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CRITICAL FACTORS INFLUENCING FIRMS' RISK-TAKING BEHAVIOUR: CEO CHARACTERISTICS AND THE MODERATING ROLE OF THE AUDIT COMMITTEE

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Abstract

This paper aims to explore the effects of chief executive officer (CEO) characteristics on managerial risk-taking behaviour and the moderating impact of audit committee (AC) ownership and ethnicity in this relationship. The underlining theory employed in this study is the upper echelons theory (UET). Data were hand-collected from annual reports of the top 100 Malaysian PLCs over 2015-2020 and were analysed through multiple regression analysis and Hayes' process moderation analysis. The findings suggest that CEO age negatively affects risk-taking. The results, however, do not support the use of CEO tenure and gender as proxies for managerial risk-taking behaviour. AC ownership has a significant positive moderating effect on the relationship between CEO age, tenure, gender and risk-taking. Contrarily, AC ethnicity only significantly moderates the association between CEO gender and risk-taking. This study further adds to the existing literature considering these independent variables.

Implications for Central European audience: This study serves as a good yardstick for exploring the effects of CEOs' characteristics. While this study is within the Malaysian context, it is undoubtedly useful in the Central European context. Risk-taking behaviour can be dispersed over all sectors, especially as this study employs the UET theory. The findings would set a comparison for corporations in Central European countries.

Keywords: CEO; audit committee ownership; risk-taking; ethnicity
JEL Classification: G32, M49, G39

Introduction

Corporate risk-taking has been a central component of strategic management research (Hoskisson et al., 2016). Since the rapid pace of technology, social and economic progress

elevated the uncertainty level of the business environment (Alshirah et al., 2020), managing risks has become more difficult. Risk-taking indicates the willingness to adopt strategic decisions that produce uncertain and significant firm outcomes (Gilley et al., 2002). To rephrase it, it involves uncontrollability (Vlek & Stallen, 1980), a lack of knowledge (March & Shapira, 1987) and variability of potential outcomes (Libby & Fishburn, 1977), where the costs of failure may be huge (Jalali et al., 2014).

Xu (2015) and Lu et al. (2015) described that risk-taking enables firms to access new customers, leading to better performance. If the managers commit funds to low-risk but unprofitable projects which reduce the firm value, this will concern shareholders, and they may be reluctant to invest in the firm (Elvin & Abdul Hamid, 2016), which eventually may trigger a stock price crash and business failure. Conversely, excessive risk-taking can be detrimental to firms. Firms that engage in riskier projects have greater but highly volatile returns (Alam & Shah, 2013). Consider the corporate failures such as Enron and Lehman Brothers together with the reoccurrence of financial crises. These events show that inappropriate risk-taking threatens firm survivability and even creates a global recession. Belanes and Hachana (2009) concluded a non-linear relationship between managerial risk-taking and performance among Tunisian public-listed companies (PLCs). They found that as managerial risk-taking increases, the return on assets increases up to a maximum point and declines beyond that level. Kreiser et al. (2012) outlined that risk-taking has a negative U-shaped relationship with performance, showing that no risk or a higher level of risk may bring costly failure. Hence, moderate risk-taking is more appropriate for firms to remain competitive.

The main theme of this research is to investigate the effect of chief executive officer (CEO) characteristics on risk-taking. The CEO is the highest-ranked officer who is at the apex of power to set strategic directions. Upper echelons theory (UET) provides demographic traits which can be used to explain CEOs' strategic choices (Hambrick & Mason, 1984). Among various observable elements, age, tenure and gender were acknowledged as the most accessible demographic factors. A mainstream view is that risk-averseness is related to a CEO who is older (Kaur & Singh, 2020), longer-tenured (Loukil & Yousfi, 2022) and female (Elsaid & Ursel, 2011). This study aims to extend the prior literature within the Malaysian context.

Given the board of directors (BOD) responsibilities for representing the shareholders' interests, the audit committee (AC) plays a significant role to mitigate agency problems by restricting management's opportunistic behaviour (Marzuki, 2022). The AC is responsible for overseeing the financial reporting process and monitoring internal control mechanisms and risk management practices (Dzomira, 2020). A competent AC should organize an in-depth review of the business risk appetite and make recommendations to the BOD to ensure that risk management processes are effective and consistent with organizational objectives (Al-Shaer et al., 2021). To enhance corporate governance's effectiveness, AC independence is the most significant factor (Edogbanya & Karmardin, 2015; Tušek, 2015). Particularly, ownership influences the alignment of ACs' interests, which in turn affects their independence in governing managerial risk-taking behaviour.

Malaysia is a multi-ethnic society that largely comprises Malays, followed by Chinese and Indians. In 1971, Malaysia adopted the New Economic Policy (NEP), which offers preferential business treatment to Malays and mandates that one-third of the BOD must be composed of Malays. This discrimination based on ethnicity gave rise to a divergence in cultural values,

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which subsequently influences corporate behaviour (Wan Mohammad et al., 2016). Hence, it is worth assessing how AC attributes such as ownership and ethnicity moderate the association between CEO characteristics and risk-taking in Malaysia.

1 Problem Statement

Ideally, managers will choose appropriate risky strategies that maximize shareholders' value. However, according to agency theory, the separation of ownership and control in PLCs causes a discrepancy in risk attitudes between shareholders and managers (Ramli, 2019). As a rational self-interest maximizer, the manager is risk-averse due to the incapacity to diversify their risks with respect to employment, ownership stakes and human capital (Wang & Barney, 2006). Contrarily, shareholders desire risky investments to improve future earnings because they can diversify their risks easily through portfolio diversification (Anjum et al., 2020). Therefore, managers may minimize risky strategies for their personal interests, which is in opposition to shareholders' best interests (Mustapha & Che Ahmad, 2011). For instance, Esprit, which was unable to take enough risks to embrace new opportunities during COVID-19, closed all its shops in Asia in June 2020. There are also concerns about excessive risk-taking. For example, the proposition of a risky merger between EcoWorld and UEM Sunrise in October 2020 was dissipated after a mere three months due to the challenging environment during COVID-19. Hence, the general problem is that stakeholders may lack an understanding of how risk-taking is affected, which is important for survival and growth.

This study also aims to address a few gaps. Firstly, the majority of the existing risk-taking literature has focused on firms on developed markets such as the USA (Ho et al., 2013) and Italy (Romano et al., 2017), and large emerging markets such as China (Lu et al., 2015), that are conducive to managerial risk-taking, with much fewer considerations given to small emerging markets such as Malaysia. Malaysia has a much more recent corporate governance mechanism, a less developed capital market and more concentrated ownership. The evidence found on developed markets may not be readily extended to expanding markets. Accordingly, this study bridges these gaps and explores risk-taking in Malaysia.

Secondly, ACs' credibility in risk management is increasingly being challenged in many countries (Ojeka et al., 2021) because of the confusion about whether they should emphasize financial reporting risks or other risks. Previous studies mostly looked at the ACs' role in internal audits (Vadasi et al., 2021), external audits (Saeed et al., 2022) and financial reporting (Shepardson, 2019), and their contributions in financial restatement (Das et al., 2020), firm performance (Meah et al., 2021) and environmental disclosures (Wang & Sun, 2022). ACs' risk management role is rarely addressed. Scholars have called for further research into ACs' practice to better understand the role they perform (Martinov-Bennie et al., 2015; Compernolle, 2018; Khemakhem & Fontaine, 2019). This study aims to fill the identified gap by focusing on AC's role in risk management.

Thirdly, while the Malaysian Code of Corporate Governance (MCCG) mandates that all ACs should be non-executive directors, with a majority of independent directors, additional efforts are still required to enhance the AC independence level (Wan Mohammad et al., 2016). AC independence is generally measured using the proportion of independent or non-executive directors in ACs (Suárez et al., 2012; Sarpal, 2017). However, some papers pointed out that AC stockholding is a more important measure for substantive independence compared to AC independence status, which merely confirms procedural independence (Bolton, 2012; Church

et al., 2018; Salehi et al., 2020). As none of the prior literature has examined whether AC stockholdings influence the CEO characteristics in adopting risky investments, this study goes a step further to provide the answers.

Fourthly, while Malaysia has experienced rapid economic reforms where the economic gap between Malays and Chinese has narrowed, the BOD ethnicity issue is still under-explored even after MCCG 2007 (Wan Mohammad et al., 2016). Most of the Malaysian studies have focused on the effect of BOD ethnicity on risk-taking (Tee, 2019; Lee et al., 2019) instead of specific BOD sub-committees such as AC. So far, only a few Malaysian studies have explored AC ethnicity, such as its impact on corporate fraud (Kamarudin & Wan Ismail, 2014), audit fees (Johl et al., 2012) and analysts' accuracy in forecasting (Marzuki et al., 2020). As Malaysia exhibits a unique institutional setting as a multiracial country, this paper adds to the literature by examining the contingent nature of the relationship between CEO characteristics and risk-taking with AC ethnicity as a moderator.

This study is also expected to carry a positive implication for social change by guiding the shareholders and BOD to formulate suitable CEO hiring, AC ownership and nomination policies. BOD may be more confident in monitoring firm risk-taking on behalf of their shareholders than before. Investors may also use the results to improve efficiency in revising investment portfolios. In short, this study can be useful to both organizations and society.

2 Literature Review

2.1 Upper echelons theory

By being accountable to the BOD, CEOs carry major risk-taking responsibilities, which can influence firms' relative success heavily in today's dynamic business environment (Chen, 2013). While poor financial health and complex financial products have played their part in corporate governance failures, all too often, CEOs have been blamed for excessive risk-taking gone wrong (Gontarek & Belghitar, 2020). UET by Hambrick and Mason (1984) posits that top managers' attributes affect their decision-making and subsequently are reflected in organizations' outcomes. This theory is based on the concept of bounded rationality, in which relevant business information is too extensive for executives to understand every dimension of it (Lee & Moon, 2016). As a result, executives tend to interpret strategic situations based on their cognitive base and values, which narrows their field of vision and leads to a personalized and selective perception (Hambrick & Mason, 1984). As measuring cognitive bases is difficult, it is suggested that demographic characteristics can be alternative proxies due to their easy observability (Hambrick & Mason, 1984). A further update by Hambrick (2007) indicated that despite the inability of demographic traits to detect true psychological processes, researchers had confirmed the strong relationships between executive demographic characteristics and organizational outcomes. Bertrand and Schoar (2003) also confirmed that organizational behaviours were affected by managers over and above firm-specific and time characteristics. Extensive studies have applied UET to explore the accountability of CEOs' demographic traits on strategic choices, including research and development (R&D) spending (Chen, 2013), environmental disclosures (Oware & Awunyo-Vitor, 2021) and innovation (You et al., 2020).

