

Navigating CEO Characteristics, Strategic Choices, and Firm Success

Abstract

This study examines the relationship between the CEOs' demographic characteristics (age, tenure, and professional qualifications) and the firm's approach to developing business strategies (prospector vs. defender). Using evidence from a sample of 4,826 Australian firm-year observations, the findings suggest that CEO age and tenure are negatively associated with the prospector business strategy while CEO education is positively associated with the prospector business strategy. Further analysis suggests that CEO age has a negative effect on firm performance. This finding suggests that corporate governance and policymakers in Australia could consider introducing CEO Mandatory Retirement Policies (MRPs). Furthermore, the results are robust based on firm-fixed effects, propensity score matching and lagged CEO demographic characteristics.

Keywords: CEO characteristics, Business strategy, Firm performance, Australian market

Introduction

The relationship between Chief Executive Officer (CEO) characteristics and firms' strategic choice (innovation activities) has received limited attention in prior studies, particularly in diverse jurisdictional contexts (Shen, 2022). This study examines the association between the CEO characteristics and the choice of a firm's business strategy and the implications of this relationship on firm performance. Research using Upper Echelon Theory links managerial characteristics including age, experience, power, tenure and education with strategic choices and firm outcomes (Hambrick and Mason, 1984). Related research shows that the characteristics linked to age such as CEO experience and quality (measured as ratio of CEO tenure to age), have an influence on management decision-making and firm performance (Davidson et al., 2007, Bhagat and Bolton, 2008). The evidence suggests that CEOs' or top management's characteristics, highly affect their strategic decisions, which, in turn, influences firm outcomes (Hambrick and Mason, 1984; Herrmann and Datta, 2006; Datta and Rajagopalan, 1998). While there is a rich literature in this area of research, there is no specific empirical agreement on whether particular CEO characteristics (age, tenure, education) have an impact on a firm's strategic direction and a subsequent impact on firm performance. Particularly, there is relatively sparse literature on CEO characteristics within the Australian context where there is no mandatory retirement policy.

CEOs play an important leadership role in firms by leading the top management team (TMT) and by making important strategic decisions becoming a driver of innovation and strategic thinking (Andrews, 1987). Both the CEO and the TMT are noted for their involvement in developing business strategies (Miller and Toulouse, 1986). Importantly, firm performance has been linked to members of the TMT (Hambrick and Mason, 1984; Norburn and Birley, 1988). Research evidence suggests that the demographic characteristics of top managers (i.e., nationality, hierarchical decentralisation, and politicisation) influence firms' strategic decision-making processes (Papadakis, 2005). Further evidence suggests that the personality traits of top managers and expertise influence the way of top managers process information and the way they make decisions (Erjavec et al., 2019; Zhu and Chen, 2015). Arendt et al. (2005) demonstrate how CEOs gather and process information, develop a business strategy, and then implement the strategy throughout the firm. However, it is not clear how CEOs choose different strategic positions that ultimately impact on firm's performance. In this study, we examine the CEO's decisions on strategic positioning based on a sample of Australian companies through an analysis of demographic characteristics.

Prior studies examine different strategic choices as the mediating mechanism in the relationship between CEOs and firm performance. For example, Herrmann and Datta (2006) examine strategic decision-making relating to investments, joint ventures and acquisitions and find that less experienced CEOs and CEOs with international experience, prefer acquisitions and investments whereas older CEOs were more likely to opt for joint ventures. Waldman et al. (2006) link strategic decisions on corporate social responsibility with CEO leadership style. We extend this literature by categorising strategic choices as either the ‘innovation-oriented prospector’ or the ‘efficiency-oriented defender’, based on a model developed by Miles and Snow (1978).¹ A business strategy influences the business model and operating environment (Rajagopalan, 1997, Navissi et al., 2017), thereby influencing how firms structure their processes to achieve a superior performance (Miles and Snow, 1978). This evidence is consistent with the notion that managers become more ethical and conservative in their strategic choices as they become older (Sundaram Yermack, 2007). Based on this proposition, we argue that CEO age is positively related with conservatism and the inclination to adopt defender investment strategies. Prior research investigating the merits of CEO Mandatory Retirement Policies (MRP), report a negative association between age and firm value, when firms do not implement a policy the MRP (Jagannathan and Loon, 2011, Cline and Yore, 2016). However, no study examines whether CEO age has an impact on strategic choice in a setting like Australia where MRP is voluntary. The aim of this study is to examine the association between CEO age and the adoption of different strategies among a sample of Australian companies where there are no mandatory retirement policies (MRPs).

The motivation for our study stems from three main sources. Firstly, several studies investigate the impact of CEO age on performance outcomes, audit fees and financial reporting quality (Serfling, 2014, Harjoto et al., 2015, Huang et al., 2012, Shen et al., 2022). Peng (2003) similarly posits that firms capable of achieving a strategic fit with the institutional environment are likely to attain a higher performance outcome. Whilst prior studies highlight the importance of strategic choice on firm performance, Shen (2022) calls for more research investigating how broader CEO characteristics affect strategic choices and firm performance (p. 376). This study is located in the Australian setting, where there is a dearth of this research on this topic. The

¹ Following prior studies, we consider the polar opposite business strategies proposed by Miles and Snow (1978): prospector and defender. These two strategies embody some features of the other two business strategies in Miles and Snow (1978); namely, the ‘Analyser’ which has prospector and defender features, and the ‘Reactor’ which features strategic inertia and uncertain outcomes. The Miles and Snow (1978) typology takes a more wholistic view of operations and financing.

second motivation draws from prior research in accounting and other disciplines particularly the discipline of psychology in which age and other CEO characteristics have a significant influence on managerial leadership styles and behaviour. Evidence from the UK finds that older managers consult more widely and favour more participatory management by achieving consensus in decision-making with their subordinates or by helping others to achieve their objectives (Oshagbemi, 2004). Cline and Yore (2016) argue that many CEOs have invested their work-lives in the firm and play a key role in developing considerable firm-specific human capital. Therefore, we believe that age influences the choice of the strategic position.

