

Is chair-CEO generational difference a substitute governance mechanism to debt financing?

Yee Peng Chow

*Tunku Abdul Rahman University of Management and Technology,
Kuala Lumpur, Malaysia*

378

Received 13 February 2023
Revised 3 August 2023
22 January 2024
5 March 2024
10 May 2024
Accepted 1 July 2024

Abstract

Purpose – The purpose of this paper is to examine whether and how chair-chief executive officer (CEO) generational difference is related to debt financing.

Design/methodology/approach – This paper adopts the pooled ordinary least squares and system generalized method of moments estimation procedures to analyze listed firms in Malaysia from 2013 to 2017.

Findings – The results reveal that chair-CEO generational difference is negatively associated with leverage. The evidence suggests that substantial age gaps between the chair and CEO precipitate cognitive conflicts, which lead to better monitoring and control. This results in better governance and less information asymmetry, causing firms to depend less on debt as a board monitoring mechanism. The findings provide support to the theory posited in this paper on the substitutability of chair-CEO generational difference and debt financing.

Originality/value – This is the first attempt to investigate the substitutability of chair-CEO generational difference and debt financing.

Keywords Age heterogeneity, Chair-CEO generational difference, Corporate governance, Debt financing, Leverage

Paper type Research paper

1. Introduction

According to agency theory, shareholders appoint managers to operate the firm on their behalf and agency problem, in particular agency cost of equity, resulting from the expropriation of shareholder wealth by managers may emerge from the demarcation between ownership and control. Agency theory (Jensen and Meckling, 1976) and the theory of agency costs of free cash flow (Jensen, 1986) have proposed using debt financing as a governance mechanism to mitigate agency cost of equity. Also known as the “control hypothesis” for debt creation, Jensen (1986) contends that debt restricts managerial flexibility, where it constrains managers’ control over the firm’s cash flow and their tendency to engage in non-optimal activities because firms are committed to periodic debt repayments. Additionally, managers are forced to reduce their perquisites and take measures to minimize bankruptcy risk and loss of reputation and control. Stated differently, these theories conjecture that debt may effectively alleviate agency conflicts [1].

Meanwhile, corporate governance (CG) mechanisms are also devised to mitigate agency problem (Chaudhary, 2022; Faysal *et al.*, 2020). Board characteristics are among the prominent CG aspects that have been well-studied (Salehi *et al.*, 2023; Faysal *et al.*, 2021). A critical aspect of board characteristics is its members’ composition, where a diverse board



which contains directors with varying demographic attributes, experiences and skills may enhance board independence and monitoring and contribute positively to board performance (Nisiyama and Nakamura, 2018). Recent studies on board diversity have also explored the association between board members' demographics and attributes and debt financing (Adusei and Obeng, 2019; Nisiyama and Nakamura, 2018).

Although age is a vital dimension of diversity, this aspect has received scant attention in the finance and CG literature, especially in relation to board leadership structure. Researchers (Zhou *et al.*, 2019; Goergen *et al.*, 2015) suggest that chair-CEO age dissimilarity, especially across different generations, may serve as an effective board monitoring mechanism. This is supported by two underlying theories, i.e. the upper echelons and homophily theories. According to the upper echelons theory, corporate decisions may be significantly influenced by the top management team's (TMT) background characteristics, including age difference. Meanwhile, the homophily theory posits that chair-CEO age heterogeneity may precipitate cognitive conflicts due to differences in values, beliefs, experience and attitudes between the older chair and younger CEO or vice versa. These may culminate into more intense board monitoring, where the decisions and proposed measures by the CEO are subject to more scrutiny and questioning by the board of directors (BOD) (Talavera *et al.*, 2018). Hence, chair-CEO generational difference, as a source of governance mechanism to alleviate agency cost of equity, has recently emerged as a new avenue of research.

Based on the preceding discussions, it can be observed that debt financing and chair-CEO generational difference may serve as substitute governance mechanisms to overcome agency cost of equity. This notion is supported by the substitutability theory in the agency context which postulates that when one governance mechanism acts as a substitute for another mechanism, there is a direct functional replacement of the first mechanism with the second one, while preserving the governance system's overall functionality (Ward *et al.*, 2009). Agency theory further conjectures that leverage and CG are substitutes (Jensen and Meckling, 1976). Debt mitigates agency cost of equity by controlling managers' flexibility to use free cash flows (Jensen, 1986). CG also serves as a mechanism for overcoming agency cost of equity. Extant empirical literature has also documented evidence of the substitutability of leverage and CG as governance mechanisms (Tekin and Polat, 2023; Zhou *et al.*, 2021).

This study draws on the evidence from an emerging economy, i.e. Malaysia, where the country is well-suited for this research due to several reasons. In terms of debt financing, Malaysia possesses relatively well-functioning capital markets that enable prices of financial assets, including debt instruments, to be determined by market forces and firms could raise debt financing easily (Matemilola *et al.*, 2017). As regards CG, the Malaysian Code on Corporate Governance (MCCG), first initiated in 2000, recommends the best CG practices for Malaysian firms. Among others, it recommends the composition and proper functioning of the BOD and how board members should be chosen, which should consider their demographic profiles including age structure. Besides, consistent with the on-going global trend in CG practices, the MCCG also recommends that there should be role separation between the chair and CEO [2]. Collectively, these developments should promote better board effectiveness.

Given the robust developments in both the debt markets and CG in Malaysia, this raises pertinent questions as to whether chair-CEO age heterogeneity, in particular generational difference, can substitute other CG mechanisms, especially debt financing. Hence, Malaysia serves as a suitable laboratory to explore the importance of promoting diversity in the BOD and TMT, particularly in relation to chair-CEO relative age. This may, in turn, prompt policymakers to further strengthen age-related policies. Moreover, this may assist investors in their investment decisions, by considering alternative CG practices adopted by firms, especially debt financing or having chair and CEO with substantial age dissimilarity.

Despite this, this study contends that there remain research gaps that need to be addressed. First, to date very little has been discovered regarding the relationship between chair-CEO age heterogeneity, in particular generational difference, and debt financing. For instance, [Goergen et al. \(2015\)](#) investigate the influence of chair-CEO age heterogeneity on firm value, while [Zhou et al. \(2019\)](#) analyze its effect on banks' risk-taking behavior. Nonetheless, no research has investigated its association with debt financing. Second, past studies on chair-CEO age heterogeneity are conducted on advanced economies. This paper asserts that emerging economies such as those in Asia-Pacific, possess relatively less developed financial markets, poorer corporate legal enforcement and weaker institutions than advanced economies ([Salehi and Salami, 2020](#); [Chow et al., 2018](#); [Salehi et al., 2018b](#)). In these countries, debt acts as an important governance tool due to information asymmetry and divergence in stakeholders' utility function problems ([Berke-Berga and Dovladbekova, 2019](#)). Moreover, in countries where firms have higher ownership concentration (e.g. emerging markets), debt financing plays a more critical role than in countries where firm ownership is dispersed (e.g. advanced markets). Such disparities in ownership structure may result in differential impact of internal CG on firms' financing choices ([Salehi et al., 2017](#)). Therefore, the applicability of the evidence based on advanced economies to emerging markets remains unexplored.

This paper aims to address these research voids by examining the substitutability of debt and chair-CEO generational difference based on evidence of Malaysian listed firms from 2013 to 2017. This study finds an inverse association between chair-CEO generational difference and leverage [3]. The findings demonstrate that substantial chair-CEO age difference precipitates cognitive conflicts, which lead to improved control and monitoring. This results in better governance and less information asymmetry, which reduce the reliance on debt as a board monitoring mechanism. The findings are consistent with the theory postulated in this paper on the substitutability of chair-CEO generational difference and debt financing.

This research contributes along several lines. First, this paper provides initial evidence on how chair-CEO generational difference is related to debt financing. Literature examining on chair-CEO age heterogeneity is extremely scant. However, prior studies did not explore its relationship with debt financing. A focus on chair-CEO age heterogeneity, especially generational difference, is crucial to shed light on its potential to substitute debt as an alternative governance mechanism. Second, while previous studies on chair-CEO age heterogeneity are concentrated on advanced economies, the present research is performed in an emerging market context to broaden our understanding about the substitutability of chair-CEO generational difference and debt financing.

2. Literature review and hypothesis development

2.1 Theoretical framework

According to the agency model of the firm, agency problems may arise from the expropriation of shareholder wealth by managers when there is separation between the firm's decision-making and risk-bearing functions ([Jensen and Meckling, 1976](#)). Since common shareholders as the firm's owners are dispersed and hold well-diversified portfolios, they have to delegate the power to formulate corporate decisions to the managers. Nonetheless, these managers may be inclined to prioritize their own interest, which is in conflict with the common shareholders' interest. This conflict results in the agency cost of equity.