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2.2 Risk-taking

According to Lowrance and Klerer (1976), risk is a measure of the severity and likelihood of detrimental impacts. Nobre et al. (2018) defined risk as the uncertainty level associated with decision-making and implementation of activities in achieving certain goals. Literature has acknowledged that risk-taking is the dominant feature of entrepreneurship and a determinant of firm performance (Putniņš & Sauka, 2019; García-Lopera et al., 2021). Nonetheless, scholars are not unanimous about the width and extensiveness of the positive association between risk-taking and performance. On the one hand, risk-taking is said to be facilitating for firms to respond to competitive threats and obtain a competitive advantage, thereby enhancing performance (Covin & Lumpkin, 2011). On the other hand, other research has documented a non-linear relationship (Kreiser et al., 2012) or an insignificant association (Donkoh et al., 2021). Other than performance, higher risk-taking also affects other firm aspects, such as higher real earnings management (Alharbi et al., 2021), lower stock return volatility (Lee, 2019) and higher cost of equity capital (Berry-Stölzle & Xu, 2016). As such, management and BOD are increasingly expected to properly manage the firm's risk portfolio because stakeholders not only demand higher returns but also sustainability and security (Busru et al., 2019). Much literature has indicated that corporate risks can be mitigated through strategies such as diversification (Thành et al., 2020), hedging (Bartram et al., 2011) and cash holdings (Arora, 2019). Recently, Mulia and Joni (2019) demonstrated that corporate social responsibility reduces operating risks in Indonesia. Ownership structure, such as family ownership, is also found in countless studies to have a negative impact on risk-taking (Gottardo & Moisello, 2017; Camisón-Zornoza et al., 2020). Besides, Ding et al. (2021) described that internationalization positively affects firms' risky strategies measured by innovation. Based on the arguments, it is noted that many factors can influence risk-taking. Hence, it is of central importance to comprehend the multiple perspectives of CEOs in adopting risk-taking behaviour.

2.3 CEO age

It has been suggested that CEOs' mindsets, experience and risk attitudes change as they get older (Davidson et al., 2006). Notwithstanding decades of an established body of empirical investigations, the influence of CEO age on risk-taking is still debatable (Liu & Jiang, 2020). Older executives have lesser physical and mental stamina, so they may avoid the complex information processing required to implement organizational changes (Child, 1972). Kaur and Singh (2020) contended that older CEOs adopt lesser financial leverage. They explained that older CEOs may be at a stage in their lives that overemphasizes career stability and financial security, as they are reaching the point where they would need to cash out and would like to maximize their post-retirement financial position. Therefore, they avoid any risk that interrupts their established community circles and expectations about retirement earnings. In addition, Matta and Beamish (2008) reported that older CEOs who have shorter career horizons view retirement as a time of career evaluation; hence, they prefer legacy conservation and engage in fewer international acquisitions. Zhang and Rajagopalan (2010) affirmed that an increase in age prevents CEOs from taking long-term risks that may destroy their personal reputation, given the insufficient time to undo the unfavourable effect of long-term projects. Similarly, Chowdhury and Fink (2017) revealed a negative association between CEO age and risk-taking measured by capital expenditure and R&D. Yeoh and Hooy (2020) identified that younger executives who crave more career success adopt more R&D, capital

expenditure and leverage as they are eager to signal their ability and enhance future career opportunities. This is supported by Andreou et al. (2017), who claimed that younger CEOs are more probably to experience stock price crashes. Elia et al. (2021) also asserted that younger CEOs are more likely to pursue cross-border mergers and acquisitions in unrelated industries.

However, some research has ascertained a positive association between CEO age and risk-taking. Younger executives encounter more reputation and professional concerns due to a yet unestablished reputation (Serfling, 2014). If younger CEOs undertake risky strategies with unforeseeable profit, it may cause losses or even more serious outcomes such as bankruptcy. Accordingly, they may be disciplined by the managerial external labour market more brutally, such as dismissal and fewer future career opportunities (Gibbons & Murphy, 1992), which is very costly for younger CEOs. Drawing on a sample of Chinese A-share listed companies, Li et al. (2021) reckoned that CEO decision horizon based on CEO age positively affects R&D. Phua et al. (2018) posited the same outcome with risk-taking measured by foreign exchange gains or losses. In contrast, some scholars have documented a non-significant relationship between CEO age and risk-taking (Kish-Gephart & Campbell, 2015; Lee & Moon, 2016). Campbell et al. (2019) established that CEO age does not have a significant moderating effect on the relationship between CEO birth order and risk-taking. In the present study, the effect of CEO age on risk-taking is investigated further by adding other moderators.

2.4 CEO tenure

Tenure mirrors CEOs' skills, knowledge, paradigms and cognition orientation, which explains why their risk preferences change over their tenure (Tang et al., 2015). Some research has supported the idea of a negative link between CEO tenure and risk-taking. As a CEO's tenure progresses, their sources of information and knowledge base become narrower because of the establishment of informational routines (Li & Yang, 2019), eventually restraining them from entrepreneurial venturing (Luo et al., 2013). For instance, McDonald and Westphal (2003) postulated that longer-tenured CEOs prefer seeking advice from their own counsels instead of managers at other firms. Hsu et al. (2020) concluded that long-tenured CEOs engage in less R&D, implying that they isolate themselves from the external environment and turn to an approach that delivered them success in the past. Oppositely, short-serving CEOs have diverse and fresh information and are apt to venture into unexplored opportunities to boost their reputation as capable leaders (Lee et al., 2016). Lee and Moon (2016) mentioned that long-tenured CEOs avoid strategic risks due to the high valuation of job stability and reputations. Furthermore, long tenure allows CEOs to have more time and power to build a top management team (TMT) of their own choosing, which enables them to surround themselves with people who have a similar mindset and eventually be conducive to strategic conformity (Finkelstein & Hambrick, 1990; Wang et al., 2016). Loukil and Yousfi (2022) also outlined that CEOs' lengthy tenure is associated with decreased innovation outcomes in the high-tech industry.

Contrarily, other scholars have introduced the expertise hypothesis, where long-serving CEOs have enhanced knowledge and experience in managing strategic risks (Janney & Dess, 2006). This experience enables them to improve the process of determination of risky strategies that possess the highest probability of success (Xie, 2014; Kao & Chen, 2020). He

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et al. (2021) argued that CEO tenure positively affects firms' risky decisions on brand equity investment in China. This is because, over time, CEOs accumulate knowledge, social capital and power that are valuable to them for utilizing internal and external information when making decisions. It also enables them to become overconfident, eventually inducing them to implement riskier projects. Using a sample of 25 large Dutch firms during the period 1966-1998, Barkema and Chvyrkov (2017) concluded that as CEOs' tenure advances, the degree of internationalization increases. Li & Yang (2019) asserted that CEO tenure is positively related to the percentage of exploitative innovation among publicly traded US pharmaceutical firms. Kaur and Singh (2020) also found that an increase in CEO tenure encourages more risk-taking and results in better firm performance. They concluded that long-tenured CEOs can reinforce industrial networks with important stakeholders, which in turn provides more opportunities for them to engage in risky initiatives. It is a matter of whether the extended tenure's liabilities of maintaining the status quo exceed the benefits of enhanced knowledge and experience. On balance, the effect of CEO tenure on risk-taking remains unclear; therefore, it is further explored in this paper.

2.5 CEO gender

There are stereotypes about the distinctions between men and women in abilities, attitudes and behavioural patterns (Expósito et al., 2021). Most of the studies have identified that males are more risk-seeking than females in their decision-making (Buratti et al., 2018; Hoang et al., 2019; Faisal, 2020). Expósito et al. (2021) asserted that male CEOs possess a higher propensity to introduce process innovations compared to their female counterparts. This is in line with social and constructionist feminist theories, inferring that gender is a socialization construct influencing managerial behaviour. Palvia et al. (2015) presented that female-led banks are more conservative and hold about 5-6% more equity capital than male-led banks. They also found that female CEOs have lesser default risk during financial crises, signalling that female-induced conservatism is especially significant for banks' survival. Tran et al. (2020) demonstrated that women at the firm management level reduce downside risk among Vietnamese PLCs. Martín-Ugedo & Minguez-Vera (2014) documented that female CEOs adopt a lower degree of financial leverage and debt ratio. Dohse et al. (2018) also reported similar results where female CEOs have a lower tendency to introduce product innovations.

Besides, Faccio et al. (2016) claimed that female executives take up lesser leverage, which may be due to discrepancies in risk resistance, job loss risk and self-confidence level. This is confirmed by prior studies (Taylor & Hood, 2011; Lim & Envick, 2013; Zalata et al., 2019), which have affirmed that women are less confident than men. Herbst (2020) established that a lack of confidence triggers women to underestimate their performance and skills by not taking credit for success. A possible reason is that women are fearful of getting adverse comments about their personality if they behave aggressively, and they are often asked to tone down interpersonal behaviour (Rudman et al., 2012). Among other studies, Ashourizadeh et al. (2014) and Belás et al. (2015) found no evidence of gender differences in self-confidence levels. Adams and Ragunathan (2013) reckoned that while women are not necessarily linked with risk aversion, their presence on the board is helpful to reduce bank risk in crises.

Other papers have suggested an alternative point where female CEOs engage in more risk-taking. Mukarram et al. (2018) examined the effect of women directors on risk-taking

measured by R&D based on a sample of 71 Indian listed technology companies. They revealed that the percentage of women directors is positively associated with R&D, which is against the traditional literature notion that women are risk-averse. Berger et al. (2014) contended that the higher the proportion of female directors on boards in German banks, the higher the portfolio risk. Using a sample of more than 30 developing countries, Na and Shin (2019) posited that there are no significant gender differences in the likelihood to introduce process, product and organizational innovations. Consistent with liberal feminist theory, Biga-Diambeidou et al. (2021) found no gender differences relating to risk-taking decisions. Sila et al. (2016) also did not observe any significant impact of the presence of women directors on firms' equity risk. In short, the existing evidence on the role of CEO gender on risk-taking is still under debate and further research is required.