The third motivation stems from the governance setting of Australia, permitting an examination of voluntary MRPs. Cline and Yore (2016) investigates the merits of CEO MRPs using the universe of firms listed in Standard and Poor's EXECUCOMP data for the period from 1993 to 2005. The study concludes that mandatory CEO retirement at a specified age, mitigates the underperformance of older CEOs. However, there are two competing arguments underpinning the rationale for MRPs. First, firm-specific human capital assumes that as CEOs increase in age, their managerial ability to enhance shareholder value also increases. This view suggests that age and experience are important attributes in enhancing financial performance. Older CEOs develop vast amounts of firm specific human capital and invest energy in their firms accordingly (Cline and Yore, 2016). Skirbekk (2004) provides evidence that older employees are highly productive in occupations where experience counts for improved performance. This body of evidence suggests that the older CEOs are less likely to engage in prospector business strategies. The opposing argument draws on the notion of CEO entrenchment in where shareholders see an aging CEOs as no longer capable to maximise shareholder wealth. Sachaie (1996) proposes that inductive reasoning, perpetual speed, numeric ability and verbal memory, decline with age at an accelerating rate beyond the age of 60. MRPs will cap the age at which CEOs may retain their position and ensure entrenchment is avoided. However, in Australia there are no such MRPs in place, the decision to retire may occur voluntarily or from regulatory changes encouraging individuals to access their superannuation or pension plan more readily without penalty. The results of this study will provide a comparative analysis of research evidence collected from jurisdictions where MRPs are mandatory.

Also, there are many other reasons why Australian firms offer a unique context compared to global markets. First, Australia has a well-established corporate governance system guided by the ASX Corporate Governance Principles and Recommendations. The governance environment emphasizes CEO accountability and strategic decision-making, providing an ideal

setting to study the impact of CEO demographics on business strategies. Unlike other jurisdictions, Australia does not have a strict mandatory retirement age for CEOs. This allows researchers to examine the natural effects of CEO age and tenure on firm strategy and performance, without external policy constraints. In addition, the Australian market is characterized by a mix of resource-based industries, financial services, and technology-driven firms. This diversity provides a broad spectrum of business strategies (prospector vs. defender), making it easier to observe how CEO characteristics influence strategic choices. Further, Australia has a stable regulatory environment with high transparency and investor protection. The interplay between regulatory oversight and CEO decision-making provides deeper insights into how demographic factors shape corporate strategy. Finally, compared to the U.S. or European markets, Australian firms operate in a different cultural and economic setting, where risk appetite, innovation, and governance practices may differ. This makes it a compelling case for examining how CEO characteristics influence strategic decisions. These factors collectively make Australia a distinctive setting to study the relationship between CEO demographics and business strategy, offering insights that may not be directly transferable to other global markets.

The hypothesis in this study addresses three key CEO characteristics (age, tenure, education) and how they influence. The research on risk-taking behaviour and age is mixed. One stream of thought suggests that younger managers are more risk-averse in choosing investments to protect their reputation and career (Holmstrom, 1999; Hirshleifer and Thakor, 1992 and Scharfstein and Stein, 1990). An alternative stream of literature claims that young managers are more aggressive in their investment strategy to signal the market that they are competent managers (Prendergast and Stole, 1996; Farang and Mallin, 2018). In contrast, older managers are more concerned with investing less on R&D and maintaining a conservative investment strategy (e.g. Serfling (2014). Research on CEO tenure suggest that long-tenured CEOs commit to their business strategy and focus on low-risk projects to avoid shareholder pressure. As tenure increases, CEOs refrain from investing in innovative new ideas and focus on stability and efficiency (Li and Tan, 2013). Furthermore, when CEOs are less adaptable to changes, firm value declines (Brochet et al. 2021). Research on CEO and education is mixed but the weight of evidence suggests that highly educated CEOs are more open to new ideas and changes in investments are less risk-averse (e.g. Barker and Mueller, 2002; Farag and Mallin, 2018; Lin et al. 2011).

The present study evaluates the impact of CEO demographic characteristics including age, tenure, and professional qualification, on the firm's strategic position (prospector vs defender

strategy) using a sample of 4,681 firm-year observations from 2004 to 2018. In measuring business strategy, we adopt a discrete STRATEGY composite measure as a proxy for the firm's business strategy (Bentley et al., 2013, Higgins et al., 2015). Our results suggest that age and tenure are negatively associated with the adoption of prospector strategy, in turn, negatively impacting on firm performance. We argue that older CEOs are more likely to adopt the more efficient defender strategy, instead of the innovative prospector strategy. Zhang (2016) finds that when market concentration increases, the performance advantage of defender strategies declines, suggesting a moderating role of product market competition in the strategy-performance link. If the firms are unable to adjust their strategy to the change in market conditions, they may fail to gain a competitive advantage and lose market share. The evidence raises issues for policy makers of corporate governance in Australia to consider introducing MRPs for CEOs.