The substitutability theory in the agency context posits that when one governance mechanism serves as a substitute for another mechanism, there is a direct functional replacement of the former with the latter, while maintaining the governance system's overall functionality ([Ward et al., 2009](#)). Consistent with this notion, agency theory conjectures that leverage and CG are substitutes ([Jensen and Meckling, 1976](#)). Debt mitigates agency cost of

equity by restricting managers' flexibility to utilize free cash flows (Jensen, 1986). CG also serves as a mechanism for reducing agency cost of equity. Hence, both debt and CG are adopted to discipline managers, implying their roles as substitutes.

Agency theory (Jensen and Meckling, 1976) and the theory of agency costs of free cash flow (Jensen, 1986) propose the use of debt financing as an effective technique to alleviate agency cost of equity. Also referred to as the "control hypothesis" for debt creation, Jensen (1986) asserts that debt reduces managers' control over the firms' cash flow and their tendency to engage in non-optimal activities such as suboptimal investments because firms are committed to make periodic debt repayments. Instead, these cash flow obligations may encourage managers to use the firms' resources in a more productive and profitable manner to enhance firm value, which is in congruence with shareholders' financial objective.

Furthermore, managers are forced to reduce their perquisites and adopt efficient measures to minimize bankruptcy risk and loss of reputation and control. The covenants in the debt contracts typically provide creditors with the right to closely monitor the managers. For instance, managers have to meet the minimum thresholds related to the firms' operating and financial performance. Failure to comply may result in creditors instituting legal actions towards these firms, which ultimately may lead to bankruptcy and threaten managers' compensation and job security. Accordingly, debt may act as a governance mechanism to discipline managers and alleviate agency cost of equity and agency cost of free cash flow (Jensen, 1986).

Turning to CG research, board members' independence is ascertained by whether or not they have any business ties with other board members. It is, however, contended that this traditional way of determining board independence may not fully capture the potential influence of board social independence, i.e. informal social ties shared among board members (Zhou *et al.*, 2019). Fracassi and Tate (2012) further maintain that such informal social ties are against shareholders' best interest because they may compromise the board's monitoring effectiveness.

The development of informal social ties can be explained by two underlying theories, i.e. upper echelons and homophily. Upper echelons theory conjectures that corporate decisions may be significantly influenced by TMT's background characteristics such as differences in gender, age, education, experience and functional background (Salehi *et al.*, 2018a, c; Hambrick and Mason, 1984). Such demographic diversity affects group decision-making and may adversely influence group cohesion and exacerbate cognitive conflicts among members (Choi and Sy, 2010).

Meanwhile, homophily theory postulates that there is a strong tendency for individuals to select and communicate with people who have similarities with themselves (McPherson *et al.*, 2001). For example, board members belonging to the same age group are expected to share similar beliefs, behaviors and attitudes and these commonalities facilitate communication and group work. Along this line, age heterogeneity stimulates healthy disagreement and cognitive conflicts in organizations (Choi and Sy, 2010). Heterogeneous groups are more effective in solving problems due to their diverse perspectives and opinions and they are compelled to perform a more thorough analysis of the issues faced and consequently, better decisions will come to fruition (Talavera *et al.*, 2018). Conversely, homogeneity alleviates cognitive conflicts but produces less optimal corporate decisions.

Taken together, board members with similar demographic attributes or backgrounds may display more informal social ties or lower board social independence, which will result in less effective board monitoring and weaker CG. For instance, firms where the CEOs have greater social bonds with the directors incur higher internal agency costs and pursue short-termism via short-term debt financing (Oware *et al.*, 2023). On the flip side, diversity in demographic attributes such as chair-CEO age heterogeneity, especially generational difference, precipitates cognitive conflicts between both individuals. This leads to more

intense board monitoring, where the proposed solutions and decisions by the CEO are subject to greater scrutiny and probing by the BOD (Zhou *et al.*, 2019; Goergen *et al.*, 2015). Hence, age heterogeneity, in particular chair-CEO generational difference, may serve as a CG mechanism to alleviate agency cost of equity.

2.2 The substitutability of debt and chair-CEO generational difference as governance mechanisms

Extant literature has documented evidence on the role of debt as a governance mechanism. For example, Nini *et al.* (2012) document the governance role of creditors, where violations in debt covenants will result in more stringent restrictions in the credit agreement and TMT restructuring. Choi *et al.* (2016) demonstrate the role of debt as a governance mechanism in achieving a balance between exploration, by promoting innovation, and exploitation, by preventing managers from engaging in suboptimal exploration. Salehi *et al.* (2017) find that a higher amount of stock ownership held by the management increases managerial entrenchment and agency problems and debt financing is utilized as a governance mechanism to address these issues. Although Farhangdoust *et al.* (2020) hypothesize a negative relationship between managerial ownership and debt because both may serve as substitute governance mechanisms, the findings reveal that there is no trade-off between these variables. Ghorbani and Salehi (2021) report that firms that engage in more earnings management have higher leverage, which is utilized to discipline managers. Ariyono and Setiyono (2020) find that the number of bank creditors is negatively related to agency conflict. They conclude that due to weak investor protection in developing countries such as Indonesia, bank creditors still monitor their borrowers closely despite the existence of other creditors.

Prior empirical literature has also furnished evidence on the role of chair-CEO generational difference as a CG mechanism. For instance, Goergen *et al.* (2015) find that substantial age gaps, especially generational difference, between the chair and CEO restrict the development of social ties and enhance board monitoring effectiveness, which improve firm value. Zhou *et al.* (2019) reveal that chair-CEO age dissimilarity mitigates banks' excessive risk-taking behavior. Zhu *et al.* (2023) document that greater chair-CEO age dissimilarity leads to more board monitoring and higher firm value. Azzam and Alhababsah (2023) report a negative association between chair-CEO age similarity and R&D investments, which suggest that the former minimizes cognitive conflict and results in poor monitoring. By contrast, Chow (2023) finds that chair-CEO demographic dissimilarities, including age heterogeneity, give rise to conflicting cognitive styles, which result in poor communication and inability to cooperate. Ultimately, the firms' ability to pursue internationalization is jeopardized.

Besides, previous studies have demonstrated the substitutability of leverage and CG as governance mechanisms. For example, Arping and Sautner (2010) reveal that firms use less leverage following improvements in CG, implying that CG substitutes debt as a governance mechanism. Berke-Berga and Dovladbekova (2019) report a negative relationship between CG quality and leverage, indicating that both serve as substitute governance mechanisms. Bharath and Hertzfel (2019) find that a decline in CG quality leads to an increased reliance in alternative governance mechanisms such as creditor governance from bank borrowing. Zhou *et al.* (2021) document the negative effect of improved CG on leverage, which supports the substitutability of CG and leverage. Tekin and Polat (2023) report that debt acts as a substitute for governance prior to the global financial crisis (GFC). Conversely, debt serves as an outcome of the governance mechanism during and post-GFC.

Notwithstanding the preceding arguments, to date very little is known regarding the association between chair-CEO age heterogeneity, especially generational difference and

leverage. For instance, Wang *et al.* (2021) analyze the effect of chair-CEO power gap on debt financing and discover that firms with wider power gaps undertake more debt financing. Comino-Jurado *et al.* (2021) find a negative association between generational stage and debt financing, where the second and subsequent generations prefer to use less debt to prevent losing family control. Nonetheless, extant research has not explored the substitutability of chair-CEO age heterogeneity and debt as governance mechanisms to alleviate agency cost of equity.

Additionally, the majority of previous studies on the effect of chair-CEO age heterogeneity are performed on advanced economies such as Germany (Goergen *et al.*, 2015) and Europe (Zhou *et al.*, 2019). There is, however, a dearth of research being performed based on emerging economies. Emerging economies such as those in the Asia-Pacific, face more complex agency conflicts due to their weak corporate legal enforcement and institutional development (Chow *et al.*, 2018). In these countries, debt serves as an important governance device because of information asymmetry and divergence in stakeholders' utility function issues (Berke-Berga and Dowladbekova, 2019). Besides, in countries where firms have higher ownership concentration (e.g. emerging markets), debt financing plays a more crucial role than in countries with more dispersed firm ownership (e.g. advanced markets). Such disparities in ownership structure may result in differential impact of internal CG on firms' financing choices (Salehi *et al.*, 2017). Thus, the applicability of the results based on advanced economies to emerging markets remains an empirical question.

In the context of Malaysia as an emerging economy, it has a relatively well-functioning capital markets that enable proper price discovery of financial assets, including debt instruments and firms could raise debt financing easily (Matemilola *et al.*, 2017). Concomitantly, the MCCG provides recommendations of the best CG practices for Malaysian firms. Among others, the selection of board members should consider their demographic attributes including age structure, and there should be clear separation between the chair and CEO. Given the robust developments in both the debt markets and CG in Malaysia, this raises pertinent questions as to whether chair-CEO age heterogeneity, in particular generational difference, can substitute other governance mechanisms, especially leverage.