2.6 Audit committee ownership

Since the implementation of the MCCG, the AC independence level has been enhanced (Wan Mohammad et al., 2016). To measure their independence for corporate governance effectiveness, the proportion of independent or non-executive directors in AC is generally used (Suárez et al., 2012; Sarpal, 2017). However, Bolton (2012) postulated that AC independence measured by stockholdings positively affects firm performance, while independence measured by compliance with the independence requirements of the regulation is found to be insignificant. This implies that stockholding may be a more important measure for assessing AC independence (Church et al., 2018; Salehi, 2020).

While regulators recognize the importance of AC independence, the academic literature, however, is mixed regarding its benefits. Previous research has deduced that independent ACs reduce earnings management (Toumeh et al., 2020), improve financial reporting quality (Kantudu & Samaila, 2015), decrease the probability of restatement (Lary & Taylor, 2012) and appraise internal controls more objectively (Abbott et al., 2004). Ojeka et al. (2021) observed that AC independence minimizes liquidity risk. If using shareholdings to measure independence level, Habib et al. (2020) asserted that AC ownership reduces the cost of equity. This is because stockholdings reduce agency problems by aligning ACs' interests with those of shareholders; therefore, they have a better understanding of how much importance shareholders attach to genuine risk practices (Akhor & Oseghale, 2017). In that case, they are more inclined to implement strategies that minimize potential inappropriate risks. MacGregor (2012) documented that the relationship between AC stockholdings and the probability that a firm meets an earnings threshold varies with the risk of reporting problems. His results showed that stockholdings increase ACs' ability to hinder managerial opportunism when risk factors are present, meaning that they have greater responsiveness to risk factors. Without any conflict of interest, ACs can question management decisions more easily when necessary (Larasati et al., 2019). These results are consistent with the "incentive alignment" view.

A contrary view has argued that AC independence is not necessarily a successful governance mechanism which can improve risk management. Some papers have claimed that AC independence decreases firms' share prices (Khan & Ibrahim, 2017) and return on assets (Sarpal, 2017). These findings do not support the agency theory, which favours the monitoring role played by outside directors. Farooq et al. (2020) also claimed that higher AC independence increases the probability of financial distress. Busru et al. (2019) posited that

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a higher proportion of independent directors increases risk-taking measured by R&D intensity, financial leverage, compensation risk and volatility of annual share prices. There is also evidence supporting the "entrenchment" view, where shareholdings compromise AC independence in pressurizing management to perform their statutory and fiduciary responsibilities in risk management. Bhuiyan and D'Costa (2020) stated that equity-based compensation may tie ACs' wealth to the company's short-term and long-term financial performance and lead to ineffective oversight, which in turn increases audit report lag. Sharma and Kuang (2014) documented that the higher the AC stockholdings, the higher the risk of aggressive earnings management as it motivates them to manipulate the earnings to increase the stock price. Likewise, Saeed et al. (2022) identified that AC ownership can reduce the likelihood of an auditor issuing a going-concern report, meaning that shareholdings adversely affect ACs' objectivity and bias them towards accepting questionable practices. Based on the discussions, it is expected that AC ownership can act as a moderator between CEOs' characteristics and risk-taking.

2.7 Audit committee ethnicity

Fitzsimmons (2013) described that each culture has its own set of norms, beliefs and values that shape a specific society's worldview, which may result in different decision-making approaches (Katmon et al., 2017). To predict different ethnic groups' risk-taking behaviour, it is imperative to ascertain their cultural value dimensions, as highlighted by Hofstede (1983), such as uncertainty avoidance, individualism level, masculinity and power distance. Many studies have asserted that Malays have lower individualism, power distance, higher feminism and uncertainty avoidance, leading to lower risk-taking (Chen et al., 2015; Ashraf et al., 2016). Malays are often perceived as more oriented towards harmony and relationship building, while Chinese are believed to be more materialistic (Lim, 1998). Tehseen and Anderson (2020) concluded that Malay entrepreneurs are closely attached to their customs and create a less individualistic culture, which adversely affects firm performance. Al-Absy et al. (2019) established that an AC chaired by a Malay director tends to follow Islamic ethics that emphasize compliance, faith in God, non-aggression, obedience and reciprocal obligations. Hooy and Ali (2017) mentioned that Muslim CEOs are connected to poorer performance, as their financing decisions are driven by the guidelines for appropriate religious behaviour instead of value creation. Accordingly, Malays have high uncertainty avoidance which increases their effectiveness in monitoring earnings management practices. The same result was found by Ismail et al. (2021). Besides, Hamzah et al. (2002) found that Malays who have high collectivism and uncertainty avoidance prefer a participant leadership style that is apt to subject decisions to the overall interest of stakeholders, which results in lesser risk-taking. Marzuki (2022) also supported the arguments by confirming that a higher proportion of Malay ACs who are more conservative give rise to higher analyst forecast errors.

Through the introduction of NEP, Malay directors gain preferential access to projects, finance and government bailouts during periods of financial crisis, which promotes cronyism and nepotism (Abdul Wahab et al., 2020). This provokes firms to employ Malay directors for their political connections rather than their expertise in conducting business (Wan Mohammad & Wasiuzzaman, 2020). KPMG (2013) documented that former Malay politicians or retired civil Malay servants made up almost half of the Top 100 Malaysian firms' independent directors. Abdul Wahab et al. (2020) reported that close political connections of Malay directors may threaten their perceived independence and lead to an expropriation of assets. On a sample

of 121 Iranian PLCs, Kashanipour et al. (2020) argued that political connections induce higher tax aggressiveness. Similarly, Wan Mohammad et al. (2016) reported that firms with more Malay directors are linked to higher earnings management. These results indicate a poor corporate governance mechanism, which may trigger inefficiency and excessive risk-taking. This is supported by Johl et al. (2012), who revealed that auditors tend to assess higher inherent risk when there is a Malay-dominant AC because they have a poorer reputation in business management. Furthermore, Malays' individualism may be increased throughout the years due to increased modernization and globalization in Malaysia (Haniffa & Cooke, 2002). Accordingly, Malay traditional values that focus on humbleness and relationships may diminish, and they may be less susceptible to making decisions subjected to group consensus (Díez-Esteban et al., 2018), which positively affects risk-taking. Nevertheless, some studies have revealed that there are no differences between ethnicity in terms of board effectiveness (Hamid, 2018), earnings management (Wan Mohammad & Wasiuzzaman, 2020), accounting conservatism (Yunos et al., 2012) and audit fees (Johl et al., 2012). By focusing on the moderating effect of AC ethnicity on risk-taking, this study could add to the literature that has been focusing on BOD only.

3 Hypotheses

Figure 1 below shows the relationships of these hypotheses with risk-taking.

$H1_0$: CEO age does not significantly affect risk-taking.

$H1_a$: CEO age significantly affects risk-taking.

$H2_0$: CEO tenure does not significantly affect risk-taking.

$H2_a$: CEO tenure significantly affects risk-taking.

$H3_0$: CEO gender does not significantly affect risk-taking.

$H3_a$: CEO gender significantly affects risk-taking.

$H4_0$: AC ownership moderates the relationship between CEO age and risk-taking.

$H4_a$: AC ownership does not moderate the relationship between CEO age and risk-taking.

$H5_0$: AC ownership moderates the relationship between CEO tenure and risk-taking.

$H5_a$: AC ownership does not moderate the relationship between CEO tenure and risk-taking.

$H6_0$: AC ownership moderates the relationship between CEO gender and risk-taking.

$H6_a$: AC ownership does not moderate the relationship between CEO gender and risk-taking.

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$H7_0$: AC ethnicity moderates the relationship between CEO age and risk-taking.

$H7_a$: AC ethnicity does not moderate the relationship between CEO age and risk-taking.

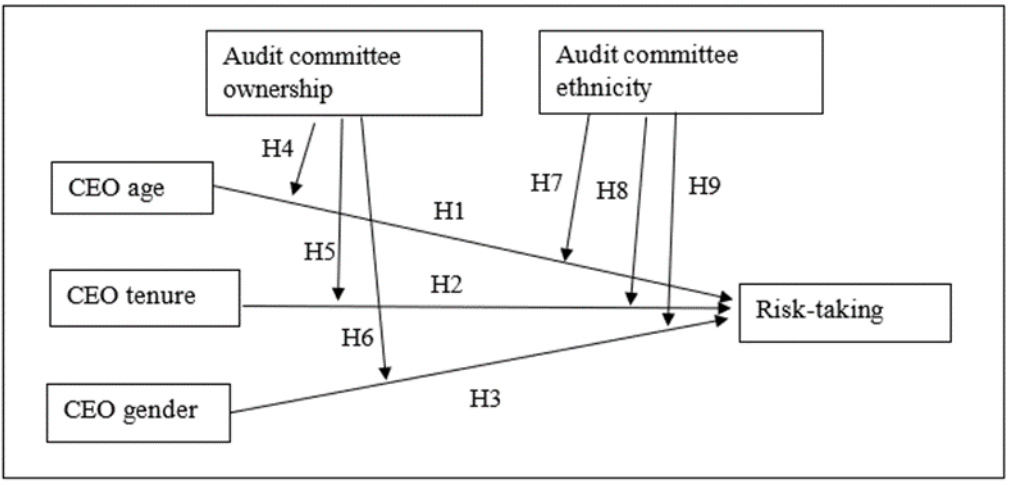
$H8_0$: AC ethnicity moderates the relationship between CEO tenure and risk-taking.

$H8_a$: AC ethnicity does not moderate the relationship between CEO tenure and risk-taking.

$H9_0$: AC ethnicity moderates the relationship between CEO gender and risk-taking.

$H9_a$: AC ethnicity does not moderate the relationship between CEO gender and risk-taking.

Figure 1 | Conceptual framework



Source: authors

4 Methodology

4.1 Research design

Most studies examining corporate risk-taking have used secondary data (Matta & Beamish, 2008; He et al., 2021) because of their objectivity, easy access to difficult populations and availability of longitudinal data. In addition, CEOs are most likely to be actively occupied and have a low response rate to surveys or interviews, thus; secondary data have been used.

