)	
Constant	-11.886***	-26.252*	-11.868***	-26.433*	-1.922
	(3.487)	(14.051)	(2.935)	(13.789)	(1.597)
Control variables	Yes	Yes	Yes	Yes	Yes
No. Obs	329	329	329	329	329
R-squared	0.265	0.324	0.28	0.345	0.23
Time fixed effect	No	Yes	No	Yes	Yes

Notes: SH_{ROA}, risk-adjusted returns on assets; SH_{ROE}, risk-adjusted returns on equity; *CEOCHAIR*, equals 1 for a CEO and a chairman with the same personality trait, and 0 otherwise; *CONS − CONS*, equals 1 for a conscientious CEO and chairman, and 0 otherwise; *AGRE − AGRE*, equals 1 for an agreeable CEO and chairman, and 0 otherwise; *EXTRA − EXTRA*, equals 1 for an extraverted CEO and chairman, and 0 otherwise; *LIST*, equals 1 if a bank is listed on the stock exchange, and 0 otherwise; *SOCB*, equals 1 if a bank is a SOCB, and 0 otherwise; *FOR*, equals 1 if a bank is foreign-owned, and 0 otherwise; *CEOCHAIR ∗ LIST*, the interaction term between *CEOCHAIR* and *LIST*; *CEOCHAIR ∗ SOCB*, the interaction term between *CEOCHAIR* and *SOCB*; *CEOCHAIR ∗ FOR*, the interaction term between *CEOCHAIR* and *FOR*; *CONS − CONS ∗ LIST*, the interaction term between *CONS − CONS* and *LIST*; *AGRE − AGRE ∗ LIST*, the interaction term between *AGRE − AGRE* and *LIST*; *EXTRA − EXTRA ∗ LIST*, the interaction term between *EXTRA − EXTRA* and *LIST*. Same set of control variables in Equation 1 is used, and their definitions are indicated in Table 1. Robust standard errors are in parentheses. *, **, *** Significant at 10, 5, and 1 levels, respectively.

Because the same characteristics between CEO and chairman are found to increase the performance as above, we further investigate which specific personality traits of CEO and chairman could contribute to the outperformance of listed banks. Table 3 also indicates the positive coefficients on *CONS − CONS ∗ LIST* and *EXTRA − EXTRA ∗ LIST* that the greater profitability of listed banks is more likely associated with conscientious and extraverted CEO and chairman, thus rejecting hypothesis 4. When the interaction terms between specific personality traits of CEO and chairman (*CONS − CONS*, *AGRE − AGRE*, and *EXTRA − EXTRA*) and bank ownership (*LIST*, *SOCB*, and *FOR*) are together included in the same equation, the findings show that the coefficients of *CONS − CONS ∗ LIST*, *EXTRA − EXTRA ∗ LIST*, *EXTRA − EXTRA ∗ SOCB*, and *EXTRA − EXTRA ∗ FOR* are positive and significant. Nonetheless, this reemphasizes that extraversion seems to play a critical role in explaining bank performance of the Vietnamese commercial banks.

Additionally, CEO and chairman with same characteristics hardly affect bank profitability in the case of foreign-owned and state-owned banks.

6. Robustness checks

For robustness checks, we follow Tarchouna et al. (2021) to explore whether the impact of same characteristics of CEO and chairman on bank profitability may differ among bank sizes. Following Fernandes et al. (2021), we then investigate the impact of CEO and chairman personalities on bank performance when the crisis is considered.

Table 4. The results in subsamples.

	SH_{ROA}	SH_{ROA}	SH_{ROE}	SH_{ROE}
CEOCHAIR	0.201		0.035	
	(0.196)		(0.024)	
CONS-CONS		0.118		0.043*
		(0.207)		(0.026)
AGRE-AGRE		1.659**		0.027
		(0.67)		(0.059)
EXTRA-EXTRA		-0.132		-0.032
		(0.373)		(0.028)
CEOCHAIR*BIG	0.541*		0.056*	
	(0.322)		(0.033)	
CONS-CONS*BIG		0.582*		0.052
		(0.332)		(0.036)
AGRE-AGRE*BIG		-1.817**		0.03
		(0.809)		(0.071)
EXTRA-EXTRA*BIG		1.937***		0.104***
		(0.577)		(0.039)
LARGE	-0.251	-0.312	-0.022	-0.026
	(0.208)	(0.209)	(0.019)	(0.02)
Constant	-17.654	-16.646	-2.551	-2.563*
	(13.155)	(13.294)	(1.553)	(1.552)
Control variables	Yes	Yes	Yes	Yes
No. Obs	329	329	329	329
R-squared	0.35	0.386	0.242	0.248
Time fixed effect	Yes	Yes	Yes	Yes

