

# **The Chair-CEO Chronological Age Gap and Bank Performance: The Effects of Financial Crisis Shock**

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## **Abstract**

This study investigates the effect of the Chair-CEO chronological age gap on the performance of commercial banks listed on the London Stock Exchange. We examine either the Chair-CEO generational gap (a minimum age gap of 20 years) or the Chair-CEO age difference (+/- or absolute). We find significant evidence for the hypothesis that the Chair-CEO age dissimilarity is likely to increase bank performance. Additional identification attempts include the use of the 2007-2009 financial crisis as an exogenous shock to monitoring needs. We find that during the crisis, the positive linkage between age difference and bank performance was more intensified.

**Keywords:** Chair; CEO; Age dissimilarity; Banks; Board of directors; Performance

**JEL Classification:** C23, G01, G21, G28, L50, M41

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## 1. Introduction

Conflicts among individuals serving on corporate board of directors have been well-acknowledged as a critical issue in organisations. These conflicts may impose either negative or positive impacts on the quality of board decision-making, including goal-setting process of firms and other firms' behaviours, which indirectly affect their performance. Literature over decades has provided numerous theoretical and empirical evidence on this issue (*see, e.g.,* Amason and Mooney, 1999; Simons and Peterson, 2000; Jehn and Chatman, 2000). They generally state that different conflicts are present in every decision-making process. Whenever boards make choices and decisions, a series of competing opinions, perspectives, views, needs and agendas across board members is inherently unavoidable. Those conflicts within the board of directors could be manifested itself and its consequences on the decision outcomes and last execution, has been a great interest of both academics and practitioners (Clerkin and Jones, 2013). Serious conflicts caused by different views of board team members may lead to rejection or acceptance of valuable projects, thus arguably affecting firm performance.

Board effectiveness in making informed decisions, however, might be affected by personal cognitions of board members since directors may judge and evaluate key corporate strategies and policies differently as do executives. Consequently, underlying cognitive conflicts can lead to disagreements and conflicts among them, which require thorough discussion and solid consideration to be resolved. As a result, decision making of boards can be improved especially in uncertain business environments (Forbes and Milliken, 1999). One of the common channels through which those conflicts can occur is the age difference among board members. Members of different generations may have different expectations about the firm's future prospective, resulting in different goal setting as well as different project appraisal techniques. Alternatively, age dissimilarity may influence firm performance in a way that board members might keenly communicate, interact, and monitor each other due to the generational distance (Goergen et al., 2015).

A sizable body of studies have focused on the systematic linkage between directors' age and performance (e.g., Waelchli and Zeller, 2013; Serfling, 2014; Berger et al., 2014). Relatively little (except for Goergen et al., 2015) minds the gap in how age dissimilarity between the Chairman (Chair, hereafter) and the CEO is related to firm performance, especially in banks. Elmghaamez and Akintoye (2020) and Al-ahdal and Prusty (2020) emphasised an essential need for a sound understanding of the influence of the internal governance, particularly, the Chair on corporate governance as well as the form of the optimal Chair-CEO linkage (Goergen et al., 2015). They, thus, examined the relation between the Chair-CEO age difference and firm value under the German two-tier board system. They find a positive relationship between substantial Chair-CEO age difference and board monitoring as well as corporate value. Furthermore, they also suggest that further research should focus on Chair's characteristics as there is an increasing need for understanding the influence of the Chairman and his relation to other members.

In our study setting, banking institutions are more complex and opaque firms compared to non-financial (industrial) peers with more sophisticated governance codes due to its needs of higher monitoring levels (Elnahass et al., 2020a,b; Trinh et al., 2020a, b, c, d). Especially, after the recent global financial crisis 2007-2009, the contagious collapse of the banking system had

disastrously damaged the whole global economy and financial markets, bank governance quality has been emphasized to assure the soundness of bank performance. Therefore, they may be more likely to be affected by the substantial age difference between the Chair and the CEO. In addition, the importance of investigating performance in the banking sector has been significantly growing, which makes this study timely. To date, there is no empirical banking study that tests the age difference between Chairs and CEOs of firms listed on the London Stock Exchange (LSE), suggesting a new investigation on this market. LSE and banking studies only mainly focus on other board characteristics such as board gender diversity, board size, and board independence, to mention a few (e.g., Trinh et al., 2018; Pasaribu, 2017; Gregory-Smith et al., 2014). LSE is a valuable sample for this research as its Corporate Governance Code including banks guides that the Chair and the CEO must be two different individuals (Goergen et al., 2015). Based on the UK Board Index (2015), the average age of the Chair (64.1 years old for men and 56.8 years old for women) is higher than that of the CEO (54 years old for men and 49.8 years old for women). Thereby, in this study, we try to contribute novel knowledge on this concept by investigating the impact of the Chair-CEO age dissimilarity on the operating performance of LSE-listed banks. By doing so, our study extends the existing research of Goergen et al. (2015) and other corporate governance literature (e.g., Trinh et al., 2018; Pasaribu, 2017).

We employ homophily as the main theoretical framework to describe the potential link between the Chair-CEO age difference and bank performance. It refers to the “*similar attraction*” phenomenon that people with similar demographic attributes tend to communicate and interact more with each other which in turn moderates cognitive conflicts (McPherson et al., 2001). This is also supported by theories of social identity (Tajfel, 1974) and self-categorisation (Turner et al., 1987), which contend that individuals are likely to classify themselves and others into different groups through employing personally meaningful dimensions i.e., demographic categories. Basically, a higher age difference between the Chair and the CEO may create more cognitive conflicts as they have less communication and interaction (homophily) and classify them into different groups (theories of social identity and self-categorisation). In this study setting, the Chair and the CEO play key roles within a board. Both positions tend to be affected by homophily through their interaction; hence, they significantly affect corporate boards’ performance (Goergen et al., 2015). Age dissimilarity between the Chair and the CEO causes an increased mismatch in views and thoughts because they may experience the different historical events and social trends, thus, increase cognitive conflicts which require more efforts of the Chair in monitoring the CEO. As such, their attitudes towards risk and religious aspects may be different. As a result of those cognitive differences, the Chair and the CEO with a large age gap may exhibit weak rapports, strengthening the monitoring duties of the Chair through stronger independence and objectiveness. Therefore, the bank performances can be enhanced. Another angle on the age dissimilarity argues that age difference between the Chair and the CEO may reduce communication and informational exchange between them that increases information asymmetry within firms (e.g., high agency problem). These two opposite predictions and a lack of evidence in banks (which shows high monitoring needs from the Chair to the CEO) call for more research in this issue.

We employ a unique unbalanced panel of 18 listed banks in London Stock Exchange for a stretched period of 1989-2017. We utilise both, the Chair-CEO generational gap (minimum of

20 years age difference) and the Chair-CEO age difference (+/- or absolute), as our main interest variables. Results indicate that banks with larger (or, substantial) age difference between the Chair and the CEO exhibit better financial performance. This is consistent with homophily hypothesis and prior studies (e.g., Goergen et al., 2015). Remarkably, we find that such a positive relation appears to be stronger during the financial crisis. Possibly, the board of directors including the Chair obtains more fully and accurately information provided by the CEO who were trying to convince the former to approve their strategic plans. They thus are likely to successfully find better solutions for their banks, e.g., appropriate strategies to overcome the crisis.