As research into the impacts of CEO and AC attributes on risk-taking is feasible only after the events have happened over a period, ex-post facto research is more appropriate (Sharma, 2019). It is usually applied as an alternative to true experimental research to test hypotheses about cause-and-effect relationships.

4.2 Sample

Purposive sampling was applied in this study. The sample of this research includes the largest 100 PLCs on the Main Market of Bursa Malaysia as of 1 June 2022 based on market capitalization over the period 2015-2020. Previous studies have also focused on the largest companies to obtain more consistent results (Wang et al., 2016), as larger companies have distinct structures and contexts compared to smaller companies. Only PLCs were included to avoid the difficulty of collecting data in privately held companies. Besides, Bursa Malaysia's listing requirements mandate all PLCs' financial statements to be prepared and audited according to the Malaysian Accounting Standards Board and the Companies Act 2016. This means that all financial data are comparable and reliable. Data collection for this study covers a 6-year financial period from 2015 to 2020 because it would be long enough to smooth out the fluctuations of variables (Belanes & Hachana, 2010). The sample period ends in 2020 to avoid the unavailability of annual reports for 2021, as some of their financial years may not yet end by 1 June 2022.

There are four selection criteria for the sample. First, all banks, finance-related companies, unit trusts, insurance and utility companies were excluded from the sample because of their difference in financial reporting standards and regulatory requirements, which is consistent with prior research (Jiraporn et al., 2012; Veprauskaitė & Adams, 2013). Secondly, only those companies that were listed on the Main Market of Bursa Malaysia before 2014 were retained. Thirdly, the complete annual reports must be available from 2014 to 2020. Lastly, all data regarding dependent, independent and moderating variables must be available. Having excluded the firms on the above basis, the final sample consists of a balanced panel of 100 firms from various industries and 600 firm-year observations.

4.3 Data collection

All data were hand-collected from the companies' annual reports that are publicly available on the Bursa Malaysia website. Following previous studies, missing data for dependent variables were set to zero value as this study assumes that the companies do not engage in those strategies if the companies do not report them (Shropshire et al., 2021). When collecting data, it was noticed that many PLCs do not have a CEO. As the managing director's duties and power are similar to a CEO's, this study assumes that the managing director and the CEO are the same. If a CEO is absent in a company, the managing director's profile was used.

4.4 Dependent variable measurement

The confusion over the measurement of risk has been addressed in several studies (Sanders & Hambrick, 2007; Andretta, 2013), as it hinders the advancement of risk literature (Shammari, 2018). Some studies refer to "risk-taking" as organizational risk, which is the organization's volatile income streams arising from managerial actions (Haider & Fang, 2016; Jumreornvong et al., 2019). Some refer to "risk-taking" as managerial risk, which is the management's willingness to commit to strategic choices that possess significant and uncertain outcomes (Palmer & Wiseman, 1999). To avoid capturing the impact of exogenous industry factors (Armstrong & Vashishtha, 2012) and to understand risky managerial decisions instead of the actual results of those decisions, managerial risk-taking is employed in this study. Previous studies have aggregated and logged the R&D, capital expenditure and

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acquisition to proxy for managerial risk-taking, as they typically substitute for one another (Campbell et al., 2019; Mount & Baer, 2021). This study uses the same measurement, but R&D is replaced by financial leverage to account for the financial dimension of managerial risk-taking. In short, the sum of financial leverage, capital expenditure and acquisition are aggregated and logged, forming a risk-taking index.

Leverage (LEV) is defined as the long-term debt held by the firm at the accounting year-end (Huang & Wang, 2015). Long-term debt better measures the riskiness of financing strategies as too much long-term debt exposes firms to the overwhelming pressure of interest payments and fixed obligations, leading to a higher interest rate risk, insufficient working capital and ultimately bankruptcy (Griffin et al., 2009).

Capital expenditure (CAPEX) is measured as the total value of capital expenditure spent by the company during the year (Liu et al., 2019). This includes, for instance, purchase of property, plant and equipment and intangible assets such as patents and rights. This measurement is supported by Sanders and Hambrick (2007), who claimed that capital investment is one of the indicators of risky behaviour.

Acquisition investment (ACQ) is measured as the total transaction value for all acquisitions during the year (Wan & Yiu, 2009). It includes the acquisition of investment in subsidiaries, associates and joint ventures. Acquisition has been widely adopted by research as a measure of a risky and uncertain long-term strategy (Shropshire et al., 2021). It requires major resource commitment, has a high integration difficulty level and may divert managers' energy from other strategic goals to integrate newly acquired firms.

4.5 Independent variable measurement

Demographic traits were used as proxies for a CEO's risk-taking propensity because they provide high content validity, replicability, objectivity and logical coherence (Tihanyi et al., 2000). CEO age (CAGE) is measured as the number of years since the CEO was born (Serfling, 2014). CEO tenure (CTENURE) is calculated as the number of years since the CEO was appointed to the office (Luo et al., 2013; Wang et al., 2016; Li & Yang, 2019). Both variables were used as continuous variables without any classification to avoid generalizations and correlation with managerial risk-taking (Amador & Gustavsson, 2020). CEO gender (CGEN) is measured as a dummy variable, which equals 1 for females and 0 for males (Ashafoke et al., 2021; Ullah & Naveed, 2021).

4.6 Moderating variable measurement

AC ownership (ACO) is measured as the total dollar value of stock owned by all AC members (Bolton, 2012). All directors' direct and indirect interests in the company were included. Numerous studies have focused on the percentage of stock owned by directors (Bhuiyan & D'Costa, 2020; Habib et al., 2020). However, Bhagat et al. (1999) revealed that the dollar value of directors' stockholdings significantly affects firm performance, but no relationship was found when considering the proportion of ownership. Likewise, Bolton (2012) asserted that firms with the highest dollar value of AC stockholdings perform better than firms with lower ownership. Overall, it is affirmed that directors are motivated by stock and cash incentives, as they are economic agents concerned with the utility of wealth (Bolton, 2012). Their motivation to promote risk-taking may be captured better using a measure of the total

dollar value of shareholdings. AC ethnicity (ACE) is calculated as the percentage of Malay directors to total directors on the AC (Yunos et al., 2012; Marzuki, 2022).

4.7 Data analysis

After data collection, missing data were checked. The natural logarithm was used for all variables in the model estimation to reduce skewness and ease interpretation (Ozdemir & Erkmen, 2022), except the AC ethnicity and CEO gender variables.

Most of the studies that have explored the relationship between CEO characteristics and risk-taking have applied regression analysis, such as ordinary least square regression (Shammari, 2018), panel regression (Palvia et al., 2015) and GMM regression (Foong et al., 2021). Since there may be other unobserved factors which are significant for risk-taking but which will perhaps never be observable for the researcher, panel data analysis where the same firms are observed in a number of years was applied to empirically test the hypotheses. Following the prior studies (Huybrechts et al., 2012; Wang et al., 2016), multiple linear regression was used to evaluate the linear effect of CEO characteristics on risk-taking. It is a statistical test that appropriately examines the separate and collective effects of several independent variables on a dependent variable (Hair et al., 2014).

To explore the moderating impact of AC ownership and ethnicity, moderation analysis was done using Hayes' process macro model 1. Hayes' process model automatically creates an interaction term between the independent and moderating variables (Sloan, 2018). It has been used by many researchers to conduct moderation analysis (Ehiorobo, 2020; Oduaran & Agberotimi, 2021). For the endogeneity problem, researchers either have not addressed it (Gupta et al., 2016) or have used the generalized method of moments (GMM) regression (Veprauskaitė & Adams, 2013). Following prior studies to minimize the endogeneity problem (Sheikh, 2019), a one-year lead will be used, in which the effect of the independent variables and moderating variables at *t* will be examined on the dependent variable at the year *t*+1.

5 Analysis

5.1 Descriptive statistics

Table 1 presents the descriptive statistics of the variables, with a total of 600 firm-year observations. Standard deviations of all the variables except LCAGE exceed 0.10, implying that the distribution provides adequate variations to test for the effect of CEOs' and ACs' attributes on risk-taking.

As all the risk-taking indicators, LEV, CAPEX and ACQ are highly skewed, it is better to use the median instead of the mean to explain the central data value. LEV has a median value of RM 126.2 million, with a maximum value of RM 34,351.9 million and a minimum value of 0. Around 19.5% of Malaysian PLCs did not take up any long-term debt from 2015 to 2020. This zero-leverage behaviour is a persistent phenomenon, which is supported by Strebulaev and Yang (2013), who found that an average of 10.2% of large US PLCs had zero debt from 1962 to 2009. CAPEX has a median value of RM 82.7275 million and ranges from RM 0.09821 million to RM 8,512.624 million. The median value of ACQ is RM 0, ranging from RM 0 to RM 6,438.2 million. A zero median value indicates that over half of the Malaysian PLCs did not engage in acquisition investment during the observation period. Averagely, Malaysian PLCs adopt lower acquisitions than leverage and capital expenditure. This may be because

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acquisition investment requires expensive coordination costs and extensive effort for the integration process, where an increase in shareholder wealth is highly unguaranteed (Putri, 2018). Leverage has the highest median among the three risk-taking indicators. This may be because companies take up long-term debt to finance other risky investments such as capital expenditure and acquisition.

The mean value of LRISK is 5.53, which is slightly higher than the findings of Mount and Baer (2021) in the USA (4.21), but much lower than the findings of Campbell et al. (2019) in Korea (19.27). This signals that Malaysian PLCs take higher risks than US PLCs but lower risks than Korean PLCs.

CEO age ranges from 28 to 79 years old, with an average of 56 years old, which is similar to the finding of Eduardo and Poole (2016) (56.87 years old) but higher than that of Jardine and Duong (2021) (49.60 years old). The longest tenure of a CEO is 45 years, which is lower than that found by Oktaviani et al. (2022) (48 years). The average tenure of CEOs is 10.10 years, which is higher than the finding of Ghardallou (2022) (9.356 years). Most of the CEOs have a minimum one-year tenure, meaning that there are many new CEOs in the sample. CEO gender has a mean value of 0.03, suggesting that 97% of Malaysian CEOs in the sample are male, and the remaining 3% are female. A similar higher proportion of men-led businesses is found by Amador and Gustavsson (2020) in Scandinavia, in which only 11% of the CEOs in their sample are female.