This study has both theoretical and practical contributions. Our findings extend the stream of research on CEO characteristics, by examining the impact of CEO characteristics on firm performance through the mediating variable of strategy, categorised as either prospective or defender strategy. The preponderance of prior studies focuses on the CEO or executives from the perspective of only one characteristic such as gender or age. The present study uses three CEO demographic characteristics: age, tenure, and qualification. Our findings suggest there is a negative relationship between the adoption of prospector strategy and CEO age and tenure. Our findings are consistent with prior research in which the ability to maximise shareholder wealth declines with age. In terms of practical contributions, the evidence indicates that CEO age and MRPs have a significant impact on firm performance and should be considered as a factor contributing to policy development on corporate governance. This study provides insight to corporate governance policymakers in Australia on whether firms could benefit from introducing a policy on MRP as in other jurisdictions like the USA.

The remainder of the study is structured as follows: In the next section, we review the relevant literature and develop our hypotheses. The third section outlines the data, methodology, and measurements. In the fourth section, we present the empirical analysis, including additional tests. Finally, the last section provides the study's conclusions.

Literature Review and Hypotheses Development

A business strategy is defined in this study as a course of action or set of executive decisions to assist managers and employees achieve specific long-term business objectives (Snow and

Hambrick, 1980). A business strategy is concerned with organising resources and implementing plans to secure a competitive market position. Prospector and defender strategies are two viable business strategies sitting at either end of the spectrum. CEOs adopting the prospective strategy transform firms into innovative market leaders by changing their product mix, while firms adopting the defender strategy, compete on price, service, and quality, while maintaining a narrow and stable market focus (Khedmati et al., 2018, Bentley et al., 2017, Miles and Snow, 1978). Firms adopting a prospective strategy invest in research and development and move quickly to identify and venture into new markets and product opportunities (Miles and Snow, 1978; 2003). Managers of prospector firms require freedom and flexibility to identify opportunities and act on them rather quickly (McDaniel and Kolari, 1987). Prospector firms that invest in high-risk and high-growth projects are faced with greater agency problems (Rajagopalan, 1997). Empirical evidence shows that managers in prospector firms may engage in investment projects that maximise their interests at the expense of short-term profitability. Rajagopalan, (1997) similarly argue that prospector firms tend to face greater agency problems when growth is high.

On the other hand, firms adopting a defender strategy invest less on research and development, focus on narrow product lines, cost reduction strategies and stability (Miles and Snow, 1978, Miles and Snow, 2003). Rajagopalan (1997) argues that the business risk facing defender firms is low compared with prospector firms due to lower uncertainty and a higher focus on efficient operations. Defender firms offer considerably lower managerial discretion by imposing strict rules and monitoring mechanisms in their business operation to reduce risk-taking (Thomas and Ramaswamy, 1996). Executives of defender strategy firms are claimed to have superior managerial skills, enjoy lower risk, possess superior knowledge of business activities, and have effective relationships with customers and suppliers. Hence, defender strategy firms are expected to be more efficient in their business activities, resulting in reduced agency problems between managers and principals. The Miles and Snow typology provides a well-established classification of business strategies that align with CEO decision-making tendencies. Specifically, prospector firms are innovation-driven actively seeking new opportunities and growth, making them risk-taking firms. On the other hand, defender firms focus on efficiency, cost control, and stability, prioritizing existing markets over expansion. These strategic orientations are expected to be influenced by CEO demographic traits such as age, tenure, and education, which affect risk tolerance, decision-making styles, and adaptability.

Several prior studies suggest that CEO characteristics significantly influence whether a firm

pursues a prospector or defender strategy. For instance: Older and longer-tenured CEOs tend to be more risk-averse, preferring stability and efficiency, aligning with defender strategies whereas younger and less-tenured CEOs are often risk-takers and open to change, making them more likely to adopt prospector strategies (Serfling, 2014, Li et al., 2021, Barker III and Mueller, 2002). Higher educational qualifications can be associated with greater openness to innovation, supporting a prospector orientation (Lin et al., 2011). The choice between a prospector and defender strategy has significant managerial and policy implications. Understanding how CEO age, tenure, and education influence strategic choices helps firms design better succession planning and corporate governance policies. Policymakers and corporate boards can use these insights to shape CEO appointment decisions and retirement policies, particularly in Australia, where mandatory retirement policies (MRPs) are being considered. Australia has a diverse corporate landscape, with industries requiring both exploratory (prospector) and efficiency-driven (defender) strategies. The Miles and Snow typology provides a strong framework to analyse how firms balance innovation versus stability, particularly in a governance-driven environment.