Our work makes a noteworthy contribution to the limited literature about the influence(s) of the Chair's characteristics on firm performance. To the best of our knowledge, only two studies work on the age-related topic. First, Waelchli and Zeller (2013) found the adverse role of Chair's age on unlisted Swiss firms' performance. More related to our study, Goergen et al. (2015) examined the Chair-CEO age gap on financial performances of firms. They find that a larger age gap between the Chair and the CEO tends to improve German firms' value. Nonetheless, both above studies were conducted on a non-bank sample. We, therefore, are the first to do so and find a positive relation between Chair-CEO age difference and LSE banks' profitability. We also contribute to the emerging literature (e.g. Hwang and Kim, 2009; Nguyen, 2012; Fracassi and Tate, 2012; Lee et al., 2014) on the impact of (dis)similarities between the CEO and members of board of directors. While the studies mentioned previously mainly focus on the entire boards and similarity stemming from social ties, our research emphasises demographic similarity and especially the indispensable linkage between the Chair and the CEO. Results of the current study can provide recommendations to regulators, market participants and listed banks in LSE by raising a higher awareness regarding the effect of having a CEO and a Chair of different ages. In addition, investors who want to invest in LSE can rely on our findings to make their profound investment decisions to enhance investment effectiveness and profitability. Finally, this study should be also a good reference for further research in the subject of related corporate governance areas.

The remainder of the article is as follows. *Section 2* presents the related studies and hypothesis development. *Section 3* presents methodology, sample selection and descriptive statistics. This is followed by *Section 4* and *5* which report the finding and analysis, and sensitivities/robustness checks, respectively. Finally, a conclusion in *Section 6* closes the study.

## **2. Background and hypotheses**

### *2.1. Related Studies*

The subprime mortgage crisis and the following credit crunch have emphasised a significant effect of inadequate governance practices of banks on their excessive risk-taking, financial instability and poor performance (*see* Diamond and Rajan, 2009; Kirkpatrick, 2009; Beltratti and Stulz, 2012; Peni and Vahamaa, 2012; Jizi et al., 2014). Policymakers thus have indicated that more effective governance mechanisms can curb a bank's excess risk-taking and improve its financial performance, which is vital to enhance the soundness of the financial system (OECD, 2010; BIS, 2014). Prior research in the non-financial sector has been extensively conducted on the linkage between characteristics of the boards of directors (board size, board

independence, and CEO duality) and firm performance, risk-taking and market value (e.g. Carter et al., 2003; Adams and Ferreira, 2009; Pathan, 2009; Gerged and Agwili, 2020; Ferramosca, D'Onza, Allegrini, 2017). Unfortunately, extremely limited studies inform literature about the Chair of the boards in general, and the Chair-CEO age dissimilarity influence on firm performance in particular. Goergen et al. (2015) is an exceptional attempt, but only tested for German industrial firms' value.

The complexity and opacity of banking institutions tend to impose challenges for effective governance characteristics (Wilson et al., 2010). Indeed, informational asymmetries between management and shareholders appear to be prevalent. Informationally opaque bank assets are likely to encourage management to take higher risks without being sufficiently scrutinised and assessed by external stakeholders (Diamond, 1984; Morgan, 2000; Becht et al., 2011). Also, moral hazard and adverse selection issues can arise due to the "too-big-too-fail" concept of bank and other safety net subsidies, and this, hence, increases banks' incentives to take more perceived risk (Molyneux et al., 2014). However, the bank board of directors can oversee risk management and improve the bank financial stability as well as its performance by effectively providing four core functions to banks (Srivastav and Hagedorff, 2015). These consist of scrutinising/managing managers, providing information and counsel to managers, monitoring compliance with applicable laws and regulations, and connecting the corporation to the external environment (e.g. Carter et al., 2010).

Such discussion raises the need for investigation on banking in relation to corporate governance, especially, the relation between CEO and Chairman (Gontarek and Belghitar, 2021; Ferramosca, D'Onza, & Allegrini, 2017). Particularly, Gontarek and Belghitar (2021) have emphasised in their study on the critical influences, which can be problematic, of CEO-Chair relation on the strategic decision making in the banking sector. Nonetheless, although previous studies have attempted to address key functions of the boardroom in various ways, research of corporate governance within banks is still deficient. Most existing banking governance studies (e.g., Pathan, 2009; Fortin et al., 2010; Adams, 2012; Minton et al., 2014; Peni and Vahamaa, 2012) have argued that the composition of the board of directors can affect the execution of these functions, hence, the strong board might enhance the bank financial performance. They find that over the crisis, larger boards of directors in US financial institutions generally are associated with higher risk-taking and lower performance. Other studies (e.g. Akhigbe and Martin, 2008; Minton et al., 2014; Feleye and Krishnan, 2015) find a negative effect of board size and bank risk for the pre-crisis period. In addition, Wang and Hsu (2013) tested for pre- and post-crisis periods and explored that banking firms are likely to be riskier when they have bigger boards of directors. Most of these studies were conducted in the US. Most of these studies were conducted in US. Other cross-country studies in banks (e.g., Beltratti and Stulz, 2012) conclude that larger boards of directors are related to higher bank performance during crisis periods while Erkens et al. (2012) cannot find such association for the pre-crisis period. Although this link between board size and bank performance are ambiguous, empirical evidence on board independence (e.g., Beltratti and Stulz, 2012; Erkens et al., 2012; Minton et al., 2014; Faleye and Krishnan, 2017) are clearer that board independence mitigates the risks of banks and hence, bank financial performance. Bank performance can be also affected by various demographics of board of directors such as directors' age, gender and educational degree. For instance, bank boards with a greater portion

of younger and female executive directors tend to increase portfolio risk and lower operating performance whilst boards with more directors with PhD reduce bank risk and enhance performance (Berger et al., 2014).

Among these many board attributes, prior research (e.g., Pesamaa et al., 2008) finds a positive relationship between board members' average age and corporate sales. Average age can capture an aspect of board diversity which shows a significant effect on performance. In addition, the qualifications as well as compositions of the boards have emerged as focal points in the ongoing corporate governance dialogue. Increasingly, there is a higher need for board directors with profound management experience, skills and diverse perspectives to serve clients, execute relative competitive strategies and more importantly, to bring substantial value to the firm shareholders. As such, the diversity of gender, race and, to a lesser extent, director age is also noteworthy in this evolving board composition mix (Goergen et al., 2015). A board that has a good mix of directors with different age, experience and youthful perspectives is more likely to balance the insight and experience that comes from older directors with longer tenure and the new ideas introduced by younger as well as less-experienced counterparts (Pesamaa et al., 2008). Such age-diverse boards may indeed benefit a bank in providing a range of viewpoints and experiences (Zhou et al., 2019). However, to date, there is no empirical study that tests the age difference between Chairs and CEOs within banks in LSE. This study, therefore, provides incremental knowledge to the extant literature by setting the following research questions: does age dissimilarity between the Chair and the CEO improve board monitoring, and in turn, LSE bank performance?

## *2.2. Age and age similarity*

Homophily theory argues that a less effective governance of the board comprises demographic and social similarity between CEOs and other directors. The reason is that they are likely to communicate with each other and ensure more affirmative feedback, yet disagreement is limited due to lack of diverse views and opinions (Byrne, 1971; Byrne and Griffitt, 1973; McPherson et al., 2001). As explained by Schiff (2013), accumulating misunderstanding and miscommunication from the chronological age gap can lead to conflict and disgruntlement. He also stated that the generational gap eventually causes real rifts which damage the firms' productivity, performance, and morale. Those relationship cracks can be stemmed from age differences in personal values and/or professional values. For example, younger professionals may disagree with the amount of supervision required by older seniors; and older colleagues may expect a certain amount of respect from the young (Schiff, 2013). Furthermore, the literature has reported a wide range of individual perceptual differences across age, which importantly attribute to the financial corporation context. For example, age differences in financial risk perception and financial risk tolerance (e.g., Otani et al., 1992; Tanaka et al., 2010; Albert and Duffy, 2012; Weber, 2014).