AC ownership ranges from RM 0 to RM 201.416 million. The average value of AC stockholdings is approximately RM 2.5 million, which is much lower than the US funding ($24 million) (Bolton, 2012). This infers that Malaysian PLCs discourage directors from taking up more shareholdings compared to developed countries. This may be due to Malaysian PLCs being highly concentrated with family dominance (Foong et al., 2021), in which family owners are keener to keep the firm in the family's hands (Gottardo & Moisello, 2017).

AC ethnicity varies between 0 and 1, with an average value of 0.4. This indicates that 40% of ACs in Malaysian PLCs are made up of Malay directors on average, which is consistent with the finding of Yunos et al. (2012) of 41% from 2001 to 2007.

Table 1 | Descriptive statistics

	N	Mean	Median	Mode	Std. dev.	Min	Max	Int. range
CAGE	600	56	56	59	8.86	28	79	12.75
LCAGE	600	1.74	1.75	1.77	0.07	1.45	1.9	0.1
CTENURE	600	10.1	7	1	9.55	1	45	12
LCTENURE	600	0.79	0.85	0	0.46	0	1.65	0.7
CGEN	600	0.03	0	0	0.18	0	1	0
ACO	600	2,563,999.52	21,000.50	0	15,542,004.95	0.00	201,416,668.00	301,680.00
LACO	600	3.27	4.32	0	2.68	0	8.3	5.48
ACE	600	0.4	0.33	0.33	0.3	0	1	0.47
LEV"	600	1,499,454.90	126,200.00	0	3,468,283.02	0.00	34,351,900.00	1,253,283.26
CAPEX "	600	432,249.73	82,727.50	98.21^b	1,042,793.02	98.21	8,512,624.00	279,988.55
ACQ "	600	90,456.11	0.00	0	443,249.65	0.00	6,438,200.00	13,722.48
RISK	600	2,022,160.74	333,548.27	98.21^b	4,507,115.41	98.21	42,231,700.00	1.476,770.25
LRISK	600	5.53	5.52	1.99^b	0.92	1.99	7.63	1.36

Source: authors (from SPSS table)

5.2 Pearson correlation

Table 2 demonstrates a two-tailed Pearson correlation. As predicted, all the measures of risk-taking, LEV, CAPEX and ACQ are positively correlated ($r = 0.374, 0.767, 0.331, p < 0.01$). These variables are also positively and highly correlated with LRISK ($r = 0.633, 0.29, 0.539, p < 0.01$). This shows that they are appropriate measures of managerial risk-taking. LCAGE and LCTENURE have the highest positive and significant correlation ($r = 0.468, p < 0.01$), which is expected as older CEOs mostly have longer tenure.

The results show a small, significant negative correlation between LCAGE and LRISK ($r = -0.115, p < 0.01$), implying that older CEOs exhibit less risk-taking behaviour. ACE also has a small, significant positive correlation with LRISK ($r = 0.186, p < 0.01$), suggesting that a higher proportion of Malay ACs is connected to higher risk-taking.

The correlation between LCTENURE, CGEN, LACO and LRISK is insignificant ($p > 0.05$), meaning that there is no association between CEO tenure, gender, AC ownership and risk-taking. Nevertheless, a bivariate correlation may not offer great insights into CEO characteristics' effect on risk-taking, as the interrelationship among the variables should be controlled to fully comprehend the relationship. This is supported by previous research into CEO characteristics that has revealed small or non-significant bivariate correlations but significant and practical effects in multivariate models (Gamache et al., 2015; Campbell et al., 2019).

Table 2 | Correlations

		LRISK	LEV	CAPEX	ACQ	LCAGE	LCTENURE	CGEN	LACO
LRISK	Pearson correlation	1	0.633 **	0.539 **	0.290 **	-0.115	-0.075	-0.027	-0.044
	Sig. (2-tailed)		0	0	0	0.005	0.065	0.507	0.277
	N	600	600	600	600	600	600	600	600
LEV	Pearson correlation	0.633 **	1	0.767 **	0.374 **	0.006	-0.039	-0.033	-0.044
	Sig. (2-tailed)	0		0	0	880	0.344	0.42	0.287
	N	600	600	600	600	600	600	600	600
CAPEX	Pearson correlation	0.539 **	0.767 **	1	0.331 **	0.04	-0.03	-0.006	-0.092
	Sig. (2-tailed)	0	0		0	0.326	0.461	0.887	0.024
	N	600	600	600	600	600	600	600	600
ACQ	Pearson correlation	0.290 **	1	0.332 **	1	0.013	-0.032	-0.037	-0.089
	Sig. (2-tailed)	0		0		0.75	0.434	0.36	0.03
	N	600	600	600	600	600	600	600	600
LCAGE	Pearson correlation	-0.115	0.767 **	0.04	0.013	1	0.468 **	-0.035	-0.09
	Sig. (2-tailed)	0.005	0	0.326	0.75		0	0.393	0.028
	N	600	600	600	600	600	600	600	600
LCTENURE	Pearson correlation	-0.075	0.374 **	-0.03	-0.032	0.468 **	1	-0.033	0.195 **
	Sig. (2-tailed)	0.065	0	0.461	0.434	0		0.419	0
	N	600	600	600	600	600	600	600	600
CGEN	Pearson correlation	-0.027	0.006	-0.066	-0.037	-0.035	-0.033	1	0.025
	Sig. (2-tailed)	0.507	0.88	0.887	0.36	0.393	0.419		0.537
	N	600	600	600	600	600	600	600	600
LACO	Pearson correlation	-0.044	-0.039	-0.092	-0.089	-0.09	.195 **	0.025	1
	Sig. (2-tailed)	0.277	0.344	0.024	0.03	0.028	0	0.537	
	N	600	600	600	600	600	600	600	600
ACE	Pearson correlation	0.186 **	-0.033	-0.032	0.027	0.011	-0.065	-0.065	-0.129
	Sig. (2-tailed)	0	0.42	0.433	0.516	0.791	0.114	0.112	0.002
	N	600	600	600	600	600	600	600	600

Source: authors (from SPSS table)

5.3 Multiple linear regression

For valid multiple regression analysis, the model was tested, and it met the normality, homoscedasticity and linear assumptions. All the variables' correlation coefficients in Table 2 have a magnitude lower than 0.8. Analysis of collinearity statistics reveals that all the

variation inflation factor values are below 5 and all the tolerance scores are above 0.2 (Table 3); thus, there is no multicollinearity problem (Hair et al., 2014). The results can be used to investigate the hypotheses reliably.

Multiple linear regression results are presented in Table 3. The R-squared value of 0.015 signals that only 1.5% of the variances in risk-taking can be predicted by CEO age, tenure and gender. The remaining 98.5% of the variances in risk-taking are influenced by other factors that are excluded from the model. Although the R-squared value is very low, the p-value of 0.031 illustrates that the overall model can reliably predict a statistically significant amount of variances in risk-taking. Still, it is noted that other determinants have a much stronger impact on risk-taking.

Table 3 | Multiple linear regression results

	Unstandardized error		Standardized coefficients			Collinearity statistics	
	B	Std. error	Beta	t	Sig	Tolerance	VIF
(Constant)	7.895	1.005		7.853	0		
LCAGE	-1.326	0.595	-0.103	-2.23	0.026	0.781	1.28
LCTENURE	-0.057	0.092	-0.29	-0.621	0.535	0.781	1.28
CGEN	-0.162	0.208	-0.032	-0.778	0.437	0.998	1.002

	R	R-squared	Adjusted R-squared	Sig
Model	0.122	0.015	0.01	0.031

Source: authors (from SPSS table)

5.3.1 CEO age

There is strong evidence that CEO age has a negative and significant effect on risk-taking ($\beta = -1.326$, $p < 0.05$) (Table 3). Older CEOs are more reluctant to take risks, while a 1.326 unit decrease in risk-taking is predicted for every unit increase in CEO age. $H1_0$ is rejected.

The finding is in line with theoretical expectations and mainstream studies that have found a negative association between CEO age and risk-taking (Croci et al., 2016; Andreou et al., 2017; Chowdhury & Fink, 2017; Li et al., 2017; Yeoh & Hooy, 2020; Kaur & Singh, 2020; Elia et al., 2021). However, it contradicts other literature that has found a positive relationship (Phua et al., 2018; Li et al., 2021) or an insignificant relationship (Kish-Gephart & Campbell, 2015; Lee & Moon, 2016). The finding supports the arguments in previous literature which have claimed that older CEOs have decreased flexibility and increased desire to protect their career stability and economic security rather than organizational change (Kaur & Singh, 2020). They do not want to disrupt their established spending patterns, community circles and expectations about retirement earnings. Other than that, Croci et al. (2016) identified that older CEOs have established larger firm-specific wealth and human capital that are undiversified. Since deterioration in firm performance is normally attributed to CEOs' incompetence (Eckbo & Thorburn, 2003), this adversely affects their benefits at cash-out and also poses considerable threats to the CEOs' reputations that have been built throughout their career (Matta, 2004). Furthermore, older CEOs who have shorter career horizons need to personally bear the negative impact of risky investments on current profitability without

benefiting from the investment payoffs that would likely take place in the long run (Garcia-Blandon, et al., 2019). Therefore, they tend to forgo risky choices to avoid losing their financial status and tainting their legacies in the last years of employment. This is supported by Chaganti et al. (2016), who posited that older TMT who may be heavy on human and social capital are more apt to manage initial public offerings more slowly. On the other hand, younger CEOs are typically related to characteristics such as creativity, ability to absorb new ideas and intuition (Mudambi & Treichel, 2005). It is also obvious that CEOs who have successfully led their firms are better valued by the market and are provided higher employment offers in other firms. Hence, younger CEOs who have longer career horizons are more motivated to signal their superior ability to the market and consolidate their status through entrepreneurial venturing, which is consistent with the managerial signalling model (Yeoh & Hooy, 2020).

5.3.2 CEO tenure

In Table 3, the p-value for the CEO tenure coefficient is higher than the 0.05 level ($\beta = -0.057$, $p > 0.05$), suggesting that there is an insignificant effect of CEO tenure on risk-taking. This is consistent with the correlation results. These results imply that CEO tenure is not an effective measure of risk-taking. $H2_0$ failed to be rejected.