Building on the substitutability theory in the agency context, this paper contends that leverage and chair-CEO generational difference may act as substitute governance mechanisms. This is supported by empirical evidence demonstrating that debt serves as a disciplinary mechanism to ensure that managers use the firms' resources more efficiently. Extant literature has also revealed that chair-CEO age heterogeneity, in particular generational difference, acts as an effective board monitoring mechanism to ensure that CEOs are more vigilant when developing corporate strategies. Nonetheless, prior studies have not explicitly explored the nexus between leverage and chair-CEO generational difference. This study hypothesizes that these governance mechanisms can substitute one another, especially in the Malaysian context as an emerging economy, given the greater reliance of Malaysian firms on debt financing due to its institutional setting as well as its robust CG development, particularly in promoting board diversity and chair-CEO role separation.

H1. There is a negative association between chair-CEO generational difference and debt.

3. Data and methodology

3.1 Sample and data

This paper covers the top 100 listed firms on Bursa Malaysia from 2013 to 2017, representing 56% of the stock exchange's cumulative market capitalization at the end of 2017. In 2012, a

revised version of the MCCG was introduced. The sample includes the debt financing choices of firms under this code until another revision was made in April 2017. The study period is confined to these five years to prevent the findings from being impacted by any changes in the MCCG [4]. However, this study excludes financial firms due to the unique nature of their financial ratios. All continuous data are winsorized at the 1st and 99th percentiles to alleviate influential outliers. Data pertaining to the CEO, BOD and CG measures are manually retrieved from annual reports and related websites. Accounting data and stock prices are extracted from Datastream. The final sample comprises a balanced panel of 500 firm-year observations.

3.2 Empirical model and estimation procedure

This paper adopts the following regression model, which is largely modeled after Zhou *et al.* (2019) and Goergen *et al.* (2015):

$$\begin{aligned} LEV_{it} = & \beta_0 + \beta_1 GENDIFF_{it} + \beta_2 Other\ chair - CEO\ differences_{it} + \beta_3 CEO\ characteristics_{it} \\ & + \beta_4 Chair\ characteristics_{it} + \beta_5 GOV_{it} + \beta_6 Firm\ characteristics_{it} \\ & + Sector\ dummies + \varepsilon_{it} \end{aligned} \quad (1)$$

where LEV_{it} denotes leverage, $GENDIFF_{it}$ is chair-CEO generational difference, $Other\ chair - CEO\ differences_{it}$ represents other chair-CEO differences besides age, the CEO and chair characteristics are represented by $CEO\ characteristics_{it}$ and $Chair\ characteristics_{it}$, respectively, GOV_{it} denotes board characteristics or CG measures, firm-specific characteristics are represented by $Firm\ characteristics_{it}$ and $Sector\ dummies$ is sector dummies. ε_{it} denotes the disturbance term.

The dependent variable is leverage (LEV), proxied by the market value of total debt ratio. In the robustness test section, this paper adopts another proxy for leverage, i.e. the market value of short-term debt ratio ($STLEV$).

Chair-CEO generational difference ($GENDIFF$) is the main independent variable. This dummy variable is equal to one if the chair-CEO age dissimilarity is considered a generational difference. Following Zhou *et al.* (2019) and Goergen *et al.* (2015), generational difference is defined as 20 or more years difference in age. According to them, monitoring intensity is the strongest when there are sufficiently large age gaps between the chair and CEO, such as across different generations. In the robustness test section, this research uses alternative proxies for chair-CEO age heterogeneity, i.e. chair-CEO age difference ($DIFFAGE$) and its square ($SQDIFFAGE$). Additionally, Goergen *et al.* (2015) have included two additional variables to measure the age characteristics of the CEO and chair, respectively, i.e. CEO age ($CEOAGE$) and chair age ($CHORAGE$). Accordingly, this study has also incorporated these variables to examine whether age itself is associated with leverage.

This paper has incorporated several categories of control variables. The first category controls for other chair-CEO differences besides age, i.e. educational background ($DIFFEDU$), gender ($DIFFGENDER$), nationality ($DIFFNATION$) and ethnicity ($DIFFETHNIC$). This category also includes a variable to account for chair-CEO similarities arising from their family relations, i.e. whether they originate from the same family ($SAMEFAMILY$). The second category controls for CEO's experience and power, i.e. CEO tenure ($CEOTENURE$) and CEO's status as founder of the firm ($CEOFOUNDER$). Meanwhile, the third category includes control variables to account for chair's characteristics, i.e. $CHRTENURE$ and $CHRFOUNDER$ (similar definitions as for CEO), busy chair ($BUSYCHR$) and chair is the firm's former CEO ($CHRFMRCEO$). This research also includes two dummy variables,

i.e. *CEOCHG* and *CHARCHG*, to account for any changes in the CEO and chair, respectively. Goergen *et al.* (2015) maintain that CEO or chair changes may affect chair-CEO age difference, which most probably will be correlated with the dependent variable. Hence, both variables are crucial to distinguish the influence of chair-CEO age difference and chair or CEO changes.

The fourth category controls for board characteristics which also serve as CG measures, i.e. average age of board members (*BDAGE*), busy board (*BUSYBD*), board age diversity (*BDAGEDIV*), board size (*BDSIZE*), board independence (*BDIND*), board gender diversity (*BDGENDIV*) and board meetings (*BDMEETING*) [5]. Additionally, this research also includes another CG measure, i.e. blockholders' ownership (*BHOWN*).

This paper includes firm characteristics in the fifth category of control variables, i.e. firm age (*FIRMAGE*), profitability (*PROFIT*), asset tangibility (*TANGI*), firm size (*FIRMSIZE*), growth opportunities (*GROWTH*), non-debt tax shield (*NDTS*) and liquidity (*LIQ*). This study uses sector dummies to control for unobservable sector effects. A summary of variable symbols and definitions is outlined in Table 1. Initially, this paper considers the static model to estimate the regression models. First, the Breusch-Pagan Lagrange multiplier (BPLM) test is conducted to identify whether random effect prevails in the data. A rejection of the null hypothesis would indicate the inappropriateness of using the pooled ordinary least squares (OLS) procedure. Second, for cases where we cannot pool the panel data, the Hausman test is performed to assess the explanatory power of the fixed and random effects models. A rejection of the null hypothesis would suggest that fixed effects model is preferred. Since the BPLM test statistic is statistically insignificant, the pooled OLS is the most suitable static model. To address potential endogeneity issue, the models are re-estimated using a dynamic model, i.e. the two-step system generalized method of moments (GMM) method. To ascertain the instrumental variables' robustness, two specification tests, i.e. the *J*-statistic and AR(2) test, are employed. The first is a test of overidentifying restrictions of the null hypothesis that there are valid instrumental variables. The second is a test of the null hypothesis that the model's residuals contain no second-order serial correlation.

4. Results and discussions

4.1 Descriptive statistics

Table 2 tabulates the descriptive statistics for the variables. On average, the leverage ratio is 17%, with a standard deviation of 16%. The minimum leverage ratio is 0%, while the maximum value is 87%. For 26% of the observations, the chair-CEO age difference is 20 years or more and for 97% of these cases, there is a relatively older chair than CEO. The average difference in age between both individuals is 12 years, where the mean age of the chair is 67 years and the CEO is 55 years. In terms of skewness, it is worth mentioning that *LEV*, *CEOAGE* and *GENDIFF* have positive skewness, which reaffirms that the sample firms have relatively low leverage, younger CEOs and the majority of chair-CEO age difference is less than 20 years. By contrast, *CHRAGE* has a negative skewness, which suggests that there are more older chairs in the sample firms. The kurtosis coefficients for *CEOAGE* and *GENDIFF* are below three, indicating that the data are normally distributed. Nevertheless, the kurtosis coefficients for *LEV* and *CHRAGE* are above three, which denote that these data have leptokurtic distributions and there are more extreme values with long fat-tail distributions.