Advocates for this homophily argument find that US boards of directors where the firm's CEO has similar shared networks, similar regional or educational background or political orientation, with other board members, are related to lax governance mechanisms, and hence, destroy corporate performance (Fraccassi and Tate, 2012; Hwang and Kim, 2009; and Lee et al., 2014). Nguyen (2012) also finds similar findings for large French organisations. Interestingly, Westphal and Zajac (1995a) contend that CEOs who can participate in the

nomination process for other executive directors are likely to employ directors who have similar demographic attributes (e.g., age) with them. Similar demographic characteristics between the board and CEOs are also related to higher CEO compensation. Westphal and Zajac (1995b) find that to justify the implementation of a CEO's long-run incentive strategy in the context of similar demographic attributes between the board and the CEO, human-resource based explanations (i.e., attracting and retaining talented directors) are more likely to be employed than agency-based explanations (i.e., conflicts of interest).

Pleffer (1983) indicates that demographic attributes (i.e., age, education, nationality, gender) influence individual behaviour through affecting on his views, thoughts and attitudes, hence, his decision-making. Among them, age plays a divergent role to others in forming an individual's decision selection because of its multifarious nature and dynamic collection of personal characteristics which covers his life-time experience. As such, an individual's personal attitudes and characteristics are progressively shaped by a diverse set of factors constituted by aging (Medawar, 1952), hence, continuously influencing his behaviour, communication, strategic decision-making, information processing and usage, risk-taking, attitudes, thoughts and commitment to work (e.g., Child, 1974; Hambrick and Mason, 1984; Rhodes, 1983; Serfling, 2014). Aging, in nature, can be referred to as one of the personal characteristics of human beings, which constitutes a salient basis for group classification as it shapes various attitudes or behaviours (Stangor et al., 1992). On this point, Ferris et al. (1991) contend that the general social context that organisational members interact with each other, could be established by the vital role of aging. Wagner et al. (1984) then widen this to board members. They argue that directors having similar age tend to communicate more with each other and share experience; therefore, they are likely to have similar attitudes, thoughts, opinions, beliefs and hence, behaviour and decision-making. Additionally, they may experience the same historical events and social trends that form their life experiences and moral values. As a result, they tend to be mentally connected and similar minded.

Moreover, theories on Social Identity (Tajfel, 1974) and Self-categorisation (Turner et al., 1987) support the hypothesis that individual directors are more likely to classify themselves and other board members into different groups by employing personally meaningful dimensions which comprise of different demographic categories. This also has some implications of the age dissimilarity among board members, and in this study, between the Chair and the CEO. The (substantial) difference in age between these two highest positions of directors, one is the lead of the board of directors (Chair) and another is the lead of the executive board (CEO), may classify them into different groups with different viewpoints and less communications. By contrast, such differences can enhance the monitoring of directors to each other. Indeed, the age difference among them (Chair-CEO) leads to cognitive conflicts and thus positively influence their independence and monitoring quality (Goergen et al., 2015).

In general, all the above-mentioned theories possess one common view such that age dissimilarity between a Chairman and a CEO is likely to create more cognitive conflicts. Such stronger conflict may lead to higher Chair-CEO independence and monitoring quality.

### 2.3. Chair-CEO age dissimilarity, monitoring intensity and bank performance

The Chairman and the CEO are assigned for different corporate tasks within an institution. Particularly, the CEO is an executive agent who is responsible for the operations of the company as a whole. The traditional views on the objectives of the CEO are to maximize the shareholders' wealth. Nevertheless, according to the agency theory of Jensen and Meckling (1976), CEOs may conduct opportunistic behaviours to attain their self-interest at an expense of the shareholders. Consequently, the board of directors is formed as a governance layer of firms to monitor and oversee the behaviours and decisions of the CEOs. Chairman is the lead of the board who is in charge of monitoring CEOs and making final decisions. Therefore, it is expected that the Chair should maintain an optimal level of independence with the CEOs to ensure that the monitoring and overseeing board tasks are effectively completed. Similar age between board members may reduce board effectiveness as the board could be less cognitively independent such that decisions might not be critically evaluated under different viewpoints of executives (Goergen et al., 2015). Research on human psychology (*see e.g.*, Rhodes, 1983; Morris and Venkatesh, 2000; Kooij et al., 2011) argues that age-related dissimilarity could impact on an individual's work-related incentive, attitudes towards risks, decision-making and behaviour patterns. As mentioned earlier, a group including members with similar ages tends to have the same historical experience and values, fostering similar perceptions, attitudes and beliefs. Age difference hence may affect group processes, communication and cohesion (e.g., Rhodes, 1983; Zenger and Lawrence, 1989; Mehra et al., 1998). The Chair is a key person on the board, thus has substantial influence on board decisions. Greater age gap between the Chair and the CEO can lead to more intensive monitoring by two-fold: (i) higher cognitive conflicts, requiring the Chair to put more efforts to monitor the CEO, hence, increasing his attention on the CEO actions; (ii) lower information asymmetry, because the Chair tends to ask for more information from the CEO and in contrast, the CEO is likely to provide more useful information to persuade board of directors and the Chair to accept their plans and strategies. As such, the Chair and other board members are informed and reported more fully, whereby they can monitor the CEO more intensively (Adam and Ferreira, 2007). As a result, agency costs might be reduced, which is more beneficial to the banks due to their complex agency conflicts. Different ages encourage both the Chair and the CEO of a bank to behave more cautious to fulfil their legal and moral accountability. In addition, CEO actions depend on the age difference between them and the Chair's monitoring effectiveness. Lower age dissimilarity between the Chair and the CEO leads to deteriorating board of directors' monitoring quality, resulting higher agency problem; on the other hand, better monitoring effectiveness from the board (i.e., Age difference between the Chair and the CEO is substantial) can improve this issue through warning CEO actions.

Accordingly, we anticipate that (substantial) age dissimilarity may positively influence on the firm performance within banks, leading to our hypothesis:

**Hypothesis:** *There is a significant and positive relationship between the Chair-CEO age dissimilarity and bank financial performance*



### 3. Methodology, sample selection and descriptive statistics

#### 3.1. Methodology and measures

To examine the above hypothesis, we utilise the traditional Pooled Ordinary Least Square (OLS) with robust standard errors, which can address serial correlation and Heteroskedasticity. This method is widely used in previous corporate governance literature (e.g., Goergen et al., 2015; Pathan, 2009; Laeven and Levine, 2009; Berger et al., 2014; Minton et al., 2014). We, therefore, set the empirical base model as follows:

$$Performance_{i,t} = \beta_0 + \beta_1 \mathbf{Chair - CEO Age Gap}_{i,t} + \beta_2 \text{Group 1} + \beta_3 \text{Group 2} + \beta_4 \text{Group 3} + \beta_5 \text{Group 4} + \mu \text{Year effects} + \varepsilon_{i,t} \quad (1)$$

Where  $Performance_{i,t}$  represents for the banks' financial performance measured by their return on assets (ROA). It is the ratio between the net profit and the total assets of a bank (Elyasiani and Zhang, 2015; Gerged and Agwili, 2020; Leelhaphunt and Suntrayuth, 2020). This indicator allows managers to know how much the bank asset value has brought about so that changes can be made to increase profitability for the firm. In the sensitivity test, return on equity (ROE), which is the index between profits and shareholder's equity, is employed alternatively (Elyasiani and Zhang, 2015). It helps business owners acknowledge the profits they earned relative to the amount of money they have invested. Thus, the business owner may make appropriate adjustments to improve the index.