This result contradicts UET. Most scholars have found a negative and significant connection between CEO tenure and risk-taking (Lee & Moon, 2016; Barkema & Chvyrkov, 2017; Hsu et al., 2020; Loukil & Yousfi, 2022). Nonetheless, this finding remains consistent with that of Amador and Gustavsson (2020), who documented an insignificant effect of CEO tenure on risk-taking measured by performance variability in a sample of 100 Scandinavian family manufacturing firms during 2014-2017. Yunlu and Murphy (2012) also affirmed that tenure has an insignificant influence on risk-taking expressed as R&D. This concludes that CEOs' understanding of the strategic situations they confront is not shaped by their tenure, and therefore their risk preferences do not appear to change over their tenure. The reason that the null hypothesis cannot be rejected could be the model's low R-squared value of 1.5%. The effect of CEO tenure on risk-taking may be smaller than expected, possibly even close to zero, and therefore may be regarded as negligible or absent. This study's sample is also relatively small (100 firms) and covers a shorter timeframe (6 years), thereby diminishing the probability of detecting the impact of CEO tenure on risk-taking. Most of the previous research that has found a significant relationship between these two variables had over 100 samples (Chen & Zheng, 2012; Hsu et al., 2020; Loukil & Yousfi, 2022) and timeframes of over 10 years (Barkema & Chvyrkov, 2017). These studies also used different measurements of risk-taking, such as standard deviation of daily stock returns (Chen & Zheng, 2012), R&D (Hsu et al., 2020), innovation (Loukil & Yousfi, 2022) and entrepreneurial orientation (Boling et al., 2015), which can explain the non-significant relationship found in this paper. Although the relationship is insignificant, the negative value of the beta coefficient may suggest that long-tenured CEOs are more likely to avoid risk-taking. This could be explained by the argument that longer tenure causes CEOs to rely on routines for information gathering and processing; therefore, they are more resistant to considering other points of view (Luo et al., 2013). Long tenure also allows CEOs to have more power and time to handpick subordinates of their choosing, which increases their autonomy and minimizes the pressure received from other constituencies (Wang et al., 2016). Consequently, they are less willing to initiate risky investments as tenure progresses.

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5.3.3 CEO gender

According to Table 3, CEO gender negatively affects risk-taking, but not at a significant level ($\beta = -0.162$, $p > 0.05$). This implies that CEO gender is not closely related to risk-taking, which is consistent with the correlation result. $H3_0$ failed to be rejected.

This finding does not support UET, but it confirms many studies that have documented no significant association between CEO gender and risk-taking (Sila et al., 2016; Na & Shin, 2019; Kaur & Singh, 2020). This means that gender plays no role as a determinant of risk-taking, which is inconsistent with social and constructionist feminist theories but corroborates the liberal feminist theory. The liberal feminist theory argues that men and women are the same; therefore, similar innovative propensities are expected from CEOs of any gender with similar characteristics and resources (Expósito et al., 2021). This insignificant result could be due to 97% of the sample being made up of male CEOs, while female CEOs only account for a very small percentage. Accordingly, the inherent risk capabilities of female CEOs may not be showcased and captured by the model. Aside from that, no consensus has yet been reached concerning whether women are more risk-averse than men. Some studies have found male CEOs to be significantly more prone to take higher risks (Martín-Ugedo & Minguez-Vera, 2014; Faccio et al., 2016; Faisal, 2020; Expósito et al., 2021), while some have found the opposite (Berger et al., 2014; Mukarram et al., 2018). While the result is insignificant, the negative value of the beta coefficient illustrates that female CEOs are less willing to seek risk. This could be because of the lower self-confidence level possessed by female CEOs relating to decisions in managing business and innovation (Taylor & Hood, 2011; Lim & Envick, 2013; Zalata et al., 2019). Women are afraid to be perceived adversely if they behave aggressively, and they are usually asked to tone down their interpersonal behaviour (Rudman et al., 2012). In contrast, men are more prone to overestimate their abilities and overly optimistic about profits in risky projects and thus investing more in them (Herbst, 2020). Male CEOs also tend to focus on running profitable businesses by taking more risks, unlike female CEOs, who relate business relationships to family, societal and personal factors and emphasize harmony (Krishnan & Park, 2005).

5.4 Moderation analysis

For moderation analysis, it is better to mean-centre the moderators to facilitate the interpretation of the regression parameters and to alleviate high multicollinearity problems with the interaction term (Hayes, 2018). Interaction terms are created by multiplying each of the independent variables with moderators. To this end, +1, 0, and -1 standard deviations (SD) on the centred moderators are used to make comparisons across the high, moderate and low levels of moderators. Margin plots are showcased to visualize the interaction effect, in which the blue, red and green lines indicate the moderators that are one SD below the mean, at the mean and one SD above the mean, respectively.

5.4.1 Moderating effect of audit committee ownership

Table 4 shows the results of the moderation analysis for AC ownership. To examine H4, the variable of interest is the interaction term LCAGE*LACO. The interaction term is statistically positive ($\beta = 0.4014$, $p < 0.05$). After entering the interaction term into the model, there was a moderate yet significant increase of 0.67% in model fit for regression equations that predict risk-taking ($\Delta R^2 = 0.0067$). At low and moderate AC ownership levels, the impact of CEO age

on risk-taking is negative and significant ($\beta = -2.7262$, $p < 0.01$; $\beta = -1.6501$, $p < 0.01$). Conversely, at a high AC ownership level, the effect is negative and insignificant ($\beta = -0.5740$, $p > 0.05$). Figure 2 shows that the connection between CEO age and risk-taking is more strongly negative at a low AC ownership level and less strongly negative at a high AC ownership level. $H4_0$ is rejected.

The interaction term LCTENURE*LACO is positive and significant at the 10% level ($\beta = 0.0581$, $p < 0.10$), providing weak evidence for rejecting $H5_0$. The R-squared change after adding the interaction term is 0.0058, suggesting that the interaction effect accounts for 0.58% added variation in risk-taking. The negative effect of CEO tenure on risk-taking is significant at a low AC ownership level ($\beta = -0.2799$, $p < 0.05$). However, this relationship is positive but insignificant at a high AC ownership level ($\beta = 0.0314$, $p > 0.05$). Figure 3 reveals that longer-tenured CEOs promote the least risk-taking when AC ownership is low.

To test H6, the interaction term CGEN*LACO is used. The coefficient is positive and significant ($\beta = 0.2877$, $p < 0.01$). It accounts for a significant 1.58% increase in the variances in risk-taking ($\Delta R2 = 0.0158$). The association between CEO gender and risk-taking is significantly negative at a low AC ownership level ($\beta = -1.0069$, $p < 0.01$), but it becomes insignificant at a moderate AC ownership level ($\beta = -0.2358$, $p > 0.05$). The association becomes insignificantly positive at a high AC ownership level ($\beta = 0.5354$, $p > 0.05$). Figure 4 demonstrates that female CEOs significantly commit to riskier strategies in firms with high AC ownership levels, as compared to male CEOs. $H6_0$ is rejected.

Overall, the effects of CEO age, tenure and gender are contingent on AC ownership. AC ownership positively moderates the negative connection between CEO age, tenure, gender and risk-taking. In other words, even if older, longer-tenured and female CEOs are more inclined to invest in less risky projects; it does not have as strong an effect in firms with a high level of AC ownership as in low-level ones. While CEO tenure appears to have a negative but insignificant effect on risk-taking in multiple regression analysis, adding AC ownership as a moderator to the model makes the relationship become significant at a low AC ownership level. This implies that CEO tenure may be a more important instrument for risk-taking when AC ownership is low.

The positive effect of AC ownership could be explained by the “entrenchment” view. When stockholdings are high, AC independence is threatened, and they may not be fulfilling their oversight role in controlling managerial risk-taking behaviour effectively (Keune & Johnstone, 2015). This is because stockholdings tie ACs’ wealth to the company’s short-term and long-term financial performance, which encourages ACs to inflate their investment as equity stakes increase (Sharma & Kuang, 2014; Bhuiyan & D’Costa, 2020). This leads to a conflict of interest in a manner that ACs are reluctant to challenge managers’ risk-taking activities when necessary (Saeed & Riaz, 2021). This result agrees with previous studies that have revealed that companies with greater AC stockholdings are linked to ineffective monitoring, including exhibiting higher earnings management (Yang & Krishnan, 2005), greater audit report lag (Bhuiyan & D’Costa, 2020) and lower likelihood of an auditor issuing a going-concern report (Saeed et al., 2022). However, the finding is inconsistent with other research that has established an “incentive alignment” view (MacGregor, 2012; Habib et al., 2020; Ojeka et al., 2021). They have argued that shareholdings align ACs’ interests with those of shareholders, which in turn motivates them to protect shareholders’ interests by questioning management about inappropriate risky decisions. Nevertheless, the overall findings

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contribute to the prior research by providing empirical evidence that stockholding is a significant measure for assessing AC independence (Bolton, 2012; Church et al., 2018; Salehi, 2020).

5.4.2 Moderating effect of audit committee ethnicity

Table 5 shows the results of the moderation analysis for AC ethnicity. To test H7, the interaction term LCAGE*ACE has a positive but insignificant coefficient ($\beta = 1.8086$, $p > 0.05$). This reveals that AC ethnicity is not a statistically significant moderator of the association between CEO age and risk-taking. $H7_0$ failed to be rejected.

Next, the interaction term LCTENURE*ACE is positive but insignificant ($\beta = 0.0453$, $p > 0.05$). It infers that AC ethnicity does not significantly moderate the association between CEO tenure and risk-taking. $H8_0$ is not rejected.

Lastly, H9 is tested using the interaction term CGEN*ACE. It has a significant negative coefficient ($\beta = -4.3385$, $p < 0.01$). When adding the interaction terms to the model, the explained variation in risk-taking increases by 2.31% ($\Delta R2 = 0.0231$). At low proportions of Malay ACs, the association between CEO gender and risk-taking is significantly positive ($\beta = 0.7693$, $p < 0.05$). At moderate and high percentages of Malay ACs, the association becomes significantly negative ($\beta = -0.5235$, $p < 0.05$; $\beta = -1.8163$, $p < 0.15$). Figure 5 shows that female CEOs engage in fewer risky activities when the proportion of Malay ACs is high, as compared to a low proportion. $H9_0$ is rejected.