For the sake of brevity, the Pearson's correlation coefficients between the variables are not provided and are available upon request from the author. *LEV* has a significant positive correlation with *CEOAGE*, *CHRAGE*, *SAMEFAMILY*, *CEOTENURE*, *BUSYCHR*, *CHRTENURE*, *CHRFOUNDER*, *BDAGE*, *BUSYBD*, *BDSIZE*, *BDMEETING* and *FIRMSIZE*. However, there is a significant negative correlation between *LEV* and *DIFFGENDER*, *DIFFNATION*, *DIFFETHNIC*, *CEOCHG*, *BDGENDERDIV*, *PROFIT*,

Symbol	Variable	Definition
<i>Dependent variable</i>		
<i>LEV</i>	Leverage (total debt ratio)	Ratio of book value of total debt to the sum of book value of total debt and market value of equity, where market value of equity is the product of total shares outstanding and share price of the firm
<i>STLEV</i>	Short-term debt ratio	Ratio of book value of short-term debt to the sum of book value of total debt and market value of equity
<i>Age characteristics</i>		
<i>CEOAGE</i>	CEO age	Natural logarithm of the CEO's age
<i>CHORAGE</i>	Chair age	Natural logarithm of the chair's age
<i>GENDIFF</i>	Chair-CEO generational difference	Dummy variable equals one if the chair-CEO age dissimilarity is at least 20 years and otherwise zero
<i>DIFFAGE</i>	Chair-CEO age difference	Difference between the chair and CEO's age
<i>SQDIFFAGE</i>	Squared chair-CEO age difference	Squared age difference between the chair and CEO
<i>Other chair-CEO differences</i>		
<i>DIFFEDU</i>	Chair-CEO educational background difference	Dummy variable equals one if there is a difference in the educational background between the chair and CEO and otherwise zero
<i>DIFFGENDER</i>	Chair-CEO gender difference	Dummy variable equals one if there is a difference in gender between the chair and CEO and otherwise zero
<i>DIFFNATION</i>	Chair-CEO nationality difference	Dummy variable equals one if there is a difference in nationality between the chair and CEO and otherwise zero
<i>DIFFETHNIC</i>	Chair-CEO ethnicity difference	Dummy variable equals one if there is a difference in ethnicity between the chair and CEO and otherwise zero
<i>SAMEFAMILY</i>	Chair-CEO same family	Dummy variable equals one if the chair and CEO are from the same family and otherwise zero
<i>CEO characteristics</i>		
<i>CEOTENURE</i>	CEO tenure	Number of years the CEO has been holding on to the position as the firm's CEO
<i>CEOFOUNDER</i>	Founder CEO	Dummy variable equals one if the CEO is the firm's founder and otherwise zero
<i>CEOCHG</i>	CEO change	Dummy variable equals one for years when there is a change in CEO and otherwise zero
<i>Chair characteristics</i>		
<i>BUSYCHR</i>	Busy chair	Dummy variable equals one if the chair holds at least three directorships and otherwise zero
<i>CHRTENURE</i>	Chair tenure	Number of years the chair has been holding on to the position as the chair of the board
<i>CHRFMRCEO</i>	Chair is former CEO of the firm	Dummy variable equals one if the chair is the former CEO of the firm and otherwise zero
<i>CHRFOUNDER</i>	Founder chair	Dummy variable equals one if the chair is the firm's founder and otherwise zero
<i>CHRCHG</i>	Chair change	Dummy variable equals one for years when there is a change in the chair and otherwise zero
<i>Board characteristics/CG measures</i>		
<i>BDAGE</i>	Age of board members	Average age of all board members
<i>BUSYBD</i>	Busy board	Dummy variable equals one if at least half of the board members hold three or more directorships and otherwise zero

Table 1.
Variable definitions

(continued)

Symbol	Variable	Definition
<i>BDAGEDIV</i>	Board age diversity	Coefficient of variation of board age which is measured as the ratio of the standard deviation of the age of board members to the mean age of all board members
<i>BDSIZE</i>	Board size	Total number of board members
<i>BDIND</i>	Board independence	Percentage of independent directors on the board
<i>BDGENDIV</i>	Board gender diversity	Percentage of female directors on the board
<i>BDMEETING</i>	Board meetings	Number of board meetings conducted during the financial year
<i>BHOWN</i>	Blockholders' ownership	Dummy variable equals one if the percentage of shares owned by any shareholders is at least half of a firm's equity and otherwise zero
<i>Firm characteristics</i>		
<i>FIRMAGE</i>	Firm age	Natural logarithm of the number of years since the firm was incorporated
<i>PROFIT</i>	Profitability	Ratio of operating profits to total assets
<i>TANGI</i>	Asset tangibility	Ratio of net property, plant and equipment to total assets
<i>FIRMSIZE</i>	Firm size	Natural logarithm of total assets
<i>GROWTH</i>	Growth opportunities	Ratio of the sum of book value of total debt and market value of equity to total assets
<i>NDTS</i>	Non-debt tax shield	Ratio of depreciation and amortization to total assets
<i>LIQ</i>	Liquidity	Ratio of current assets to current liabilities

Source(s): The author's own work

Table 1.

GROWTH, *NDTS* and *LIQ*. Interestingly, the correlation between *LEV* and *GENDIFF* is not statistically significant, which provides no preliminary support for *H1*. Notwithstanding these initial findings, further empirical analyses are conducted in the next section to confirm these associations. Overall, there is no issue with multicollinearity since the correlation coefficients between the independent variables are relatively low (below 0.8). The variance inflation factor values of below two further confirmed this matter.

4.2 Chair-CEO generational difference and firm leverage

Table 3 reports the main estimation results. For Models 1 through 3, the results are estimated using the pooled OLS procedure, where the standard errors are corrected for heteroscedasticity and clustered by years and firms. Meanwhile, Models 4 through 6 are estimated based on the system GMM technique, where the asymptotic standard errors are heteroscedasticity robust. The instrumental variables' validity is confirmed by the *J*-statistics, while the AR(2) test statistics indicate the absence of second-order correlation in the models' residuals. Since leverage displays persistence behavior as demonstrated by the coefficient of the lagged leverage which is significantly positive at the 1% level (Model 4 = 0.568, $p = 0.000$; Model 5 = 0.561, $p = 0.000$; Model 6 = 0.562, $p = 0.000$), suggesting that past leverage decisions influence current leverage, the GMM method serves as a better estimation procedure.

At first, this study estimates the effects of *CEOAGE*, *CHARGE* and other control variables on leverage, without incorporating chair-CEO generational difference. As shown in Model 1, the coefficient of CEO age is significantly positive at the 5% level (0.083, $p = 0.044$), which corresponds with *Chen et al. (2010)*. Meanwhile, the association between chair age and leverage is not statistically significant. Neither of these variables is statistically significant for Model 4. Next, this paper estimates the relationship between *GENDIFF* and leverage, without controlling for *CEOAGE* and *CHARGE*. The coefficient of chair-CEO generational difference

Variable	Mean	Std Dev	Min	Max	Skewness	Kurtosis	Obs
<i>Dependent variable</i>							
LEV	0.17	0.16	0.00	0.87	1.11	3.89	500
<i>Age characteristics</i>							
CEOAGE (years)	55.19	8.00	36.00	77.00	0.04	2.68	500
CHRAGE (years)	67.02	8.28	39.00	87.00	-0.14	3.30	500
GENDIFF	0.26	0.44	0.00	1.00	1.07	2.15	500
<i>Other chair-CEO differences</i>							
DIFFEDU	0.90	0.29	0.00	1.00	-2.74	8.52	500
DIFFGENDER	0.06	0.24	0.00	1.00	3.56	13.69	500
DIFFNATION	0.17	0.38	0.00	1.00	1.74	4.02	500
DIFFETHNIC	0.47	0.50	0.00	1.00	0.12	1.01	500
SAMEFAMILY	0.17	0.38	0.00	1.00	1.76	4.09	500
<i>CEO characteristics</i>							
CEOTENURE	9.86	9.90	1.00	46.00	1.49	4.72	500
CEOFOUNDER	0.11	0.31	0.00	1.00	2.49	7.21	500
CEOCHG	0.13	0.34	0.00	1.00	2.17	5.73	500
<i>Chair characteristics</i>							
BUSYCHR	0.67	0.47	0.00	1.00	-0.71	1.51	500
CHRTENURE	9.97	8.89	1.00	47.00	1.50	5.35	500
CHRFMRCEO	0.24	0.43	0.00	1.00	2.56	7.55	500
CHRFOUNDER	0.13	0.34	0.00	1.00	2.20	5.84	500
CHRCHG	0.10	0.30	0.00	1.00	2.63	7.92	500
<i>Board characteristics/CG measures</i>							
BDAGE	59.51	4.07	47.11	73.00	0.12	3.49	500
BUSYBD	0.47	0.50	0.00	1.00	0.10	1.01	500
BDAGEDIV	0.16	0.07	0.01	0.88	1.06	3.44	500
BDSIZE	8.78	1.83	5.00	14.00	0.27	2.73	500
BDIND	0.47	0.12	0.22	1.00	0.59	3.31	500
BDGENDIV	0.13	0.10	0.00	0.44	0.41	2.62	500
BDMEETING	6.31	3.01	2.00	25.00	2.51	11.19	500
BHOWN	0.43	0.50	0.00	1.00	0.28	1.08	500
<i>Firm characteristics</i>							
FIRMAGE (years)	47.57	37.07	1.00	217.00	-0.74	4.95	500
PROFIT	0.12	0.26	-0.41	4.96	13.57	236.11	500
TANGI	0.31	0.20	0.00	0.82	0.41	2.54	500
FIRMSIZE	22.07	1.46	18.13	25.68	0.01	2.71	500
GROWTH	2.00	2.01	0.51	14.80	3.40	16.37	500
NDTS	0.04	0.12	0.00	2.34	14.35	259.77	500
LIQ	2.43	2.13	0.00	14.61	2.70	11.84	500