Notes: SH_{ROA}, risk-adjusted returns on assets; SH_{ROE}, risk-adjusted returns on equity; *CEOCHAIR*, equals 1 for a CEO and a chairman with the same personality trait, and 0 otherwise; *CONS − CONS*, equals 1 for a conscientious CEO and chairman, and 0 otherwise; *AGRE − AGRE*, equals 1 for an agreeable CEO and chairman, and 0 otherwise; *EXTRA − EXTRA*, equals 1 for an extraverted CEO and chairman, and 0 otherwise; *BIG*, a dummy variable that equals 1 if a bank is a large one, and 0 otherwise; *CEOCHAIR ∗ BIG*, the interaction term between *CEOCHAIR* and *BIG*; *CONS − CONS ∗ BIG*, the interaction term between *CONS − CONS* and *BIG*; *AGRE − AGRE ∗ BIG*, the interaction term between *AGRE − AGRE* and *BIG*; *EXTRA − EXTRA ∗ BIG*, the interaction term between *EXTRA − EXTRA* and *BIG*. Same set of control variables in Equation 1 is used, and their definitions are indicated in Table 1. Robust standard errors are in parentheses. *, **, *** Significant at 10, 5, and 1 levels, respectively.

In this study, if the total assets of a bank are above (or below) the median, the bank is classified as a large one (or a small bank) (Le 2021; Le and Pham 2021; Le, Tran, and Nguyen 2019).[11] Due to the relatively small sample size, we then use *BIG* as a dummy variable that equals 1 if a bank is defined as a large one, and 0 otherwise. The results of the impact of the interaction between the personality traits of CEO and chairman and bank size on risk-adjusted returns are presented in Table 4. As shown, the coefficients of *CEOCHAIR ∗ BIG* are positive and significant, implying that the same personality of CEO and chairman are essential to improving risk-adjusted returns of large banks. Additionally, extraversion (*EXTRA − EXTRA ∗ BIG*) and conscientiousness (*CONS − CONS ∗ BIG*) still have a critical contribution to improving bank profitability for large banks, while agreeableness (*AGRE − AGRE ∗ BIG*) tends to play a significant role for small peers.[12] Small banks tend to focus on improving employee productivity and cost efficiency rather than directly competing with large banks in profitability growth. Agreeableness is one of the personalities to accommodate this objective because agreeableness exhibits personal warmth, cooperation orientation, and others' acceptance and trust (McCrae and Costa 1987).[13] Agreeable CEOs and chairmen can obtain broader social

[11]The results are available upon request.
[12]When dividing the original sample into subsamples (large vs. small banks), similar results are also obtained.
[13]Empirical studies argue that agreeableness and extraversion are almost the same as their outcome is interpersonally oriented (Derue et al. 2011).

relationships inside and outside the firms, thus improving cost efficiency via their accessibility to external sources (Wang and Chen 2020). Agreeableness could help group members maintain a harmonious relationship and mitigate potential conflicts (Mount, Barrick, and Stewart 1998). This personality trait seems more appropriate for CEOs and chairmen in small banks.

Secondly, we include*CRISIS* as a dummy variable that equals 1 for the global financial crisis period 2008-2009, and 0 otherwise in the model (Le and Ngo 2020; Le and Nguyen 2021; Le et al. 2020). While the coefficients of *CRISIS* are negative and significant, the coefficients of interaction terms between *CRISIS* and personality traits of CEO and chairman (*CEOCHAIR*, $CONS - CONS$, $AGRE - AGRE$) are positive though statistically not significant.[14] These suggest no sufficient evidence that the same characteristics of CEO and chairman could improve risk-adjusted returns under the impact of the global financial crisis. Furthermore, we also consider the impact of the COVID-19 pandemic (as a dummy variable that equals 1 for year 2020 as the health crisis period, and 0 otherwise).[15] Because of the small sample size and short-examined period, we could not find the significant impact of the COVID-19 outbreak on the Vietnamese banking system.