The aim of this study is to examine the effect of a CEO's demographic characteristics (age, tenure, and professional qualification) on business strategy choice. Upper echelon theory centres on executive cognitions, values, perceptions and their influences on the process of strategic choice and resultant outcomes (Hambrick and Mason, 1984). Such constructs are difficult to measure, prior research uses managerial characteristics such as age, functional background and educational experiences as proxy measures. Upper echelon theory is underpinned by three main principles (Hambrick and Mason, 1984). Firstly, strategic choices reflect the values and cognitive preferences of powerful actors including the CEO. Secondly, the values and cognitive preferences of key actors are a function of their observable characteristics such as education, age, and professional experience. Thirdly, significant organisational outcomes (e.g., audited financial reports) are associated with CEO observable characteristics. CEOs are considered powerful actors in the management hierarchy who possess the capability of influencing major strategic decisions and their implementation. CEOs play a critical role in making strategic decisions that influence the performance of the firm (Child, 1972). Miller and Droge (1986) show how firm strategies and structures can be influenced by the personalities of its leaders. Meyer and Goes (1988) claim that decisions on innovative strategies are likely when they are championed by the CEO.

Research on CEO characteristics and decision-making behaviours is abundant, categorised into three streams. One stream of research examines the impact of CEO characteristics on the strategic initiatives within the business. For example, the impact of CEO age on the amount of capital raised (Badru et al., 2017); CEO characteristics on corporate risk-taking (Farag and Mallin, 2018); the impact of board capital on the level of CSR disclosures (Muttakin et al., 2018). A second stream of research examines the role or influence of CEO characteristics and managerial decision-making. CEO gender has been linked to risk-taking (Byrnes et al., 1999); CEO overconfidence has been linked to corporate acquisitions (Brown and Sarma, 2007); CEO age has been linked to the choice of voluntary financial disclosures (Bamber et al., 2010) and investment decisions (Li and Tang, 2010; Serfling, 2012); and the influence of CEO characteristics on financial leverage (Ting et al., 2015). The third stream of research is concerned with the responsibility of the CEO to ensure that the firm performance is aligned with firm objectives. Prior studies focus on the CEO's impact on firm performance by using different CEO characteristics including the CEO's background or personality (Zhu and Chen, 2015; Wang et al., 2016) and leadership style (Waldman et al., 2001). Whilst research is abundant on CEOs, few studies have investigated the impact of CEO characteristics on firm strategy (Chatterjee and Hambrick, 2007; Simsek et al., 2010). In a recent study, Michael et al. (2022) CEOs with no legal expertise in the post-SOX period led to more stock liquidity through the appointment of executives with legal expertise to the top management counsel to provide the advising and monitoring functions to the CEOs. Pham (2020) finds that CEOs with legal backgrounds or qualifications improve the stock market liquidity and lower insider trading profits.

Hypothesis Development

CEO age

Prior research on age and the risk-taking behaviour of managers provides conflicting predictions and results. One strand of literature argues that young managers are more risk-averse and more conservative in choosing investments, as they are more concerned about the implications on their reputation and career (Holmstrom, 1999; Hirshleifer and Thakor, 1992 and Scharfstein and Stein, 1990). The careers of young managers are limited when they make poor investment decisions and have yet to prove their reputation in the labour market. They therefore act conservatively to protect their reputation and career opportunities. This leads young managers to avoid innovative investment decisions and focus more attention on

investments that can be evaluated by markets so that they can progressively build up their reputation in the labour market. Another strand of literature claims that young managers are more aggressive and risk-takers in investment projects to signal to the market that they are quality managers (Prendergast and Stole, 1996; Farang and Mallin, 2018). For instance, Barker III and Mueller (2002) find that R&D spending is higher in firms led by younger CEOs, although a CEO's formal education does not have a significant impact on R&D spending when a college degree has been attained in the U.S. Similarly, Li et al. (2021) report that CEO age, more than tenure, plays a key role in determining risk-related corporate R&D investments in China. These claims are supported by Hambrick and Mason (1984) who provide evidence on young managers making risky investments and older managers expressing concern for their financial and career security.

Older managers are more concerned with maintaining their firms' status quo and are less able to learn new behaviours and implement new ideas due to their mental and physical status. Vroom and Pahl (1971) similarly found that older managers are more conservative in their investment strategies. In more recent research, Serfling (2014) similarly suggests that older CEOs reduce firm risk through less risky investment policies. Furthermore, older CEOs invest less in research and development, manage firms with more diversified operations and maintain lower operating leverage (Serfling, 2014). This body of research suggests that age affects an individual's risk appetite and behaviours (Rhodes, 1983; Taylor, 1975). On balance, prior research suggests that older individuals are more risk-averse compared with their younger counterparts. We therefore posit that CEOs are likely to become more conservative with age, and older CEOs are less likely to adopt a prospector strategy that requires more uncertainty and risk-taking investments. The following hypothesis is thus proposed:

H1: CEO age is negatively associated with the adoption of the prospector strategy than the defender strategy.

CEOs tenure

A number of prior studies claim that CEO tenure influences corporate investment decisions. Hambrick and Fukutomi (1991) suggest that long-tenured CEOs become committed to their business strategy, avoid information that challenges this business strategy and ignore calls for change. As a result, firms may find it difficult to progress and struggle to survive with long-term survival. Chen and Zhang (2014) claim that when CEO tenure is extended, CEOs become more risk-taking and reduce their effort in their investment decisions. Young CEOs who

express concern with enhancing their status at the beginning of their career, have strong incentives to invest in short-term investment projects (Hirshleifer, 1993). Based on this argument, tenure is expected to have an impact on investment cash flow sensitivity. Older managers who have access to internal funds, invest in low-risk projects to avoid shareholder pressure through corporate governance mechanisms. Older managers can harmonise board members and reduce the effect of corporate governance mechanisms on their decisions, leading to cash flow sensitivity (Mohamed et al., 2014). Li and Tan (2013) argued that as CEO tenure increases, CEOs refrain from making changes and innovating new ideas and focus more on stability and efficiency that support the adoption of a defender strategy.