Table 2.
Descriptive statistics

Note(s): Refer to Table 1 for symbol and definitions of variables

Source(s): The author's own work

is significantly negative at the 5% (Model 2 = $-0.028, p = 0.036$) and 10% (Model 5 = $-0.022, p = 0.072$) levels, which is in line with H1. Lastly, this research incorporates all variables, including CEOAGE, CHRAGE and GENDIFF, and finds that the coefficient of chair-CEO generational difference is negative but insignificant for Model 3. After controlling for endogeneity, it can be observed the coefficient of chair-CEO generational difference becomes significantly negative at the 10% level for Model 6 ($-0.031, p = 0.079$), which renders further support for H1. Nonetheless, both the coefficient of chair age and CEO age remain not significant for Models 3 and 6.

Variable	OLS			GMM		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Independent variables</i>						
CEOAGE	0.083** (2.01)		0.043 (0.85)	0.031 (0.68)		-0.015 (-0.28)
CHRAGE	-0.006 (-0.10)		0.022 (0.36)	0.027 (0.46)		0.071 (1.29)
GENDIFF		-0.028** (-2.10)	-0.022 (-1.32)		-0.022* (-1.80)	-0.031* (-1.76)
<i>Other chair-CEO differences</i>						
DIFFEDU	0.015 (0.74)	0.013 (0.59)	0.014 (0.66)	0.036 (0.74)	0.049 (1.02)	0.043 (0.97)
DIFFGENDER	0.024 (1.10)	0.028 (1.28)	0.027 (1.23)	0.016 (0.40)	0.011 (0.26)	0.004 (0.11)
DIFFNATION	-0.032* (-1.66)	-0.025 (-1.33)	-0.027 (-1.42)	0.051* (1.65)	0.055 (1.60)	0.053* (1.67)
DIFFETHNIC	-0.016 (-1.05)	-0.020 (-1.36)	-0.019 (-1.27)	-0.089** (-2.17)	-0.088** (-2.11)	-0.089** (-2.33)
SAMEFAMILY	0.026 (1.12)	0.028 (1.21)	0.029 (1.24)	0.018 (0.63)	0.021 (0.74)	0.024 (0.90)
<i>CEO characteristics</i>						
CEO Tenure	0.001 (0.77)	0.001 (1.11)	0.001 (0.92)	0.001 (1.25)	0.001 (1.22)	0.002 (1.39)
CEO Founder	-0.015 (-0.63)	-0.002 (-0.09)	-0.008 (-0.35)	-0.009 (-0.37)	0.001 (0.02)	-0.003 (-0.12)
CEO CHG	-0.009 (-0.57)	-0.012 (-0.73)	-0.010 (-0.62)	0.007 (0.91)	0.005 (0.54)	0.005 (0.59)
<i>Chair characteristics</i>						
Chair-CEO	0.014 (1.02)	0.019 (1.41)	0.017 (1.23)	0.014 (1.46)	0.014 (1.41)	0.015 (1.47)
Chair Tenure	0.002** (2.50)	0.002** (2.45)	0.002** (2.38)	-0.001 (-1.36)	-0.001 (-0.82)	-0.001 (-1.17)
Chair Founder	-0.063*** (-3.45)	-0.062*** (-3.37)	-0.062*** (-3.35)	-0.046** (-2.34)	-0.051*** (-2.62)	-0.046** (-2.49)
Chair CHG	0.041 (1.63)	0.044* (1.76)	0.042* (1.68)	0.010 (0.46)	0.016 (0.73)	0.009 (0.45)
Chair CG	0.035* (1.73)	0.032 (1.58)	0.034* (1.69)	-0.035 (-0.94)	-0.034 (-1.03)	-0.031 (-0.87)
<i>Board characteristics/CG measures</i>						
BDA GE	-0.004 (-1.44)	-0.003 (-1.12)	-0.003 (-1.40)	-0.001 (-0.21)	-0.001 (-0.16)	-0.001 (-0.26)
BDA YBD	0.028* (2.00)	0.027* (1.92)	0.028** (1.99)	-0.018 (-0.73)	-0.016 (-0.65)	-0.012 (-0.52)
BDA GEDIV	0.037 (0.46)	0.064 (0.79)	0.054 (0.68)	-0.002 (-0.02)	0.007 (0.07)	-0.003 (-0.03)
BDA SIZE	-0.003 (-0.86)	-0.003 (-0.90)	-0.004 (-0.93)	0.001 (0.21)	0.000 (0.02)	0.000 (0.06)
BDA ND	-0.080* (-1.82)	-0.097** (-2.12)	-0.090** (-1.97)	-0.077 (-1.44)	-0.086* (-1.65)	-0.087 (-1.57)
BDA GENDIV	-0.270*** (-4.18)	-0.278*** (-4.47)	-0.270*** (-4.19)	-0.108* (-1.82)	-0.111* (-1.88)	-0.096* (-1.79)
BDA MEETING	-0.003 (-1.58)	-0.003 (-1.60)	-0.003 (-1.63)	0.000 (0.04)	0.000 (0.02)	-0.000 (-0.12)

(continued)

Table 3.
Chair-CEO
generational difference
and firm leverage

Variable	OLS			GMM		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>BHOWN</i>	0.013 (0.97)	0.015 (1.10)	0.015 (1.10)	0.009 (0.61)	0.013 (0.90)	0.013 (0.91)
<i>Firm characteristics</i>						
<i>FIRMAGE</i>	0.012* (1.47)	0.013 (1.58)	0.012 (1.45)	-0.000 (-0.04)	-0.001 (-0.15)	-0.003 (-0.31)
<i>PROFIT</i>	0.001 (0.09)	0.005 (0.45)	0.003 (0.26)	0.011 (0.93)	0.007 (0.49)	0.007 (0.62)
<i>TANGL</i>	0.024 (0.61)	0.033 (0.83)	0.032 (0.79)	0.076* (1.95)	0.082** (2.00)	0.088** (2.11)
<i>FIRMSIZE</i>	0.038*** (7.44)	0.039*** (7.55)	0.039*** (7.49)	0.024*** (2.84)	0.027*** (3.10)	0.025*** (3.06)
<i>GROWTH</i>	-0.014*** (-3.95)	-0.015*** (-4.52)	-0.015*** (-4.15)	-0.004 (-1.58)	-0.005** (-1.96)	-0.005* (-1.81)
<i>NDTS</i>	-0.066 (-0.91)	-0.070 (-0.92)	-0.068 (-0.89)	-0.218** (-2.47)	-0.251*** (-2.85)	-0.236*** (-2.65)
<i>LIQ</i>	-0.019*** (-6.20)	-0.018*** (-5.80)	-0.018*** (-6.07)	-0.004 (-1.33)	-0.004 (-1.13)	-0.004 (-1.21)
Constant	-0.655* (-1.94)	-0.430** (-2.26)	-0.631* (-1.86)	-0.594* (-1.80)	-0.435** (-2.00)	-0.600* (-1.88)
<i>Lagged LEV</i>				0.568*** (5.16)	0.561*** (5.21)	0.562*** (5.10)
Sector effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	500	500	500	400	400	400
Adjusted R-squared	0.487	0.489	0.488	0.814	0.700	0.661
AR(2): <i>p</i> value				0.918	0.923	0.928
<i>J</i> -statistic: <i>p</i> value						

Note(s): Dependent variable is *LEV*. Figures in parentheses are *t*-statistics. Refer to Table 1 for symbol and definitions of variables. ***, **, * Statistical significance at the 1, 5 and 10% level, respectively

Source(s): The author's own work

As a whole, the results demonstrate that there is an inverse relationship between chair-CEO generational difference and leverage. This lends credence to the upper echelons theory which posits that TMT's background characteristics, including age, have a profound influence on corporate decisions (Hambrick and Mason, 1984). Furthermore, the findings support the homophily theory which conjectures that individuals who share certain similarities prefer to communicate among themselves (McPherson *et al.*, 2001). Extending this argument, heterogeneity stimulates healthy disagreement and cognitive conflicts (Choi and Sy, 2010) and heterogeneous groups are more effective in problem solving due to diverse perspectives and opinions (Talavera *et al.*, 2018).