$\mathbf{Chair-CEO Age Gap}_{i,t}$  variable, which is the study's main independent variable representing the age difference between the Chair and the CEO of banks. The variable is measured by three alternative methods. First, a dummy variable is employed, which is set to 1 if the age difference between the Chair and the CEO (i.e.,  $\mathbf{Gap20 Chair-CEO}$ ) is at least 20 years (generational gap). In other words, 20 years is the cut-off for the generational gap, which is identified in sociology literature. With this sufficient gap, the viewpoint among individuals might be significantly different leading to higher monitoring of the Chairman and the CEO. This measure is consistent with the sociology literature (e.g., Strauss and Howe, 1997). We use a generational gap because cognitive conflicts between the Chair and the CEO might be strongest as both directors are from different generations (see Goergen et al., 2015). Second, we followed the previous work of Goergen et al. (2015) by using the chronological age difference between the Chair and the CEO (+/-) (i.e.,  $\mathbf{Chair-CEO age difference}$ ). It is calculated by subtracting the age of the CEO from the age of the Chair and then taking its square (i.e.,  $\mathbf{Squared Chair-CEO age difference}$ ). In this regard, it is imperative to consider that cognitive conflicts, but also communication problems, between two directors may not only arise when the Chair is considerably older than the CEO, but also when the Chair is younger than the CEO. If the linkage between  $\mathbf{Chair-CEO age difference}$  and bank performance is non-linear and if the sign of the age difference does not matter, only the  $\mathbf{Squared Chair-CEO age difference}$  is predicted to be significant. Lastly, we employ the absolute value of the age difference between the Chair and the CEO (i.e.,  $\mathbf{Chair-CEO age difference absolute}$ ). This proxy and the  $\mathbf{Gap20 Chair-CEO}$  are utilised in conjunction with a dummy measure of Chair Younger, which is set as 1 if the Chair is younger than CEO and 0 otherwise. According to the above argument, we will not anticipate a significance of this dummy variable.

We use a set of control variables which are widely used in previous corporate governance studies (e.g., Fich and Shivdasani, 2006; Fortin et al., 2010; Field et al., 2013; Minton et al., 2014; Elyasiani and Zhang, 2015). They are classified into four groups. The first group (Group 1) include *Chair Younger* variable which is a dummy variable taking the value of 1 if the Chair is younger than the CEO and otherwise 0; and *Board Gender* diversity measured by the percentage of female directors on the board (Goergen et al., 2015; Paweenawat, 2019). The second group (Group 2), which is Chair characteristics, comprises of *Chair Tenure* (capturing the Chair’s power, which is measured by the number of years the Chair has been serving on the board of directors) and *Busy Chair* (Binary variable, taking value of 1 if the Chair holds two or more additional directorships, 0 otherwise) (see Fich and Shivdasani, 2006). The third group (Group 3) of control variables includes CEO characteristics (see Goyal and Park, 2002; Adams et al., 2005; Pathan, 2009; Brookman and Thistle, 2009; Kaplan et al., 2012; Onali et al., 2016) such as *CEO Tenure* (CEO power, measured by the number of years the CEO has been serving as the firm’s CEO); *Busy CEO* (binary variable, taking value of 1 if the CEO holds two or more additional directorships, 0 otherwise). The final group (Group 4) captures the bank-level characteristics, including *Book Leverage* (Total debt divided by total assets) (see Goergen et al., 2015); and *Capital Expenditure* (capital expenditure of the bank divided by total assets) (see Goergen et al., 2015). Full definition description of those variables above is presented in Table 1. Furthermore, we use year dummy variables to control for year fixed-effect.

**Table 1:**

*Variable definition.* This table reports full definition description of all variables used in this study.

<b>Variable</b>	<b>Abbreviations</b>	<b>Definition</b>
Return on assets	<i>ROA</i>	Net profit over total assets
Return on equity	<i>ROE</i>	Net profit over total equity
Gap20 Chair-CEO	<i>Gap20 Chair-CEO</i>	Dummy variable, taking value of 1 if the age difference between the Chair and the CEO is at least 20 years (generational gap), 0 otherwise.
Chair-CEO age difference (+/-)	<i>Chair-CEO age difference</i>	The age of the Chair minus the age of the CEO. It could be positive or negative value.
Squared Chair-CEO age difference	<i>Squared Chair-CEO age difference</i>	Square of the age of the Chair minus the age of the CEO
Chair-CEO age difference absolute	<i>Chair-CEO age difference absolute</i>	the absolute value of the age difference between the Chair and the CEO
Chair Younger	<i>Chair Younger</i>	Dummy variable, taking the value of 1 if the Chair is younger than the CEO and otherwise 0
Board Gender diversity	<i>Board Gender</i>	The percentage of female directors on the board, measured by the number of female directors divided by the number of directors on board
Chair Tenure	<i>Chair Tenure</i>	The number of years the Chair has been serving on the board of directors
Busy Chair	<i>Busy Chair</i>	Dummy variable, taking value of 1 if the Chair holds two or more additional directorships, 0 otherwise
CEO Tenure	<i>CEO Tenure</i>	The number of years the CEO has been serving as the firm’s CEO

Busy CEO	<i>Busy CEO</i>	Dummy variable, taking value of 1 if the CEO holds two or more additional directorships, 0 otherwise
Book Leverage	<i>Book Leverage</i>	Total debt divided by total assets
Capital Expenditure	<i>Capital Expenditure</i>	Capital expenditure of the bank divided by total assets

### 3.2. Sample selection

We begin by gathering information on all listed commercial banks traded on London Stock Exchange (LSE) All-Share for each year for the period of 1989 to 2017. This results in an unbalanced panel of 243 bank-year observations for 22 banks. We excluded banks with full investment service because investment banks have different operations and products from their commercial counterparts, hence, including them into the sample can produce inconsistent results. However, we find that all 22 banks do not provide full-investment service. We also excluded from the sample any banks having less than three-year data availability. This leads to the exclusion of 4 bank-year observations. This leaves the sample with a final unbalanced panel consisting of 239 bank-year observations for 18 firms, covering approximately 90% of the market capitalisation of all LSE listed banks at the end of 2017. For Chair's and CEO's aging data, corporate governance variables (e.g., board size, board independence) and some bank-level data (e.g., bank age, bank size), they are hand-collected from individual annual reports which are published in their official websites, company filings (e.g., security prospectuses or governance reports). Any remaining gaps in the data (particularly age) are filled by retrieving information from Bloomberg database, which is also the source for other accounting and financial data of this study.