An alternative argument suggests that longer periods of tenure can increase managerial power (Ryan and Wiggins, 2004). However, Brochet et al. (2021) suggest that firm value declines with the length of CEO tenure, when CEOs are less adaptable to changes, and when CEO entrenchment is high. Simsek (2007) states that CEO tenure directly influences the risk-taking propensity of the TMT, leading to an indirect positive influence on firm performance. The increase in CEO tenure leads to more non-diversified human capital invested in the firm (Berger et al., 1997). Under this condition, prospect theory suggests that people place a higher value on avoiding loss than on realising new gains (Kahneman and Tversky, 1979). Simsek (2007) argues that the marginal benefit of additional gains is outweighed by the risk of losing prior gains, thus, long-tenured CEOs become risk averse. However, in Europe, Martino et al. (2020) investigated Italian family firms and found that a longer CEO career horizon is positively associated with firm's risk-taking. In a most recent study, Loukil and Yousfi (2023) studying French firms, find that long-tenured CEOs tend to reduce risk and leverage, whereas older CEOs are more likely to use debt to finance internal growth. Notably, their study also finds that CEO attributes have a weaker influence on risk-taking strategies in family firms compared to non-family firms. We argue that risk-taking behaviour and the willingness to embrace strategic risk are likely to change over time. Therefore, we hypothesise that:

H2: The length of CEO tenure is negatively associated with the adoption of the prospector strategy than the defender strategy.

CEOs education

A review of prior literature on the education of CEOs finds inconclusive results. One stream of literature based on upper-echelon theory claims that highly educated CEOs are more open

to new ideas and changes in investments and are less risk-averse (Barker and Mueller, 2002). Supporting this evidence is Beber and Fabbri (2012) who find that overconfident directors with an MBA degree may be willing to accept more risk. A recent study by Farag and Mallin (2018) finds that CEOs with experience and hold a postgraduate qualification are more likely to make risky decisions. Lin et al. (2011) similarly report evidence supporting CEOs' education leading to increased innovation in private companies in China. Li and Tan (2013) argue that CEOs with higher educational levels are more likely to adopt technology strategies that are innovative, flexible and consistent with the prospector strategy. Setiawan and Gestanti (2022) find that CEO education negatively affects financing policy but positively affects investing policy and performance. On the other hand, Daellehbach et al. (1999) failed to find a significant relationship between CEO education and expenditure on research and development. Wang et al. (2022), focusing on companies listed in China's Growth Enterprises Market, find that founder CEOs with higher education levels, as well as female founder CEOs, are associated with greater innovation efficiency. On the other hand, in Europe, Martino et al. (2020) investigated Italian family firms and found that CEO family ties and higher education levels are negatively associated with the firm's risk-taking. Even though the existing literature on CEO education provides mixed results, the findings generally support a positive relationship between CEO postgraduate education and the likelihood of innovative and risk-taking behaviour. Therefore, we hypothesis that:

H3: The CEO's educational level is positively associated with the adoption of the prospector strategy than the defender strategy.

Data and research design

We collect data from listed firms on the Australian Securities Exchange (ASX) from 2004 to 2018. CEO characteristics and financial data for the years 2004–2014 are obtained from the Securities Industry Research Centre of Asia Pacific (SIRCA) database. For the period 2015–2018, these data are sourced from BoardRoom. We compute business strategy using variables obtained from the DataAnalysis database. Several observations were removed from the sample due to missing data on CEO characteristics. In line with Anderson et al. (2004), we exclude financial companies, as they have distinct governance structures and operate under specific regulatory frameworks. Additionally, for exclusions such as financial firms, we reference recent studies that have applied similar data-cleaning methodologies (e.g., Ferdous et al., 2024;

Atawnah et al., 2024). Therefore, the final sample is an unbalanced panel comprising 4,826 firm-year observations over the sample period.

Measurements

Test variable: CEOs' characteristics

We collect data on CEO demographic characteristics, namely age, tenure, and education. We identify the CEO's age as of the balance sheet date. This variable equals 1 if the CEO's age is greater than 65, and 0 otherwise. In this study, we focus on the retirement age of directors, which, based on the U.S. Spencer Stuart Board Index (2018), averages around 73. Consequently, we set 65 years as our benchmark for measuring CEO age. This threshold aligns with prior research, such as Helland (2006) and Zaman et al. (2021), which consider directors aged 65 and above to be approaching retirement age. CEO tenure is a continuous variable representing the difference between the CEO's appointment date and the balance sheet date. To measure CEO education, we create a dummy variable that takes the value of 1 if the CEO holds a postgraduate qualification (e.g., Master's and/or PhD), and 0 otherwise.