The results are in line with Goergen *et al.* (2015) who demonstrate that substantial chair-CEO age differences precipitate cognitive conflicts, which lead to improved control and monitoring. These cognitive conflicts could be attributed to differences in values, beliefs, experience and attitudes between the older chair and younger CEO or vice versa. Accordingly, greater emphasis is placed on ensuring that firms practice proper corporate disclosure and governance, which reduces information asymmetry and agency conflicts.

The findings further imply that since chair-CEO generational difference serves as an effective board monitoring mechanism, it substitutes leverage to overcome agency cost of equity, which lend support to the substitutability theory between chair-CEO generational difference and debt introduced in this paper. The results are consistent with Jiraporn *et al.* (2012) who find that firms adopt higher leverage when their managers are more entrenched with weak CG. This is in accord with Chung and Wang (2014) who report that firms rely less on leverage when the monitoring function of debt is replaced by institutional investors. The findings also complement past studies (Paligorova and Xu, 2012; Faccio *et al.*, 2010) which reveal that leverage can be abused as a mechanism for minority shareholders' wealth expropriation, especially in countries with poor corporate legal enforcement and institutions and where firms have higher ownership concentration (e.g. pyramidal groups) such as in the case of emerging economies. Hence, other board monitoring mechanisms such as chair-CEO age heterogeneity could assume a substitute role in place of leverage to mitigate agency conflicts.

The implication from these findings is chair-CEO generational difference can act as an alternative board monitoring mechanism in place of leverage. Hence, policymakers and managers of firms should continue to promote diversity in the BOD and TMT, particularly in relation to the chair-CEO relative age. Additionally, investors should consider the alternative CG practices adopted by firms, especially debt financing or having chair and CEO with substantial age dissimilarity, when formulating investment decisions.

5. Robustness tests

In this section, additional tests are performed using alternative proxies for leverage and chair-CEO generational difference to determine the robustness of the results.

5.1 Alternative proxy for leverage

This paper re-runs the regressions using another proxy for leverage, i.e. the market value of short-term debt ratio (*STLEV*), and the findings are tabulated in Table 4. Similar to Table 3, the results are estimated using the pooled OLS (Models 1 through 3) and system GMM (Models 4 through 6) procedures. Although the coefficient of chair-CEO generational difference remains significantly negative at the 5% level for Model 2 ($-0.022, p = 0.011$), this variable is not significant when estimated using system GMM. Since the GMM method serves as a better estimation procedure, this study concludes that the robustness test using *STLEV* as the proxy for leverage does not support H1. Meanwhile, the findings for the remaining control variables are largely qualitatively similar with those presented in Table 3.

Table 4.
Robustness:
alternative proxy for
firm leverage

Variable	OLS			GMM		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Independent variables						
<i>CEOAGE</i>	0.066** (2.43)		0.044 (1.37)	0.035 (1.01)		0.034 (0.65)
<i>CHORAGE</i>	-0.042 (-1.21)		-0.027 (-0.65)	0.068 (1.27)		0.069 (1.15)
<i>GENDIFF</i>		-0.022** (-2.57)	-0.012 (-1.03)		0.002 (0.23)	0.001 (0.06)
Other chair-CEO differences	Yes	Yes	Yes	Yes	Yes	Yes
CEO characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Chair characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Board characteristics/CG measures	Yes	Yes	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Constant						
<i>Lagged LEV</i>						
Sector effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	500	500	500	400	400	400
Adjusted <i>R</i> -squared	0.364	0.364	0.364	0.822	0.775	0.866
AR(2); <i>p</i> value				0.580	0.714	0.585
<i>J</i> -statistic; <i>p</i> value						

Note(s): Dependent variable is *STLEV*. Figures in parentheses are *t*-statistics. Refer to Table 1 for symbol and definitions of variables. ***, **, * Statistical significance at the 1, 5 and 10% level, respectively

Source(s): The author's own work

5.2 Alternative proxy for chair-CEO generational difference

This study adopts an alternative proxy for chair-CEO age heterogeneity, i.e. chair-CEO age difference (*DIFFAGE*) and its square (*SQDIFFAGE*) (Zhou *et al.*, 2019; Goergen *et al.*, 2015). According to Goergen *et al.* (2015), cognitive conflicts and communication breakdowns between the chair and CEO can happen either if the chair is much older than the CEO or vice versa. Moreover, if the association between age difference and the dependent variable is non-linear and the direction of this association does not matter, only the squared version of this functional form (*SQDIFFAGE*) is expected to be significant. Table 5 demonstrates the results using the pooled OLS (Model 1) and system GMM (Model 2) techniques. As anticipated, only the coefficient of *SQDIFFAGE* is significantly negative at the 5% (Model 1 = -0.000 , $p = 0.024$) and 10% (Model 2 = -0.000 , $p = 0.091$) levels, while the coefficient of *DIFFAGE* is insignificant. The results render further support to H1 and the robustness of the central findings that only substantial chair-CEO age gaps are negatively related to leverage.

6. Conclusion and implications of study

6.1 Conclusion

This paper explores the substitutability of chair-CEO generational difference and debt financing. Although extant literature has documented the role of debt and chair-CEO generational difference as governance mechanisms to overcome agency cost of equity, they are investigated separately. Consequently, very little is known about whether they act as substitute governance mechanisms. Thus, it is the primary aim of this study to fill this research gap by analyzing their substitutability as alternative governance mechanisms based on the evidence of the listed firms in Malaysia from 2013 to 2017 using both the pooled OLS and system GMM estimators.

The findings reveal that chair-CEO generational difference has an inverse association with leverage, which is consistent with this study's hypothesis. The results demonstrate that substantial differences in age between both individuals precipitate cognitive conflicts, which lead to improved control and monitoring. This alleviates the agency cost of equity due to

Variable	OLS Model 1	GMM Model 2
<i>Independent variables</i>		
<i>DIFFAGE</i>	0.000 (0.62)	0.001 (1.01)
<i>SQDIFFAGE</i>	-0.000^{**} (-2.26)	-0.000^* (-1.69)
Other chair-CEO differences	Yes	Yes
CEO characteristics	Yes	Yes
Chair characteristics	Yes	Yes
Board characteristics/CG measures	Yes	Yes
Firm characteristics	Yes	Yes
Constant	Yes	Yes
<i>Lagged LEV</i>		Yes
Sector effects	Yes	Yes
Observations	500	400
Adjusted <i>R</i> -squared	0.488	
AR(2): <i>p</i> value		0.718
<i>J</i> -statistic: <i>p</i> value		0.918

Note(s): Dependent variable is *LEV*. Figures in parentheses are *t*-statistics. Refer to Table 1 for symbol and definitions of variables. ***, **, * Statistical significance at the 1, 5 and 10% level, respectively

Source(s): The author's own work

Table 5.
Robustness:
alternative proxy for
chair-CEO
generational difference

better corporate disclosure and lower information asymmetry. This further implies that since chair-CEO generational difference serves as an effective board monitoring mechanism, it substitutes debt to overcome agency problems. Additional tests using alternative proxies for chair-CEO age heterogeneity reveal consistent findings, which reaffirms the results' robustness. The results lend credence to the substitutability theory postulated in this paper and are consistent with prior studies such as [Goergen *et al.* \(2015\)](#), [Chung and Wang \(2014\)](#) and [Jiraporn *et al.* \(2012\)](#).

6.2 Theoretical implications

This paper enriches the CG and capital structure literature by furnishing initial evidence on how chair-CEO generational difference is related to debt financing. There is a dearth of literature examining chair-CEO age heterogeneity and these studies did not explore its association with debt financing. The results of this study shed light on how chair-CEO age heterogeneity, especially generational difference, may serve as a source of board effectiveness and substitute debt as an alternative governance mechanism.

Additionally, the findings lend credence to the substitutability theory between chair-CEO generational difference and debt introduced in this paper. Although prior studies have acknowledged the roles of debt financing ([Jensen, 1986](#); [Jensen and Meckling, 1976](#)) and chair-CEO generational difference ([Zhou *et al.*, 2019](#); [Goergen *et al.*, 2015](#)) as governance mechanisms, thus far extant literature has not explored their substitutability to alleviate agency cost of equity. The substitutability theory is developed based on agency theory which posits that debt may serve as a governance mechanism to discipline managers to utilize the firms' resources more efficiently. Besides, this theory is built upon the upper echelons and homophily theories, which postulate that chair-CEO age heterogeneity, in particular generational difference, may serve as an effective board monitoring mechanism to ensure that CEOs are more vigilant when developing corporate strategies. This further suggests that these governance mechanisms can substitute each other.