### 3.3. Descriptive statistics

Table 2 reports descriptive statistics for our dataset. Return on assets (ROA) is the main dependent variable while return on equity (ROE) is the alternative measure for bank performance. The mean (median) of ROA and ROE is 1.02 (0.776) and 10.607 (12.288), respectively. For the measures of age gap between the Chair and the CEO, we provide a descriptive of three alternative proxies, which are *Gap20 Chair-CEO*, *Chair-CEO age difference (+/-)* and *Chair-CEO age difference absolute*. The descriptive of the former shows that the Chair-CEO age generational gap (i.e., at least 20 years) accounts for 11.7% of all observations. Importantly, the absolute age difference between the Chair and the CEO is 10.4 years, relatively similar to the number (11.4 years) reported in the study of Goergen et al. (2015). The Chair is younger (*Chair Younger*) than the CEO for 10.5% of all observations. In addition, the women serving on the board accounts for 15.3% of all observations. In terms of Chair characteristics, average Chair tenure is 3.4 years. Furthermore, for 90% of all observations the Chair is serving in at least two outside boards. Turning to the CEO characteristics, for 64% of all observations the CEO is busy. Average CEO Tenure is 3.6 years. Moreover, the *book leverage* shows a mean of 4.6 which is greater than 1, implying that banks in our sample have a highly leveraged structure. Finally, the capital expenditures amount to 1.55% total assets.

**Table 2:**

*Summary statistics.* This table reports summary statistics of all variables used in the tested models. Definitions of those variables are provided in Table 1.

<b>Variables</b>	<b>N</b>	<b>mean</b>	<b>median</b>	<b>Std.</b>	<b>min</b>	<b>max</b>
ROA	239	1.020	0.776	1.791	-6.361	12.797
ROE	239	10.607	12.288	15.774	-141.453	72.906
<i>Gap20 Chair-CEO</i>	239	0.117	0	0.322	0	1
<i>Chair-CEO age difference absolute</i>	239	10.385	10	6.883	0	32
<i>Chair-CEO age difference (+/-)</i>	239	10.285	10	7.033	-5	32
Chair younger	239	0.105	0	0.307	0	1
Board gender diversity	239	0.153	0.143	0.096	0	0.4
Busy Chair	239	0.900	1	0.301	0	1
Chair Tenure	239	3.406	2	4.156	0	25
Busy CEO	239	0.640	1	0.481	0	1
CEO Tenure	239	3.556	3	3.657	-1	19
Book Leverage	239	4.639	3.712	3.571	0	20.415
CapEx/TA	239	0.016	0.000	0.015	-0.071	2.09

Pearson Pair-wise correlation matrix among independent variables employed in the models are presented in *Table 3*. All significant coefficients are within accepted range (<0.8), suggesting that multicollinearity will not be a problem of the study. We winsorise variables to control for outliers if any. Notes that pairs of variables (2-3) are not included in a single model. Their correlations are irrelevant for multicollinearity problems.

**Table 3:**

*Pearson Pair-wise Correlation Matrix.* The table presents the correlation matrix among all independent variables which are used in this study. All significant correlation coefficients are marked in bold (<5%). Variables definition is presented in Table 1.

	1	2	3	4	5	6	7	8	9	10	11
1. Gap20 Chair-CEO	1										
2. Chair-CEO age difference absolute	<b>0.660</b>	1									
3. Chair-CEO age difference (+/-)	<b>0.651</b>	<b>0.993</b>	1								
4. Chair Younger	-0.125	<b>-0.493</b>	<b>-0.524</b>	1							
5. Chair Tenure	0.078	0.041	0.039	0.069	1						
6. Busy Chair	0.055	-0.0603	-0.055	0.115	0.12	1					
7. Busy CEO	0.002	-0.123	<b>-0.129</b>	<b>0.199</b>	<b>0.185</b>	0.065	1				
8. CEO Tenure	<b>-0.180</b>	-0.107	-0.096	0.124	0.097	<b>0.547</b>	<b>0.136</b>	1			
9. Board gender	-0.010	0.097	0.100	-0.083	0.065	-0.039	-0.068	0.073	1		
10. Book Leverage	<b>-0.142</b>	-0.096	-0.101	<b>0.148</b>	0.022	<b>-0.159</b>	-0.056	-0.020	-0.071	1	
11. CapEx/TA	0.065	0.067	0.067	-0.035	0.034	-0.067	0.082	-0.023	-0.029	<b>-0.132</b>	1

## 4. Finding and analysis: Chair-CEO age dissimilarity and bank performance

### 4.1 Bivariate analysis

We initially consider the bivariate analysis for the association between Chair-CEO age dissimilarity and bank performance (i.e., ROA), which is presented in Table 4. All regressions adjust for year-fixed effects and show significantly positive coefficients on ROA across all three proxies of Chair-CEO age dissimilarity (i.e., *Gap20 Chair-CEO*; *Chair-CEO age difference absolute* and *Chair-CEO age difference*). These results suggest that the larger the age gap between the Chair and the CEO, the better the banking performance. This can be explained by the homophily theory which argues that different ages tend to enhance monitoring incentives and effectiveness of the Chair on the executive CEO. This prediction is more likely when applying for banks which have high demand for monitoring, consistent with agency theory.

**Table 4:**

Chair-CEO age dissimilarity and bank performance (ROA). This table reports bivariate analysis results of ROA on measures of age dissimilarity between the Chair and the CEO for listed LSE banks in the sample period 1989-2017. ROA is calculated as the return on total assets. Regressions (1) to (3) show the effects of different measures for age dissimilarity on ROA. *Gap20 Chair-CEO* is a binary variable taking value of 1 if the age difference between the Chair and the CEO is at least 20 years, 0 otherwise. *Chair-CEO age difference (+/-)* is the age difference between the Chair and the CEO, computed as the age of the Chair minus the age of the CEO. *Chair-CEO age difference absolute* is the absolute value of the age difference between the Chair and the CEO. The constant is included in all regressions.

VARIABLES	(1) ROA	(2) ROA	(3) ROA
<i>Gap20 Chair-CEO</i>	0.964** (0.011)		
<i>Chair-CEO age difference (+/-)</i>		0.051*** (0.001)	
<i>Chair-CEO age difference absolute</i>			0.052*** (0.002)
Constant	0.449*** (0.000)	-0.066 (0.677)	-0.068 (0.671)
Observations	239	239	239
R-squared	0.060	0.069	0.068

Robust p-value in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

However, bivariate analysis has its own limitation as no control variables are included to capture for other factors related to the firm performance. We, therefore, subsequently present the multivariate analysis results when all models include other relevant control factors. By capturing for other board, Chair and CEO characteristics, and bank-level variables, we expect to find more precise and reliable findings of the relationship between Chair-CEO age dissimilarity and bank performance.

### 4.2 Multivariate analysis

In this multivariate analysis, we include the sets of control variables introduced in Section 3.1. The regressions vary across alternative measures of Chair-CEO age dissimilarity (Models 1-4, Table 5). Table 5 presents the pooled Ordinary Least Square (OLS) with robust standard

errors and year-fixed effects results for the effect of Chair-CEO age dissimilarity and bank accounting-based performance. In the first regression (*Model 1*), we tested for the generational age gap between the Chair and the CEO, i.e., *Gap20 Chair-CEO*, and find that such measure has a significant and positive influence on the bank performance (*ROA*) at 1% significance level. This result is also obtained in the second and fourth regressions (Models 2 and 4) which employ *Chair-CEO age difference (+/-)* and *Chair-CEO age difference absolute* as main independent variables, respectively. These findings support for our *hypothesis* that a positive relationship between Chair-CEO age dissimilarity and bank performance is more likely and consistent with those found in bivariate analysis (*see* Section 4.1) as well as in prior studies (e.g., Goergen et al., 2015). This can be justified by homophily theory which argues that a (substantial) difference in aging between the Chair and the CEO, through their interaction (Ferris et al., 1991), tends to improve the monitoring effectiveness and incentives of the board of directors, and in turn, positively affect firm performance, especially firms with complex and high agency costs. In addition, the Chair-CEO age difference is likely to enhance the differentiation of views and thoughts as these two directors experience the similar historical events and social trends, and thus, increase their cognitive conflicts which encourages the Chair in scrutinising the CEO. The Chair, thus, may have different attitudes towards risks and religious beliefs which strengthen the monitoring activities of the Chair on the CEO's activities and decision-making (Goergen et al., 2015).