Dependent variable: business strategy

The dependent variable is the composite score used to measure business strategy. We compute a discrete *BSIA* composite measure comprised of six individual metrics to calculate a business strategy index (Bentley et al., 2013; Higgins et al., 2015): (i) the ratio of research and development expenditure to sales, (ii) the ratio of employees to sales, (iii) a historical growth measure (one-year percentage change in total sales), (iv) the ratio of marketing (Selling General & Administrative expenses) to sales, (v) employee fluctuation (standard deviation of total employees), and (vi) capital intensity (net Property, Plant, and Equipment scaled by total assets). Please refer to Appendix 2 for more details on how to measure each variable. Consistent with prior research (Ittner et al., 1997, Bentley et al., 2013, Higgins et al., 2015), all variables are measured using per company-year, based on a rolling five-year average. Each variable within each industry and year is categorized into quintiles: the highest quintile receives a score of 5, the second highest quintile receives a score of 4, and so forth, down to the lowest quintile which receives a score of 1. However, for capital intensity, the scoring is reversed such that observations in the lowest quintile receive a score of 5, and those in the highest quintile receive

a score of 1. The scores are summed over the six measures and per company year such that a company could receive a maximum score of 30 (prospector type) and a minimum score of 6 (defender type). Therefore, our discrete *BSIA* score ranges from 6 to 30, with defender-type and prospector-type companies closer to the endpoints.

Control variables

We include several control variables in our analysis to account for factors that may influence strategic decision-making and ensure the robustness of our findings. CEO compensation (*LNTCEOREM*), measured as the natural logarithm of total CEO remuneration, is included to control for the potential effects of executive pay on corporate strategy. The leverage ratio (*DEBTRATIO*), defined as total debt to total assets, accounts for financial constraints and risk exposure, which may impact strategic choices. CEO gender (*F1MO*) is introduced as a dummy variable, taking a value of 1 if the CEO is female and 0 otherwise, to capture potential gender-based differences in leadership and decision-making. Firm size (*LNTA*), measured as the natural logarithm of total assets, is included to account for variations in strategic behaviour between large and small firms. Profitability (*ROA*), reflected by return on assets, controls for firm performance, which plays a critical role in shaping strategic priorities. Auditor type (*BIG4*) is a dummy variable set to 1 if the firm's principal auditor is one of the Big 4, capturing differences in financial reporting quality and governance associated with reputable audit firms. Additionally, we incorporate control variables aligned with prior research on corporate strategy determinants. Board independence (*BIND*), measured as the percentage of independent board members, is included to assess the influence of governance structures on strategic decision-making. Firm age (*LNAGEOFF*), calculated as the natural logarithm of firm age, accounts for the impact of organizational maturity on strategy formulation. CEO nationality (*N0A1*) is introduced to explore whether variations in strategic decisions are associated with the CEO's background. The market-to-book ratio (*MKTBKR*), derived from share price divided by book value per share, serves as an indicator of market perception and its potential influence on corporate strategy. To mitigate endogeneity concerns, we measure the dependent variable at year t and all regressors at year $t-1$. Continuous variables are winsorized at the 1st and 99th percentiles to address the impact of outliers (Alharbi et al., 2024). Furthermore, we incorporate industry and year fixed effects in all regressions and cluster standard errors at the firm and year levels to enhance the reliability of our estimates.

Model Specification

The Model Specification section requires further elaboration to clearly outline the inclusion of fixed effects and justify their use. Our primary specification examines the business strategy index as a function of CEO demographic characteristics and various control measures, following prior research on strategy determinants (Khedmati et al., 2018, Navissi et al., 2017). We employ the following regression model to analyze the relationship between CEO characteristics and business strategy:

$$BSIA_{i,t} = \alpha + \beta_1 CEO \text{ Characteristics} + \text{Control variables} + \varepsilon$$

Where, $BSIA_{i,t}$ represents the business strategy measure, $\beta_1 CEO$ Characteristics is the CEO's characteristics. Control variables account for additional firm-specific factors that may influence strategic choices, as defined in Appendix I. To address unobserved heterogeneity and improve estimation accuracy, we include industry and year fixed effects. Industry fixed effects control for sector-specific characteristics such as market competition, regulatory environments, and technological advancements, ensuring that our results are not biased by industry-wide variations. Year fixed effects account for macroeconomic fluctuations, policy shifts, and other time-specific influences that could impact firms' strategic decisions. By incorporating these fixed effects, we reduce the risk of omitted variable bias and ensure that our findings capture the true relationship between CEO characteristics and business strategy, independent of broader industry trends and temporal shocks.

Descriptive Statistics

Table 1 presents the descriptive statistics of the sample, providing insight into key CEO characteristics and firm-specific factors. The logarithm of CEO age is 4.25, which translates to an approximate CEO age of 70 years, indicating that, on average, firms in the sample are led by highly experienced executives. Similarly, the average natural logarithm of CEO tenure is 1.83, implying a tenure of around 6.2 years, suggesting that most CEOs have been in their roles long enough to influence strategic decisions. Regarding education, the proportion of CEOs with professional qualifications is 0.18, meaning only 18% of the sample CEOs hold advanced degrees or certifications, which may have implications for decision-making and strategic direction. The business strategy index has an average value of 17.326. In terms of firm characteristics, the average firm size, measured as the natural logarithm of total assets ($LNTA$), is 19.24, equating to \$201 billion in total assets. The leverage ratio ($DEBTRATIO$) averages

39%, indicating that, on average, firms finance 39% of their assets through debt. Lastly, CEO remuneration, expressed as the natural logarithm of total compensation, averages 13.53, translating to approximately \$756, reflecting typical executive pay levels in the sample firms. These statistics provide valuable context for understanding the characteristics of the sample and how they may relate to business strategy decisions.