Overall, AC ethnicity does not moderate the association between CEO age, tenure and risk-taking. As per the authors' knowledge, the moderating role of AC ethnicity on this relationship has not been investigated by prior studies. Therefore, it may be possible that AC ethnicity has nothing to do with the link between these variables. Other proxies may affect this relationship, which further studies are necessary to verify. These insignificant findings are consistent with previous studies that have found no evidence that ethnicity can explain managerial behaviours in terms of BOD effectiveness (Hamid, 2018), earnings management (Wan Mohammad & Wasiuzzaman, 2020), accounting conservatism (Yunos et al., 2012) and audit fees (Johl et al., 2012). In literature, there are two conflicting views. On the one hand, they corroborate the arguments that Malays are less risk-seeking (Hamzah et al., 2002; Rahman et al., 2015; Marzuki, 2022), as they prefer relationship building and stability due to Islam traditions (Ramasamy et al., 2007). On the other hand, some scholars have argued that Malays engage in riskier investments because of the introduction of the NEP, which promotes inefficient corporate governance practice (Wan Mohammad & Wasiuzzaman, 2020) and the increased individualism of Malays as a result of globalization (Haniffa & Cooke, 2002). Therefore, another possible explanation for the insignificant result is that the Malays' preference for stability and the increased individualism may be cancelling themselves out.

It is documented that AC ethnicity negatively moderates the association between CEO gender and risk-taking. As CEO gender does not significantly affect risk-taking in multiple regression analysis, this significant moderating effect may indicate that CEO gender is more important in influencing risk-taking when it is related to Malay ACs. The result outlines that when there is a high percentage of Malay ACs, female CEOs take fewer risks than when there is a low percentage. One possible explanation is that Malays are inclined to social harmony and relationship building. Hamzah et al. (2002) demonstrated that Malays prefer a participant leadership style that tends to subject decisions to the overall interest of

stakeholders. Hence, Malays are more associated with femininity, which represents a preference for quality of life, relationships, modesty and caring for the weak, instead of competition (Hofstede, 1983). It was also revealed by Haniffa and Cooke (2002) that Malay-dominated boards positively affect corporate social disclosure practices, partly because of the Malays' feminine cultural values. Consequently, in a firm where there is a female CEO and a higher percentage of Malay ACs, Malays' femininity values strengthen the tendency for female CEO to avoid risk. This is supported by Meier-Pesti and Penz (2008), who demonstrated that masculinity better predicts financial risk-taking than gender. They also documented that masculinity positively affects risk-taking. Nevertheless, AC ethnicity does not seem to be a significant overall moderator between CEO characteristics and risk-taking.

Table 4 | Moderation analysis results – AC ownership

	Int_1 [LCAGE*LACO]	Int_2 [LCTENURE*LACO]	Int_3 [CGEN*LACO]
coeff	0.4	0.058	0.288
p-value	0.04	0.063	0.002
R^2-chng	0.01	0.006	0.016

LACO		Int_1 [LCAGE*LACO]	Int_2 [LCTENURE*LACO]	Int_3 [CGEN*LACO]
-2.68	Effect	-2.726	-0.28	-1.007
	p-value	6E-04	0.0129	0.0042
0	Effect	-1.65	-0.124	-0.236
	p-value	0.002	0.1372	0.2634
2.681	Effect	-0.574	0.0314	0.5354
	p-value	0.422	0.7997	0.0745

Source: authors (from SPSS table)

Table 5 | Moderation analysis results - AC ethnicity

		Int_4 [LCAGE*ACE]	Int_5 [LCTENURE*ACE]	Int_6 [CGEN*ACE]
	coeff	1.8086	0.0453	-4.3385
	p-value	0.276	0.8676	0.0001
	R2-chng	0.0019	0	0.0231
ACE				
-0.298	Effect			0.7693
	p-value			0.0108
0	Effect			-0.5235
	p-value			0.0263
0.298	Effect			-1.8163
	p-value			0.0003

Source: authors (from SPSS table)

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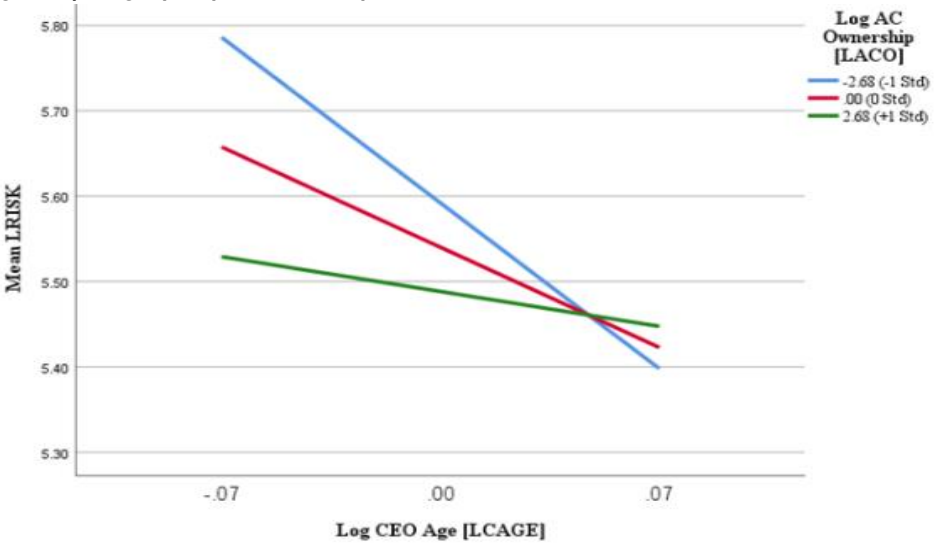
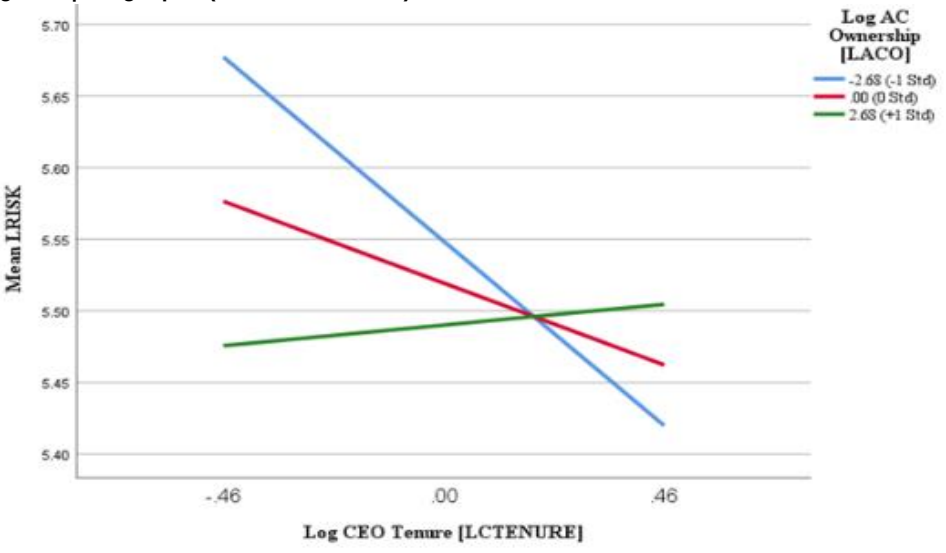
Figure 2 | Margin plot (LCAGE*LACO)



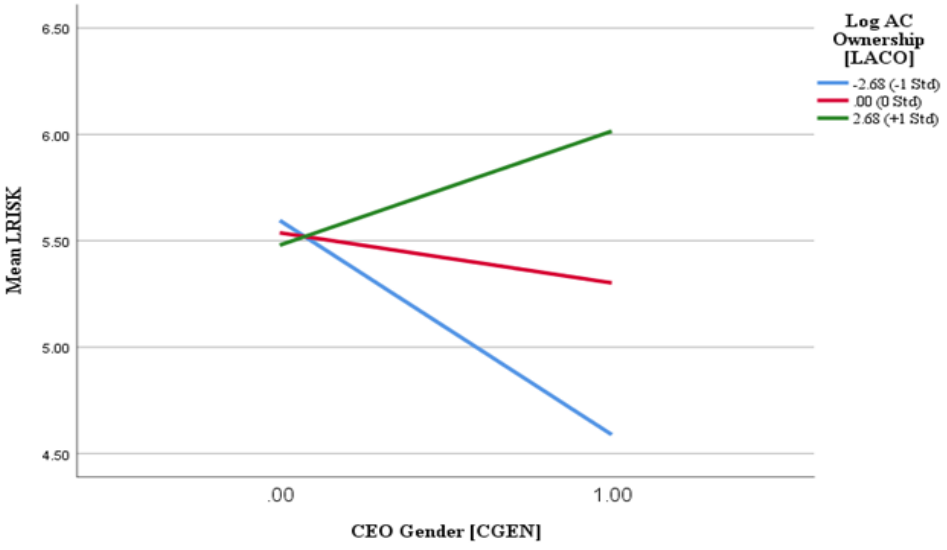
Source: authors

Figure 3 | Margin plot (LCTENURE*LACO)



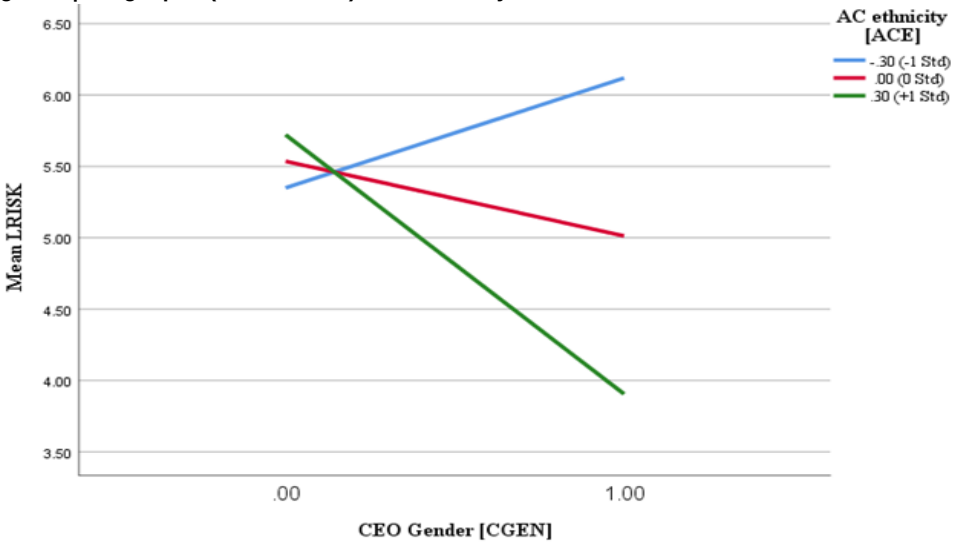
Source: authors

Figure 4 | Margin plot (CGEN*LACO) – AC ownership



Source: authors

Figure 5 | Margin plot (CGEN*LACO) – AC ethnicity



Source: authors

Conclusion

Motivated by the notion that risk-taking is a complex topic, this paper aimed to comprehend how CEO characteristics such as age, tenure and gender affect their managerial risk-taking behaviour and how this relationship is moderated by AC ownership and ethnicity. Data from the annual reports of the top 100 Malaysian PLCs were collected, which consist of 600 firm-year observations during the period 2015-2020. The data were processed using SPSS through Pearson's correlation, multiple regression analysis and Hayes' process for moderation analysis.