Besides, this study broadens the emerging research on the influence of chair-CEO heterogeneity, which is largely concentrated on advanced economies ([Zhou *et al.*, 2019](#); [Goergen *et al.*, 2015](#)). Despite differences in institutional backgrounds and level of economic development, the consistency of findings in the present research, which is performed on an emerging market, with past studies conducted on advanced economies reaffirms the profound impact of chair-CEO demographic dissimilarities across different economies and countries.

6.3 Practical implications

The findings may benefit policymakers and managers of firms by shedding light on the interactions between governance mechanisms, in particular debt financing and chair-CEO generational difference, to alleviate agency cost of equity. Besides, the results may provide valuable insights on the importance of the on-going effort to promote diversity in the BOD and TMT, especially in relation with the chair-CEO relative age, where substantial dissimilarities in age between these individuals can serve as an effective monitoring mechanism to substitute debt in mitigating agency conflicts. Policymakers should consider strengthening age-related policies, which are presently not being accounted for in Malaysia and many other countries.

Lastly, the results may assist investors in their investment decisions, by considering alternative CG practices adopted by firms. Concomitantly, firms with better CG quality such as those adopting more debt financing or having chair and CEO with substantial age dissimilarity, should have better corporate disclosure and less information asymmetry. This will further facilitate investors in making more informed investment decisions.

6.4 Limitations of study and recommendations for future research

This paper has several limitations. First, this is a single-country research. Future studies could cover a larger sample of countries to improve generalizability. Second, this study assumes that the firms' overall leverage as being homogenous. However, different types of debt may have varying ability to monitor managers' behavior (Choi *et al.*, 2016). Future research may consider how different types of creditors (e.g. bank creditors versus bondholders) may affect monitoring effectiveness.

Notes

1. Some researchers argue that debt may not necessarily act as a governance mechanism in certain circumstances. For instance, when firms borrow from multiple bank creditors, free-riding problem and agency conflicts may prevail because a bank creditor may assume that another bank creditor is monitoring the borrower (Ariyono and Setiyono, 2020). Besides, debt effectiveness as a governance mechanism also depends on whether it is borrowed privately from banks or is issued in the public market (e.g. bonds), where the former is more effective than the latter (Bharath and Hertzal, 2019).
2. It is notable that although there is no strict requirement for the demarcation of both roles, all the sample firms in this study abide by the MCCG's recommendations. This paper answers recent call by Goergen *et al.* (2015) to not only analyze the role of chair-CEO age dissimilarity among firms functioning based on the two-tier board system, but to extend the investigation to firms under the single-tier governance system.
3. This paper treats the debt financing, leverage and capital structure terminologies synonymously.
4. Among the major changes in the revised MCCG in 2017 which were not found in the earlier version in 2012 were related to board gender diversity and independence. MCCG 2012 merely states that the BOD should ensure that there is board gender diversity, while MCCG 2017 explicitly requires that the board of large firms (i.e. top 100 listed firms with market capitalization of at least RM2 billion) must comprise at least 30% female directors. MCCG 2017 also encouraged gender diversity to be extended to the TMT. Additionally, MCCG 2012 highlights that an independent director's tenure should not exceed nine years, while MCCG 2017 discourages the tenure of an independent director of large firms to exceed 12 years.
5. Besides the chair and board members, board meetings are usually attended by the CEO and other TMT as well to provide additional insights, explanation and advice on any specific corporate matters.

References

- Adusei, M. and Obeng, E.Y.T. (2019), "Board gender diversity and the capital structure of microfinance institutions: a global analysis", *Quarterly Review of Economics and Finance*, Vol. 71, pp. 258-269, doi: [10.1016/j.qref.2018.09.006](https://doi.org/10.1016/j.qref.2018.09.006).
- Ariyono, B.D. and Setiyono, B. (2020), "Does institutional ownership and bank monitoring affect agency conflicts? Evidence from an emerging market", *Journal of Indonesian Economy and Business*, Vol. 35 No. 3, pp. 171-187, doi: [10.22146/jieb.53110](https://doi.org/10.22146/jieb.53110).
- Arping, S. and Sautner, Z. (2010), "Corporate governance and leverage: evidence from a natural experiment", *Finance Research Letters*, Vol. 7 No. 2, pp. 127-134, doi: [10.1016/j.frl.2010.02.003](https://doi.org/10.1016/j.frl.2010.02.003).
- Azzam, A. and Alhababsah, S. (2023), "Does age similarity between board chair and CEO matter for R&D investments? Evidence from China", *Finance Research Letters*, Vol. 58, 104522, doi: [10.1016/j.frl.2023.104522](https://doi.org/10.1016/j.frl.2023.104522).
- Berke-Berga, A. and Dovladbekova, I. (2019), "Capital structure and corporate governance: evidence from Eastern European listed companies", *Polish Journal of Management Studies*, Vol. 20 No. 2, pp. 161-173, doi: [10.17512/pjms.2019.20.2.14](https://doi.org/10.17512/pjms.2019.20.2.14).
- Bharath, S.T. and Hertzal, M. (2019), "External governance and debt structure", *The Review of Financial Studies*, Vol. 32 No. 9, pp. 3335-3365, doi: [10.1093/rfs/hhy112](https://doi.org/10.1093/rfs/hhy112).

- Chaudhary, P. (2022), "Agency costs, board structure and institutional investors: case of India", *Asian Journal of Accounting Research*, Vol. 7 No. 1, pp. 44-58, doi: [10.1108/ajar-12-2020-0130](https://doi.org/10.1108/ajar-12-2020-0130).
- Chen, H.L., Hsu, W.T. and Huang, Y.S. (2010), "Top management team characteristics, R&D investment and capital structure in the IT industry", *Small Business Economics*, Vol. 35 No. 3, pp. 319-333, doi: [10.1007/s11187-008-9166-2](https://doi.org/10.1007/s11187-008-9166-2).
- Choi, J.N. and Sy, T. (2010), "Group-level organizational citizenship behavior: effects of demographic faultlines and conflict in small work groups", *Journal of Organizational Behavior*, Vol. 31 No. 7, pp. 1032-1054, doi: [10.1002/job.661](https://doi.org/10.1002/job.661).
- Choi, B., Kumar, M.V.S. and Zambuto, F. (2016), "Capital structure and innovation trajectory: the role of debt in balancing exploration and exploitation", *Organization Science*, Vol. 27 No. 5, pp. 1183-1201, doi: [10.1287/orsc.2016.1089](https://doi.org/10.1287/orsc.2016.1089).
- Chow, Y.P. (2023), "Chair-CEO demographic dissimilarities and firm internationalization", *Review of International Business and Strategy*, Vol. 33 No. 2, pp. 246-271, doi: [10.1108/ribs-09-2021-0120](https://doi.org/10.1108/ribs-09-2021-0120).
- Chow, Y.P., Muhammad, J., Bany-Arifin, A.N. and Cheng, F.F. (2018), "Macroeconomic uncertainty, corporate governance and corporate capital structure", *International Journal of Managerial Finance*, Vol. 14 No. 3, pp. 301-321, doi: [10.1108/ijmf-08-2017-0156](https://doi.org/10.1108/ijmf-08-2017-0156).
- Chung, C.Y. and Wang, K. (2014), "Do institutional investors monitor management? Evidence from the relationship between institutional ownership and capital structure", *North American Journal of Economics and Finance*, Vol. 30, pp. 203-233, doi: [10.1016/j.najef.2014.10.001](https://doi.org/10.1016/j.najef.2014.10.001).
- Comino-Jurado, M., Sánchez-Andújar, S. and Parrado-Martínez, P. (2021), "Reassessing debt-financing decisions in family firms: family involvement on the board of directors and generational stage", *Journal of Business Research*, Vol. 135, pp. 426-435, doi: [10.1016/j.jbusres.2021.06.060](https://doi.org/10.1016/j.jbusres.2021.06.060).
- Faccio, M., Lang, L.H.P. and Young, L. (2010), "Pyramiding vs leverage in corporate groups: international evidence", *Journal of International Business Studies*, Vol. 41 No. 1, pp. 88-104, doi: [10.1057/jibs.2009.33](https://doi.org/10.1057/jibs.2009.33).
- Farhangdoust, S., Salehi, M. and Molavi, H. (2020), "Management stock ownership and corporate debt: evidence from an emerging market", *Management Research Review*, Vol. 43 No. 10, pp. 1241-1271, doi: [10.1108/mrr-12-2018-0475](https://doi.org/10.1108/mrr-12-2018-0475).
- Faysal, S., Salehi, M. and Moradi, M. (2020), "The impact of ownership structure on the cost of equity in emerging markets", *Management Research Review*, Vol. 43 No. 10, pp. 1221-1239, doi: [10.1108/mrr-11-2019-0475](https://doi.org/10.1108/mrr-11-2019-0475).
- Faysal, S., Salehi, M. and Moradi, M. (2021), "Impact of corporate governance mechanisms on the cost of equity capital in emerging markets", *Journal of Public Affairs*, Vol. 21 No. 2, pp. 1-11, doi: [10.1002/pa.2166](https://doi.org/10.1002/pa.2166).
- Fracassi, C. and Tate, G. (2012), "External networking and internal firm governance", *Journal of Finance*, Vol. 67 No. 1, pp. 153-194, doi: [10.1111/j.1540-6261.2011.01706.x](https://doi.org/10.1111/j.1540-6261.2011.01706.x).
- Ghorbani, A. and Salehi, M. (2021), "Earnings management and the informational and disciplining role of debt: evidence from Iran", *Journal of Asia Business Studies*, Vol. 15 No. 1, pp. 72-87, doi: [10.1108/jabs-11-2019-0336](https://doi.org/10.1108/jabs-11-2019-0336).
- Goergen, M., Limbach, P. and Scholz, M. (2015), "Mind the gap: the age dissimilarity between the chair and the CEO", *Journal of Corporate Finance*, Vol. 35, pp. 136-158, doi: [10.1016/j.jcorpfin.2015.08.011](https://doi.org/10.1016/j.jcorpfin.2015.08.011).
- Hambrick, D.C. and Mason, P.A. (1984), "Upper echelons: the organization as a reflection of its top managers", *Academy of Management Review*, Vol. 9 No. 2, pp. 193-206, doi: [10.2307/258434](https://doi.org/10.2307/258434).
- Jensen, M.C. (1986), "Agency costs of free cash flow, corporate finance, and takeovers", *American Economic Review*, Vol. 76 No. 2, pp. 323-329.
- Jensen, M.C. and Meckling, W.H. (1976), "Theory of the firm: managerial behavior, agency costs and ownership structure", *Journal of Financial Economics*, Vol. 3 No. 4, pp. 305-360, doi: [10.1016/0304-405x\(76\)90026-x](https://doi.org/10.1016/0304-405x(76)90026-x).