Insert Table 1 Here

Empirical analysis

Correlations between our major variables of interest

In Table 2, we present the Pearson correlations between the independent variables (specifically CEO characteristics) and the control variables within our hypothesized model. Our analysis reveals that the business strategy variable, denoted as *BSIA*, exhibits a significant negative correlation with both *LNAGE* (the natural logarithm of the firm's age) and *LNCEOTY* (the natural logarithm of the CEO's tenure). This finding suggests that as the firm's age and the CEO's tenure increase, there is a tendency for the business strategy to shift in a direction that is inversely related to *BSIA*. Conversely, we observe a significant positive correlation of 0.14 between the CEO's professional qualification, specifically having an MBA (*PQMBA*), and *BSIA*. This indicates that CEOs with an MBA tend to be associated with business strategies that positively align with *BSIA*. Overall, the nature and magnitude of these correlations suggest that the independent variables, including CEO characteristics and the control variables, can be effectively combined to construct a parsimonious regression model. This approach ensures that we account for relevant variables while maintaining model simplicity.

Insert Table 2 Here

Baseline Results - CEO Characteristics and Business Strategy

The data presented in Table 3 reports our baseline regression results examining the relationship between three CEO characteristics and business strategy. These results are adjusted for standard determinants of business strategy, as well as industry and year-fixed effects. We conduct an ordinary least squares regression with standard errors clustered by firm. We present the results for four specifications: models 1, 2 and 3 examine the impact of *AGE*, *PQMBA* and *LNCEOTY*, separately on business strategy, Model 4 examines the effect of all three CEO

attributes *AGE*, *PQMBA* and *LNCEOTY*, on business strategy.² We find that the estimated coefficients of *AGE*, and *LNCEOTY* are negative and significant in all models. These findings indicate that higher levels of CEO attributes: *AGE* and *LNCEOTY* increase managerial power and as a consequence, CEOs adopt a defender strategy. Model 2 examines the effect of CEO education (*PQMBA*) on business strategy. We find that the estimated coefficient of *PQMBA* is significantly positive in all models. These findings indicate that educational background increases CEO receptiveness toward innovative investment and risk-taking and are more prone to adopting a prospector strategy.

Insert Table 3 Here

The estimated coefficient for the size variable (*LNTA*) shows the expected positive sign and is statistically significant at the 1% level, indicating that larger firms are more likely to adopt the prospector strategy. This result aligns with prior studies. The coefficient for mature firms (*LNAGEOFF*) is positive and statistically significant, suggesting that CEOs of mature firms are also likely to choose the prospector strategy. Conversely, the coefficient for the *N0A1* variable is negative and statistically significant, indicating that CEOs of firms with a high *N0A1* are more inclined to choose the defender strategy. The coefficient for large auditor firms (*BIG4*) is significant and positive, suggesting that firms with *Big 4* auditors are more likely to adopt the prospector strategy. The coefficients for leverage (*DEBTRATIO*) have the expected positive sign and are statistically significant at least at the 1% level. The coefficient for board independence (*BIND*) is not significant. Overall, CEO demographic characteristics significantly impact the choice of business strategy, even when controlling for other relevant variables.

Robustness tests

To assess the robustness of our baseline evidence, we conduct a series of tests. First, as an alternative measure of CEO age, we use the natural logarithm of age to account for potential nonlinear effects. As shown in Panel A Table 4, the coefficients of *LNAGE* are both negative and statistically significant at the 1% level across all model specifications. This consistency suggests that our findings are not driven by the specific choice of proxy for CEO age, thereby reinforcing the validity of our earlier conclusions. Second, to evaluate the stability of CEO characteristics over time, we rerun the baseline regression while excluding data from the global

² We find that our results remain when we use a logarithm of CEO age.

financial crisis of 2007–2009, a period of significant economic turbulence that may have influenced firm performance and decision-making. The results, presented in Panel B (Table 4), remain qualitatively similar to our main findings, further supporting the robustness of our conclusions. These tests collectively confirm that our results are not sensitive to changes in measurement or sample selection, strengthening the credibility of our analysis.

Insert Table 4 Here

Unobserved time-invariant firm-related omitted variables bias

A potential under-specification bias arises from time-invariant firm-specific omitted variables that may influence the observed relationships between CEO characteristics and business strategy. Factors such as corporate culture, governance structures, or long-term strategic orientation could systematically affect firms' strategic decisions, leading to biased estimates if not properly accounted for. To mitigate this concern, we include firm fixed effects in our model, which allow us to control for unobservable, time-invariant firm characteristics, ensuring that our results capture within-firm variations rather than cross-sectional differences. This approach aligns with prior research (e.g., Atawnah et al., 2024; Alharbi et al., 2021), which similarly employs firm fixed effects to address omitted variable bias in studies examining executive decision-making and corporate strategy. Additionally, we conduct a robustness check incorporating both firm and year fixed effects, and as presented in Table 5, our results confirm that CEO characteristics remain significantly and negatively related to the business strategy index. This consistency reinforces our conclusion that the relationship between CEO characteristics and business strategy is not driven by firm-specific time-invariant omitted factors, further strengthening the reliability of our findings.