One of the study's main contributions is to add to the literature that employs UET in predicting firm behaviours using CEO characteristics. This is important as the effect of CEO characteristics on risk-taking still lacks consensus, especially on small emerging markets such as Malaysia. Specifically, this study provides empirical evidence that older CEOs are more risk-averse because they are more inclined to protect their career stability and economic security rather than organizational change (Kaur & Singh, 2020). The results, however, do not support the use of CEO tenure and gender as proxies for risk-taking decisions, indicating that tenure and gender may not effectively capture the complex behavioural and psychological effect of risk-taking. Nonetheless, negative values of beta coefficients imply that long-serving and female CEOs tend to avoid risk. In short, the models determine that only CEO age statistically affects risk-taking, showing certain external validity of the UET in the Malaysian top PLC context. Top managers' demography traits, such as tenure and gender may not necessarily affect their decision-making; thus, the upper echelon predictions are not entirely supported. There may be other factors that could affect the CEOs' risk-taking behaviours.

This paper also answers the call for prior research to shed more light on ACs' role (Martinov-Bennie et al., 2015; Compernolle, 2018; Khemakhem & Fontaine, 2019) instead of emphasizing BOD only. We document that AC ownership positively moderates effects of CEO age, tenure and gender on risk-taking. A high AC ownership level restrains older, long-serving and female CEOs to be risk-averse. This is consistent with the "entrenchment" view, as shareholdings compromise AC independence to govern managerial risk-taking decisions. In contrast, the overall results fail to support the moderating role of AC ethnicity on the connection between CEO characteristics and risk-taking. AC ethnicity negatively moderates the association between CEO gender and risk-taking, but it does not significantly moderate the connection between CEO age, tenure and risk-taking. A high percentage of Malay Acs, who are usually linked to higher femininity, strengthens the propensity of female CEOs to avoid risks. These findings contribute to the literature as the moderating role of AC ownership and ethnicity has not been investigated before.

The results raise important implications for practitioners interested in firm risk-taking. This work enriches the accepted notion that older CEOs are more risk-averse, thus offering guidelines to shareholders and BOD in assigning suitable CEOs according to their companies' objectives in exploiting risky opportunities. Investors can also match their risk preferences by considering the CEO's age when selecting their securities portfolios. If they are oriented towards seeking more risks to capture more business opportunities, a younger CEO would benefit their direction. Contrarily, an older CEO is more appropriate if they are pursuing stability. Also, the findings provide useful insights for the management to better

predict their competitors' risk propensities. Firms with a younger CEO may be sending a signal regarding the firms' potential risk-taking, thereby facilitating management to develop suitable counter-strategies to maintain firm competitiveness. As CEO tenure and gender do not significantly affect risk-taking, the interested parties may not need to consider these traits when making decisions.

To date, the MCCG only highlights certain AC attributes, such as meeting frequency, size and independence status, for their impact on effectiveness, without focusing on the ownership construct. Academic evidence reflecting how equity-based compensations compromise AC independence is still inconclusive. Our paper contributes to this debate by providing evidence that AC ownership threatens independence, leading to ineffective corporate governance and higher risk-taking. The importance of ACs' substantive independence rather than procedural independence is highlighted. Malaysian regulators may consider amending and enforcing AC guidelines to control ACs' stockholdings and their close relatives serving on boards. Moreover, the findings aid board governance committees to consider ACs' ethnicity during nomination. If a female CEO is appointed, fewer Malay ACs may need to be nominated to counter the female CEO's excessive risk-averse attitudes and enhance firm values. Overall, this paper deepens the relevant parties' understanding about risk-taking and offers them useful guidance to make corporate governance decisions.

This paper is not without limitations. Firstly, the sample is limited to top PLCs in Malaysia and only covers a single 6-year period. The findings may not hold for smaller firms and different countries because there is a multitude of contingencies embedded in different firm sizes and regulatory markets that can restrict CEOs' behaviours and strategic alternatives available to them. Future research can extend the model to smaller private firms and across different countries to improve the generalizability of the results. A sample extending over a longer period can also provide more insights. Secondly, this study's sample is heavily male-skewed, as female CEOs are poorly represented in Malaysian top PLCs. Consequently, the findings may not hold for female CEOs. Future research may explicitly incorporate more female CEOs in the sample to iron out potential boundary conditions to the findings. Thirdly, this study's emphasis is placed on individual CEOs because there is very little consistency regarding the disclosure of the other TMT profiles by Malaysian PLCs. Nonetheless, upper-echelon theorists have suggested that TMT characteristics may yield stronger predictions of strategic behaviours. This represents an appropriate subject for future research. Lastly, this study only uses a quantitative approach by collecting data from annual reports. The real motive behind CEOs' and ACs' risk-taking behaviour could not be captured. Future studies may employ a qualitative analysis by conducting interviews with CEOs and ACs to obtain more information about their attitudes and risk preferences.

Notwithstanding the above limitations, this research contributes to a better appreciation of the need to consider the effect of CEO and AC attributes on risk-taking. It is hoped that this paper will stimulate further work, especially on the moderating role of other AC attributes.

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***Editor's note**: The following table cannot be edited since authors have not delivered the original table.*

Appendices

Appendix A: Sample

ID	Company Name
1	Petronas Chemical Group Berhad
2	IHH Healthcare Berhad
3	Press Metal Aluminium Holdings Berhad
4	MISC Berhad
5	Nestle (Malaysia) Berhad
6	Axiata Group Berhad
7	Maxis Berhad
8	Kuala Lumpur Kepong Berhad
9	IOI Corporation Berhad
10	DIGI.com Berhad
11	Telekom Malaysia berhad
12	Genting berhad
13	Sime Darby berhad
14	Hartalega Holding berhad
15	QL Resources berhad
16	Westports Holding berhad
17	Malaysia Airports Holdings berhad
18	Batu Kawan berhad
19	Inari Amertron berhad
20	Top Glove Corporation berhad
21	Gamuda Berhad
22	Sunway Berhad
23	Time Dotcom Berhad
24	Heineken Malaysia Berhad
25	Vitrox Corporation Berhad
26	Fraser & Neave holdings Berhad
27	Carlsberg Brewery Malaysia Berhad
28	MY E.G. Services Berhad
29	Genting Plantations Berhad
30	Malaysian Pacific Industries Berhad
31	D&O Green Technologies Berhad
32	IJM Corporation Berhad
33	FGV Holdings Berhad
34	United Plantations Berhad
35	Scientex Berhad
36	IOI Properties Group Berhad
37	Astro Malaysia Holdings Berhad
38	Oriental Holdings Berhad
39	Unisem (M) Berhad
40	Frontken Corporation Berhad
41	UOA Development Bhd
42	Kossan Rubber Industries Berhad
43	V.S. Industry Berhad
44	KPJ Healthcare Berhad
45	UMW Holdings Berhad
46	PMB Technology Berhad
47	British American Tobacco (Malaysia) Berhad
48	SP Setia Berhad
49	Sarawak Oil Palms Berhad
50	Dagang Nexchange Berhad
51	Hong Leong Industries Berhad
52	Pentamaster Corporation Berhad
53	Supermax Corporation Berhad
54	Guan Chong Berhad
55	Capital A Berhad
56	Sports Toto Berhad
57	Bintulu Port Holdings Berhad
58	SKP Resources Bhd
59	Boustead Plantation Berhad
60	DRB-Hicom Berhad
61	Padini Holdings Berhad
62	SAM Engineering & Equipment (M) Berhad
63	Far East Holdings Berhad
64	Ta Ann Holdings Berhad
65	Hap Seng Plantation Holdings Berhad
66	Eco World Development Group Berhad
67	Hextar Global Berhad
68	Dutch Lady Milk Industries Berhad
69	Aeon Co. (M) Bhd
70	Matrix Concepts Holdings Berhad
71	Bermaz Auto Berhad
72	Hengyuan Refining Company Berhad
73	Taliworks Corporation Berhad
74	OSK Holdings Berhad
75	Kim Loong resources Berhad
76	YNH Property Berhad
77	TSH Resources Berhad
78	UEM Sunrise Berhad
79	Malaysian Resources Corporation Berhad
80	GHL Systems Berhad
81	Berjaya Food Berhad
82	Panasonic Manufacturing Malaysia Berhad
83	Tropicana Corporation Berhad
84	Datasonic Group Berhad
85	Genetec Technology Berhad
86	Boustead Holdings Berhad
87	7-eleven Malaysia Holdings Berhad
88	Mah Sing Group Berhad
89	Malaysia Smelting Corporation Berhad
90	Shangri-La Hotels (Malaysia) Berhad
91	Dufu Technology Corp Berhad
92	Keck Seng (Malaysia) Berhad
93	Uchi Technologies Berhad
94	Apex Healthcare Berhad
95	Kretam Holdings Berhad
96	P.I.E. industrial Berhad
97	Mbm resources Bhd
98	UEM Edgenta Berhad
99	Cahya Mata Sarawak Berhad
100	United Malacca Berhad

Source: authors