Regression 3 (*Model 3*) includes the signed age difference (+/-) as well as the square of *Chair-CEO age difference*. The purpose to include such a square variable is to test whether there is a non-linear relationship between the Chair-CEO age dissimilarity and bank performance. The result shows that while the simple *Chair-CEO age difference* is significant at 5%, its square becomes insignificant. This implies a linear association between age dissimilarity and *ROA*. Moving to the control variables across all models tested, we consistently find positive effects of *CEO Tenure* and *CapEx/TA* on the firm performance whilst the influences of *Chair Younger* and *Board Gender* diversity are significantly negative.

To sum up, there is consistently strong across all regression models that the Chair-CEO age difference is statistically and significantly related to greater firm profitability. Importantly and in line with our main hypothesis, a generational age gap between the Chair and the CEO are associated with high firm performance at 1%. The cognitive conflicts between these two directors should be strongest as they are from different generations which increases the monitoring incentives to each other (*see* Goergen et al., 2015).

**Table 5:**

Chair-CEO age dissimilarity and bank performance (*ROA*). This table presents multivariate analysis (i.e. Pooled Ordinary Least Square OLS) results of *ROA* on measures of age dissimilarity between the Chair and the CEO, other board and Chair/CEO characteristics, and bank-level factors for listed LSE banks in the sample period 1989-2017. *ROA* is calculated as the return on total assets. Regressions (1) to (4) show the effects of different measures for age dissimilarity on *ROA*. *Gap20 Chair-CEO* is a binary variable taking value of 1 if the age difference between the Chair and the CEO is at least 20 years, 0 otherwise. *Chair-CEO age difference (+/-)* is the age different between the Chair and the CEO, computed as the age of the Chair minus the age of the CEO. *Chair-CEO age difference absolute* is the absolute value of the age difference between the Chair and the CEO. All other control variables are presented in Table 1. Year-fixed effects and robust standard errors OLS are applied. The constant is included in all regressions.

VARIABLES	(1) ROA	(2) ROA	(3) ROA	(4) ROA
<i>Gap20 Chair-CEO</i>	0.910*** (0.003)			
<i>Chair-CEO age difference (+/-)</i>		0.051*** (0.000)	0.078** (0.019)	
<i>Squared Chair-CEO age difference</i>			-0.001 (0.387)	
<i>Chair-CEO age difference absolute</i>				0.050*** (0.000)
Chair younger	-0.512** (0.027)			-0.078 (0.753)
Busy Chair	0.205 (0.296)	0.193 (0.295)	0.185 (0.304)	0.198 (0.288)
Chair Tenure	0.025 (0.379)	0.038 (0.180)	0.041 (0.141)	0.039 (0.170)
Busy CEO	0.008 (0.961)	0.047 (0.774)	0.065 (0.689)	0.052 (0.748)
CEO Tenure	0.103*** (0.001)	0.082*** (0.004)	0.080*** (0.005)	0.082*** (0.004)
Book Leverage	0.558 (0.639)	0.171 (0.886)	0.136 (0.911)	0.158 (0.897)
Board Gender	-0.255*** (0.000)	-0.259*** (0.000)	-0.258*** (0.000)	-0.258*** (0.000)
CapEx/TA	0.053*** (0.000)	0.053*** (0.000)	0.053*** (0.000)	0.053*** (0.000)
Constant	0.233 (0.259)	-0.302 (0.206)	-0.482 (0.107)	-0.313 (0.199)
Year dummies	YES	YES	YES	YES
Observations	239	239	239	239
R-squared	0.562	0.566	0.567	0.566

Robust p-value in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 6. Sensitivities and Robustness Checks

### 6.1 The effect of financial crisis

We further investigate whether and how the financial crisis 2007-2009 influenced the association between Chair-CEO age dissimilarity and bank performance. The financial crisis is controlled because it constitutes an exogenous shock (see, e.g., Erkens et al., 2012). Despite our results (see Table 6, Models 1-3) are contradict with the findings of Goergen et al. (2015), we interestingly find that the financial crisis helps strengthen the positive effects of the Chair-CEO age dissimilarity on bank performance (i.e., positive coefficients on interactions between measures of age dissimilarity and financial crisis dummy variable). This can be reasonably explained by the fact that larger age difference among the Chair and the CEO decreases mutual attraction among them and hence, exhorts the cognitive independence of directors, leading to rising cognitive conflict (see e.g., McPherson et al., 2001; Forbes and Milliken, 1999; Amason, 1996). Therefore, during the fundamental period of financial crisis for banks, CEOs' decisions and their propounded actions might be monitored and reviewed more comprehensively and by



the Chair. In addition, CEOs may be required to submit and provide more useful information to persuade the board of directors and the Chair to accept their plan and strategy. Consequently, the Chair and other board members can be informed and reported more fully and effectively (Adam and Ferreira, 2007). This might be substantially beneficial to the banks when they encounter the crisis as the board of directors can access in-depth and complete information to evaluate more fully and accurately the current situation of their banks and as a result, promotes firm performance during crisis.

**Table 6:**

*The effect of financial crisis.* This table presents multivariate analysis (i.e. Pooled Ordinary Least Square OLS) results of ROA on measures of age dissimilarity between the Chair and the CEO, other board and Chair/CEO characteristics, and bank-level factors for listed LSE banks in the sample period 1989-2017. ROA is calculated as the return on total assets. Regressions (1) to 3) show the effects of different measures for age dissimilarity on ROA. *Gap20 Chair-CEO* is a binary variable taking value of 1 if the age difference between the Chair and the CEO is at least 20 years, 0 otherwise. *Chair-CEO age difference (+/-)* is the age different between the Chair and the CEO, computed as the age of the Chair minus the age of the CEO. *Chair-CEO age difference absolute* is the absolute value of the age difference between the Chair and the CEO. Financial crisis is a dummy variable taking value of 1 if the observed year is 2007, 2008 or 2009. All other control variables are presented in Table 1. Year-fixed effects and robust standard errors OLS are applied. The constant is included in all regressions.

VARIABLES	(1) ROA	(2) ROA	(3) ROA
<i>Gap20 Chair-CEO</i>	0.907*** (0.005)		
<i>Chair-CEO age difference (+/-)</i>		0.041*** (0.001)	
<i>Chair-CEO age difference absolute</i>			0.043*** (0.001)
Financial Crisis	1.581*** (0.004)	0.767* (0.051)	0.727* (0.096)
<i>Gap20 Chair-CEO</i> * Financial Crisis	0.059 (0.926)		
<i>Chair-CEO age difference absolute</i> * Financial Crisis			0.102** (0.033)
<i>Chair-CEO age difference</i> * Financial Crisis		0.101** (0.025)	
Chair younger	-0.512** (0.028)		0.022 (0.930)
Busy Chair	0.204 (0.296)	0.142 (0.428)	0.148 (0.414)
Chair Tenure	0.025 (0.378)	0.041 (0.136)	0.042 (0.132)
Busy CEO	0.009 (0.959)	0.087 (0.589)	0.087 (0.587)
CEO Tenure	0.103*** (0.001)	0.077*** (0.007)	0.077*** (0.007)
Board Gender	0.557 (0.642)	-0.026 (0.982)	-0.021 (0.986)
Book Leverage	-0.255*** (0.000)	-0.266*** (0.000)	-0.267*** (0.000)
CapEx/TA	0.053*** (0.000)	0.053*** (0.000)	0.054*** (0.000)
Constant	0.233	-0.185	-0.209