- Jiraporn, P., Kim, J.C., Kim, Y.S. and Kitsabunnarat, P. (2012), "Capital structure and corporate governance quality: evidence from the Institutional Shareholder Services (ISS)", *International Review of Economics and Finance*, Vol. 22 No. 1, pp. 208-221, doi: [10.1016/j.iref.2011.10.014](https://doi.org/10.1016/j.iref.2011.10.014).
- Matemilola, B.T., Bany-Ariffin, A.N., Nassir, A.M. and Azman-Saini, W.N.W. (2017), "Moderating effects of firm age on the relationship between debt and stock returns", *Journal of Asia-Pacific Business*, Vol. 18 No. 1, pp. 81-96, doi: [10.1080/10599231.2017.1272999](https://doi.org/10.1080/10599231.2017.1272999).
- McPherson, M., Smith-Lovin, L. and Cook, J.M. (2001), "Birds of a feather: homophily in social networks", *Annual Review of Sociology*, Vol. 27 No. 1, pp. 415-444, doi: [10.1146/annurev.soc.27.1.415](https://doi.org/10.1146/annurev.soc.27.1.415).
- Nini, G., Smith, D.C. and Sufi, A. (2012), "Creditor control rights, corporate governance, and firm value", *The Review of Financial Studies*, Vol. 25 No. 6, pp. 1713-1761, doi: [10.1093/rfs/hhs007](https://doi.org/10.1093/rfs/hhs007).
- Nisiyama, E.K. and Nakamura, W.T. (2018), "Diversity of the board and capital structure", *Journal of Business Management*, Vol. 58 No. 6, pp. 551-563, doi: [10.1590/s0034-759020180604](https://doi.org/10.1590/s0034-759020180604).
- Oware, K.M., Appiah, K. and Worae, T.A. (2023), "CSR disclosure and debt financing in India: does CEO tenure matter?", *Journal of Applied Accounting Research*, Vol. 24 No. 3, pp. 442-463, doi: [10.1108/jaar-08-2021-0204](https://doi.org/10.1108/jaar-08-2021-0204).
- Paligorova, T. and Xu, Z. (2012), "Complex ownership and capital structure", *Journal of Corporate Finance*, Vol. 18 No. 4, pp. 701-716, doi: [10.1016/j.jcorpfin.2012.05.001](https://doi.org/10.1016/j.jcorpfin.2012.05.001).
- Salehi, M. and Salami, S. (2020), "Corporate tax aggression and debt in Iran", *Journal of Islamic Accounting and Business Research*, Vol. 11 No. 1, pp. 257-271, doi: [10.1108/jiab-10-2016-0127](https://doi.org/10.1108/jiab-10-2016-0127).
- Salehi, M., Lotfi, A. and Farhangdoust, S. (2017), "The effect of financial distress costs on ownership structure and debt policy: an application of simultaneous equations in Iran", *Journal of Management Development*, Vol. 36 No. 10, pp. 1216-1229, doi: [10.1108/jmd-01-2017-0029](https://doi.org/10.1108/jmd-01-2017-0029).
- Salehi, M., Bayaz, M.L.D. and Naemi, M. (2018a), "The effect of CEO tenure and specialization on timely audit reports of Iranian listed companies", *Management Decision*, Vol. 56 No. 2, pp. 311-328, doi: [10.1108/md-10-2017-1018](https://doi.org/10.1108/md-10-2017-1018).
- Salehi, M., Tarighi, H. and Safdari, S. (2018b), "The relation between corporate governance mechanisms, executive compensation and audit fees: evidence from Iran", *Management Research Review*, Vol. 41 No. 8, pp. 939-967, doi: [10.1108/mrr-12-2016-0277](https://doi.org/10.1108/mrr-12-2016-0277).
- Salehi, M., Bayaz, M.L.D. and Moghadam, S.M. (2018c), "The relationship between management characteristics and firm innovation", *International Journal of Productivity and Performance Management*, Vol. 67 No. 7, pp. 1113-1131, doi: [10.1108/ijppm-05-2017-0126](https://doi.org/10.1108/ijppm-05-2017-0126).
- Salehi, M., Moradi, M. and Faysal, S. (2023), "The relationship between corporate governance and cost of equity: evidence from the ISIS era in Iraq", *International Journal of Emerging Markets*. doi: [10.1108/ijoem-07-2020-0739](https://doi.org/10.1108/ijoem-07-2020-0739).
- Talavera, O., Yin, S. and Zhang, M. (2018), "Age diversity, directors' personal values, and bank performance", *International Review of Financial Analysis*, Vol. 55, pp. 60-79, doi: [10.1016/j.irfa.2017.10.007](https://doi.org/10.1016/j.irfa.2017.10.007).
- Tekin, H. and Polat, A.Y. (2023), "Is leverage a substitute or outcome for governance? Evidence from financial crises", *International Journal of Emerging Markets*, Vol. 18 No. 4, pp. 1007-1030, doi: [10.1108/ijoem-03-2020-0297](https://doi.org/10.1108/ijoem-03-2020-0297).
- Wang, B.Y., Duan, M. and Liu, G. (2021), "Does the power gap between a chairman and CEO matter? Evidence from corporate debt financing in China", *Pacific-Basin Finance Journal*, Vol. 65, 101495, doi: [10.1016/j.pacfin.2021.101495](https://doi.org/10.1016/j.pacfin.2021.101495).
- Ward, A.J., Brown, J.A. and Rodriguez, D. (2009), "Governance bundles, firm performance, and the substitutability and complementarity of governance mechanisms", *Corporate Governance: An International Review*, Vol. 17 No. 5, pp. 646-660, doi: [10.1111/j.1467-8683.2009.00766.x](https://doi.org/10.1111/j.1467-8683.2009.00766.x).
- Zhou, Y., Kara, A. and Molyneux, P. (2019), "Chair-CEO generation gap and bank risk-taking", *British Accounting Review*, Vol. 51 No. 4, pp. 352-372, doi: [10.1016/j.bar.2019.03.005](https://doi.org/10.1016/j.bar.2019.03.005).

Zhou, M., Li, K. and Chen, Z. (2021), "Corporate governance quality and financial leverage: evidence from China", *International Review of Financial Analysis*, Vol. 73, 101652, doi: [10.1016/j.irfa.2020.101652](https://doi.org/10.1016/j.irfa.2020.101652).

Zhu, J., Gao, J. and Tan, H. (2023), "Mind the chair-CEO age dissimilarity: an implicit internal monitoring mechanism", *Applied Economics Letters*, Vol. 30 No. 15, pp. 2014-2019, doi: [10.1080/13504851.2022.2089340](https://doi.org/10.1080/13504851.2022.2089340).

Corresponding author

Yee Peng Chow can be contacted at: chowyeepeng@gmail.com