7. Conclusions

This study investigated the impact of CEO and chairman personality traits on bank performance in Vietnam from 2007 to 2020 by analysing the signatures of CEOs and chairmen. The findings show that separate CEOs and chairmen with the same characteristics tend to increase bank profitability. This extends the entrenchment theory that firms may benefit from separating CEOs and chairmen roles when they have the same personality traits. When observing their specific characteristic dimensions according to the Big Five Personality Model, the findings show that extraversion and conscientiousness play more crucial roles in explaining the increased bank profitability benefited from the separate roles between CEOs and chairmen. Therefore, the findings suggest that separation between CEO and chairman is important for bank management, and either CEO or chairman appointed by the board should have the same personality trait as each other to achieve better performance. The candidates for these positions are either extraverted or conscientious. The findings also demonstrate that these two personality traits of CEOs and chairmen are even more crucial for listed and large banks. This implies that these banks should pay more attention to recruiting either extraverted or conscientious CEOs and chairmen. For small banks, the findings suggest agreeableness should play a critical consideration in appointing CEOs and chairmen on the board. Those results are robust across several models and estimation methods.

Also, risk-adjusted returns are positively affected by audit quality, board size, and lending specification. Therefore, financial information should be audited by one of the Big 4 accounting firms to enhance the transparency and quality of their financial reports. Bank management should also focus on an increase in board size to perform the board's fiduciary and other duties efficiently and effectively. Last, bank managers should pay more attention to bank loans since they are considered more valuable than other assets.

[14]The results are available upon request. Note that no observation takes a value of 1 for the case of $EXTRA - EXTRA * CRISIS$. Therefore, this interaction variable is omitted.
[15]The results are available upon request.

As the first attempt to examine the relationship between separate CEOs and chairmen with same characteristics and bank profitability, especially for the Vietnamese banking sector, this study contributes to the graphology literature (regarding using signatures to predict personalities), management and business ethics literature (regarding using the Big Five model of personality traits to predict performance), and the banking literature (in terms of explaining the determinants of profitability of Vietnamese banks). However, it would be more interesting to investigate if there is a bi-directional relationship between separate CEOs and chairmen with same characteristics and bank performance, instead of a one-way relationship as in the current paper, as one may argue that bank performance may attract certain types of CEOs/leaders. Future studies perhaps need to evaluate this relationship in other emerging countries with similar banking conditions and structures to confirm our above findings. Moreover, one could also extend the study to a larger/longer dataset, especially to assess the impacts of the unprecedented COVID-19 pandemic (Boubaker, Le, and Ngo 2022; Narayan and Juhro 2022; Njindan Iyke, Sharma, and Gunadi 2021) because our study only considered one year impact of this health crisis due to data unavailability. Last but not least, it is also crucial to investigate this relationship in other sectors, such as manufacturing or agriculture (Kaur and Singh 2018; Ngo et al. 2019; Ngo, Vu, et al. 2019; Yeoh and Hooy 2020). We leave those tasks for future research.

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Conflict of Interests

The authors have no relevant financial or non-financial interests to disclose.

Data availability statement

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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Appendix A

The illustration of the analysis of CEOs and Chairmen' signatures.

CEO signature	Features	Personality categories according to Big Five Personality Model
	Simple, Ascending, Underline, Ending stroke increase	Conscientiousness
	Simple, Underline, Ending stroke increase	Conscientiousness
	Curved start, Underline, Ending stroke increase	Extraversion
	Small Signature, Underline	Extraversion
	Streaks disconnected, Underline, Ending stroke increase	Agreeableness
	Full surname, ascending, underline, ending stroke increase	Agreeableness
	Angular Strokes, Ascending, underline, ending stroke increase	Extraversion

Source: Adopted from Lokhande and Gawali (2017)