	(0.260)	(0.404)	(0.357)
Year dummies	YES	YES	YES
Observations	239	239	239
R-squared	0.562	0.577	0.577

Robust p-value in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 6.2 Alternative measure for bank performance

To check whether the results changed when using different measures for bank performance, we additionally re-tested all the main regressions by replacing ROA by its alternative measure (return on equity – ROE) – see Table 7 (Models 1-4). This measure appears to better reflect the increase or decrease in the wealth of shareholders. Using the same method and same sets of control variables, we find that the main results achieved from Table 5 remained unchanged and hence, our story is strongly supported by both ROA and ROE. In unreported results, we also replace ROA by the firm market capitalisation (share prices multiplied by the number of share outstanding) and Tobin’s Q which represented for the stock market value, the beneficial effects of age difference between the Chair and the CEO are still revealed, consistent with the findings of Goergen et al. (2015). All results (main and sensitivity tests) provide strong support for the fact that when the need for monitoring of the board (e.g., *via* the Chair) on the managers’ (CEOs’) activities increases (e.g., the cases of banks), the positive impacts of age (substantial) difference between the Chair and the CEO have more chances to exhibit, and in turn, enhance firm profitability as well as firm value.

### Table 7:

*Sensitivity tests: Chair-CEO age dissimilarity and bank performance (ROE).* This table presents multivariate analysis (i.e. Pooled Ordinary Least Square OLS) results of ROE on measures of age dissimilarity between the Chair and the CEO, other board and Chair/CEO characteristics, and bank-level factors for listed LSE banks in the sample period 1989-2017. ROE is calculated as the return on total equity. Regressions (1) to (4) show the effects of different measures for age dissimilarity on ROE. *Gap20 Chair-CEO* is a binary variable taking value of 1 if the age difference between the Chair and the CEO is at least 20 years, 0 otherwise. *Chair-CEO age difference (+/-)* is the age different between the Chair and the CEO, computed as the age of the Chair minus the age of the CEO. *Chair-CEO age difference absolute* is the absolute value of the age difference between the Chair and the CEO. All other control variables are presented in Table 1. Year-fixed effects and robust standard errors OLS are applied. The constant is included in all regressions.

VARIABLES	(1) ROE	(2) ROE	(3) ROE	(4) ROE
<i>Gap20 Chair-CEO</i>	9.870*** (0.001)			
<i>Chair-CEO age difference (+/-)</i>		0.378** (0.040)	0.408 (0.450)	
<i>Squared Chair-CEO age difference</i>			-0.001 (0.941)	
<i>Chair-CEO age difference absolute</i>				0.294** (0.044)
Chair younger	-6.191 (0.225)			-4.084 (0.400)
Busy Chair	-0.069 (0.978)	0.430 (0.866)	0.421 (0.869)	0.706 (0.776)
Chair Tenure	-0.077 (0.709)	0.039 (0.851)	0.042 (0.830)	0.061 (0.760)

Busy CEO	0.476 (0.786)	0.533 (0.781)	0.554 (0.761)	0.835 (0.638)
CEO Tenure	1.381*** (0.001)	1.095*** (0.005)	1.094*** (0.004)	1.092*** (0.005)
Board Gender	7.444 (0.577)	1.702 (0.894)	1.662 (0.898)	0.268 (0.984)
Book Leverage	-1.372** (0.021)	-1.417** (0.032)	-1.416** (0.030)	-1.360** (0.025)
CapEx/TA	0.113** (0.039)	0.117** (0.041)	0.117** (0.040)	0.117** (0.047)
Constant	8.339*** (0.009)	4.306 (0.151)	4.107 (0.263)	4.449 (0.136)
Year dummies	YES	YES	YES	YES
Observations	239	239	239	239
R-squared	0.368	0.346	0.346	0.350

Robust p-value in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### 6.3 Adding more control variables

We additionally control for more variables including CEO age, Log of Board Size, Board independence, Log of Total Assets and Log of Bank Age. CEO age is measured by the difference between the observed year and CEO's birth year. Log of Board size is calculated as the natural logarithm form of the number of directors serving on board, while board independence represents the percentage of independent directors on board. Log of Total Assets and Log of Bank Age represent the bank size and bank age which are measured by the natural logarithm form of total assets and bank age (difference between the first time the bank appeared and the observed year). Table 8 reports results after we include all these control variables into our empirical models to capture for CEO age as highlighted in literature (e.g., Serfling, 2014), corporate governance quality and bank-level characteristics (e.g., Singh et al., 2019; Elnahass et al., 2020a. b; Trinh et al., 2020a; Trinh et al., 2020d). They are potentially determinants of bank performance in our empirical setting. We find that our main results are unchanged even if we add more control variables. The signs of controls are consistent with previous studies.

**Table 8:**

Chair-CEO age dissimilarity and bank performance (ROA). This table presents multivariate analysis (i.e. Pooled Ordinary Least Square OLS) results of ROA on measures of age dissimilarity between the Chair and the CEO, other board and Chair/CEO characteristics, and bank-level factors for listed LSE banks in the sample period 1989-2017. ROA is calculated as the return on total assets. Regressions (1) to (4) show the effects of different measures for age dissimilarity on ROA. *Gap20 Chair-CEO* is a binary variable taking value of 1 if the age difference between the Chair and the CEO is at least 20 years, 0 otherwise. *Chair-CEO age difference (+/-)* is the age different between the Chair and the CEO, computed as the age of the Chair minus the age of the CEO. *Chair-CEO age difference absolute* is the absolute value of the age difference between the Chair and the CEO. Year-fixed effects and robust standard errors OLS are applied. The constant is included in all regressions.

VARIABLES	(1) ROA	(2) ROA	(3) ROA	(4) ROA
<i>Gap20 Chair-CEO</i>	0.279*** (0.000)			
<i>Chair-CEO age difference (+/-)</i>		0.044***	0.011**	

		(0.000)	(0.012)	
<i>Squared Chair-CEO age difference</i>			-0.001	
			(0.502)	
<i>Chair-CEO age difference absolute</i>				0.038***
				(0.000)
Chair younger	-1.289***	-1.829***	-1.637***	-1.685***
	(0.002)	(0.000)	(0.001)	(0.000)
Busy Chair	0.395*	0.496**	0.482**	0.463**
	(0.090)	(0.033)	(0.035)	(0.040)
Chair Tenure	0.048	0.046	0.045	0.046
	(0.317)	(0.312)	(0.325)	(0.312)
Busy CEO	0.119	0.105	0.104	0.113
	(0.536)	(0.569)	(0.577)	(0.543)
CEO Tenure	0.064**	0.062**	0.060**	0.062**
	(0.025)	(0.023)	(0.026)	(0.025)
CEO Age	-0.001	-0.001	-0.001	-0.001
	(0.387)	(0.300)	(0.343)	(0.312)
Log of Board Size	0.016	0.016	0.017	0.016
	(0.406)	(0.382)	(0.349)	(0.387)
Board Independence	-1.120*	-1.349**	-1.387**	-1.344**
	(0.075)	(0.042)	(0.040)	(0.044)
Book Leverage	-0.111***	-0.092**	-0.095**	-0.095**
	(0.003)	(0.013)	(0.011)	(0.012)
Board Gender	1.010	0.935	0.971	0.977
	(0.360)	(0.371)	(0.357)	(0.350)
CapEx/TA	0.032***	0.030***	0.030***	0.030***
	(0.000)	(0.000)	(0.000)	(0.000)
Log of Total Assets	0.279***	0.304***	0.301***	0.303***
	(0.000)	(0.000)	(0.000)	(0.000)
Log of Bank Age	0.002*	0.002*	0.002*	0.002*
	(0.089)	(0.052)	(0.063)	(0.059)
Constant	3.326***	4.086***	3.858***	4.037***
	(0.000)	(0.000)	(0.000)	(0.000)
Year dummies	YES	YES	YES	YES
Observations	236	236	236	236
R-squared	0.741	0.751	0.752	0.749

Robust pval in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

#### 6.4 Potential endogeneity concerns and the Two-step system Generalized Method of Moments

This additional test solves two types of endogeneity concerns. The first is the unobserved Chair and CEO heterogeneity. Indeed, certain Chair and CEO characteristics are likely to be significantly correlated with our measures for the Chair-CEO age dissimilarity which can result in spurious regression findings. For instance, the *Gap20 Chair-CEO* measure can be correlated with the Chair's and the CEO's prior industry and management experience. Although we have tried to include some Chair and CEO experience measures such as Chair and CEO Tenure and whether they are busy or not, we do not fully control for other experience and other time-invariant heterogeneity. The second endogeneity concern is the dynamic endogeneity (Goergen et al., 2015) which refers to previous realisations of the dependent variable influencing current levels of some or all of the explanatory variables (Wintoki et al., 2012). While past board structure may influence current bank performance, current board structure may also be a result

of past bank performance (Wintoki et al., 2012). Specially, poor profitability in the past might cause a substantial change in board members (e.g., replacing young Chair by an older one). To partially solve this problem, we followed the design of Goergen et al. (2015) and other corporate governance studies (e.g., Pathan, 2009), to apply the Two-step system Generalized Method of Moments (GMM) (e.g., Blundell and Bond, 1998). As can be seen from Table 9 (Models 1-4), GMM results are still consistent with the main results obtained from traditional POLS technique, suggesting that our findings are not driven by omitted variable bias, heterogeneity and/or dynamic endogeneity issues. We, consistently, conclude that across different measures of dependent and independent variables as well as across different model specifications, Chair-CEO age difference is likely to be positively associated with high profitability (ROA, ROE and even firm stock market value).

**Table 9:**

*Dynamic panel data models (system GMM estimations).* This table presents results of the dynamic, system GMM regressions of ROA on measures of age dissimilarity between the Chair and the CEO, other board and Chair/CEO characteristics, and bank-level factors for listed LSE banks in the sample period 1989-2017. ROA is calculated as the return on total equity. Regressions (1) to (4) show the effects of different measures for age dissimilarity on ROA. *Gap20 Chair-CEO* is a binary variable taking value of 1 if the age difference between the Chair and the CEO is at least 20 years, 0 otherwise. *Chair-CEO age difference (+/-)* is the age different between the Chair and the CEO, computed as the age of the Chair minus the age of the CEO. *Chair-CEO age difference absolute* is the absolute value of the age difference between the Chair and the CEO. All other control variables are presented in Table 1. Year-fixed effects and robust standard errors GMM are applied. The constant is included in all regressions. Running the dynamic panel estimations, all results remain unchanged compared to main results in Table 4. Both, AR (1) and AR (2), are tests for first-order and second-order autocorrelation. The Hansen test of over-identification is based on the null hypothesis that all instrumental variables (IVs) are valid. All results for these tests suggest a satisfaction of models' diagnostics which might produce reliable findings.

VARIABLES	(1) ROA	(2) ROA	(3) ROA	(4) ROA
Lagged of ROA	0.402*** (0.001)	0.405*** (0.000)	0.519*** (0.000)	0.405*** (0.000)
<i>Gap20 Chair-CEO</i>	0.618* (0.087)			
<i>Chair-CEO age difference (+/-)</i>		0.034*** (0.005)	0.085* (0.079)	
<i>Squared Chair-CEO age difference</i>			-0.002 (0.144)	
<i>Chair-CEO age difference absolute</i>				0.034*** (0.005)
Chair younger	-0.383 (0.204)	-0.068 (0.778)	0.222 (0.555)	-0.097 (0.702)
Busy Chair	0.112 (0.462)	0.080 (0.568)	0.108 (0.462)	0.083 (0.549)
Chair Tenure	0.015 (0.577)	0.026 (0.266)	0.025 (0.179)	0.026 (0.258)
Busy CEO	-0.104 (0.496)	-0.092 (0.495)	-0.061 (0.628)	-0.090 (0.507)
CEO Tenure	0.060* (0.082)	0.047 (0.101)	0.033 (0.280)	0.047* (0.099)
Book Leverage	-0.040 (0.969)	-0.312 (0.803)	-0.210 (0.830)	-0.316 (0.801)
Board Gender	-0.152***	-0.151***	-0.130**	-0.151***

	(0.003)	(0.002)	(0.011)	(0.001)
CapEx/TA	0.026**	0.032**	0.020*	0.032**
	(0.010)	(0.015)	(0.078)	(0.015)
Constant	1.174*	-0.598	1.015**	1.074
	(0.066)	(0.414)	(0.015)	(0.100)
Year dummies	YES	YES	YES	YES
Observations	221	221	221	221
Number of BANK	18	18	18	18
Wald Chi (p-value)	0.000	0.000	0.000	0.000
AR(1) (p-value)	0.030	0.027	0.031	0.027
AR(2) (p-value)	0.758	0.596	0.789	0.585
Hansen test for over-identification (p-value)	0.138	0.185	0.803	0.184

Robust p-value in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 7. Conclusion

Previous studies have highlighted the fundamental role of the Chair on corporate boards under either one-tier or two-tier governance systems. However, few studies focus on how the Chair characteristics influence bank governance effectiveness. Also, no efforts to date are conducted for the LSE listed commercial banks on the determinants of the important association between the Chair and the CEO. Under the acknowledgement that banks are unique, opaque, and more complex than non-financial and other financial firms in terms of activities, products and governance mechanisms, they are likely to have higher monitoring needs from the board of directors, especially from its Chair, on managers. This study, therefore, emphasises the Chair-CEO relation and how it can influence bank financial performance. We hypothesise that the (substantial) age difference between the Chair and the CEO leads to cognitive conflict between them, which in turn, results in more intensive scrutinising of the latter and ultimately greater profitability. To test this hypothesis, we examine the effect of the Chair-CEO age dissimilarity on bank performance. Our estimated sample of LSE banks considerably reduces endogeneity concerns as a steadily increasing number of firms and banks in this country are abandoning CEO duality (Goergen et al., 2015).

We find strong evidence that a higher Chair-CEO age difference (particularly, a generational age gap) is likely to increase bank performance. This finding supports the main hypothesis and remains relatively stable across all alternative measures for dependent and independent variables as well as across alternative model specifications (before and after controlling for omitted variable bias, heterogeneity and dynamic endogeneity issues). We find that a financial crisis helps strengthen the positive effects of the Chair-CEO age dissimilarity on bank performance. This is consistent with the view that a larger age difference among the Chair and the CEO might be substantially beneficial to a bank when they encounter a crisis, as the board of directors might be provided better information from the CEO to help them evaluate fully their bank's situation, find sound solutions and promote firm performance. The insights of our study are valuable to banks and their shareholders as they can give them a profound understanding and awareness of the optimal Chair-CEO.

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