Insert Table 5 Here

Instrumental variable approach

Our approach to mitigating endogeneity concerns is the instrumental variable (IV) method, utilizing the approach developed by Lewbel (2012). While the traditional IV approach relies on an external instrument, Lewbel's (2012) model generates an internal instrument based on heteroskedastic errors, where error correlations arise from unobserved common factors (Mavis et al., 2020). Given the challenges in identifying a suitable exogenous instrument (Jiang, 2017), this method has been widely adopted in contemporary research to address endogeneity issues. The results from this analysis are presented in Table 6. We find that the internal instruments

generated by Lewbel (2012) are appropriate for estimating the second-stage regressions, as they do not suffer from under-identification, weak identification, or overidentification problems. Due to brevity, we do not report all post estimation results. However, the second-stage regression from the IV approach confirms that the coefficient for IV-estimated CEO characteristics remains significant, reinforcing our main finding that the negative relationship between CEO characteristics and business strategy is not merely an artifact of endogeneity.

Insert Table 6 Here

Propensity scores matching analysis

To further validate our findings, we employ propensity score matching (PSM) to examine whether firms led by CEOs with specific traits are more likely to adopt the defender strategy. PSM helps address potential endogeneity concerns by ensuring that our treatment and control groups are comparable in terms of observable characteristics, thereby reducing selection bias. This method has been widely applied in corporate governance and strategy research (e.g., Alharbi et al., 2024). We define treatment firms as those with mature CEOs—individuals with above-median scores for age, professional qualifications, and tenure—while control firms are those led by younger CEOs, lacking professional qualifications, and having shorter tenures. Using the annual industry median of CEO characteristics as the cut-off, we perform one-to-one nearest neighbour matching with replacement, so that we may pair treatment firms with similar control firms. The matching is based on key firm characteristics presented in Table 6, ensuring that differences in business strategy choices are not driven by observable firm-level factors. To enhance the precision of our matching, we implement a caliper width of 0.05, following best practices in the literature (Ferdous et al., 2024). Panel A of Table 7 confirms the effectiveness of our matching procedure, as the mean values of control variables do not significantly differ between treatment and control firms. Panel B presents the regression results using the matched sample, demonstrating a significant negative relationship between business strategy and both CEO age and tenure. Additionally, Model 2 indicates that CEO education (*PQMBA*) positively influences business strategy choices. These results reinforce our main findings, suggesting that CEO characteristics play a crucial role in shaping corporate strategic decisions.

Insert Table 7 Here

Lagged CEOs Characteristics

The relationship between CEO characteristics and business strategy could be driven by reverse causality or simultaneity issues. To mitigate this endogeneity bias, we use the lagged value of the CEO characteristics in the regression analysis. While the lagged variable cannot entirely solve the endogeneity problem, they are suitable to alleviate the concern of reverse causality. Table 6 reports results for the models with the lagged value of the CEO characteristics variable. The results confirm the relationship between CEO characteristics and business strategy.

The relationship between CEO characteristics and business strategy reflects both the influence of executive traits on strategic choices and the deliberate actions of boards in selecting leaders aligned with specific strategic goals. Firms that adopt a prospector strategy, characterized by innovation and exploration, tend to appoint CEOs who are younger, more educated, or have professional qualifications that support dynamic leadership. In contrast, firms that follow a defender strategy, focused on efficiency and stability, are more likely to select CEOs with greater age, longer tenure, and extensive experience. This pattern suggests that CEO appointments are not random but are shaped by the strategic orientation of the firm. As such, the observed associations in this study are not merely artifacts of endogeneity but reflect intentional alignment between leadership and strategy. Understanding this alignment provides important insights into how firms implement and sustain their strategic objectives through executive selection.

Insert Table 8 Here

CEO Age and Firm Performance

Prior research suggests that CEO age influences managerial decision-making, risk-taking behaviour, and overall firm strategy. Younger CEOs are generally more inclined to adopt a prospector strategy, which prioritizes innovation, market expansion, and technological advancements. This strategy benefits from reduced information asymmetry, allowing firms to exploit emerging opportunities and achieve higher performance. In contrast, older CEOs are often more risk-averse, favouring the defender strategy emphasizing efficiency, cost control, and incremental improvements rather than aggressive expansion. This conservative strategy may lead to slower growth and lower firm performance, particularly in dynamic industries requiring constant adaptation. Given this theoretical foundation, we examine whether CEO age negatively affects firm performance through strategic choices. Specifically, we hypothesize

that if CEO age increases information asymmetry, there will be a negative relationship between mature CEOs and firm performance. Information asymmetry arises when older CEOs, who have spent decades in leadership roles, rely on established routines and personal networks, potentially limiting their ability to respond to new market trends effectively. This asymmetry may result in suboptimal decision-making, ultimately leading to weaker financial performance. To test this hypothesis, we define CEO age as a dummy variable, assigning a value of 1 if the CEO is older than 65 and 0 otherwise. The dependent variable in our regression analysis is return on equity (*ROE*), a widely used measure of firm performance. Following previous literature, we include control variables consistent with those used in the baseline model that examines the determinants of business strategy. These controls account for firm size, industry characteristics, leverage, and other factors that may influence firm performance. We present the empirical results in Table 9, which confirm that CEO age is significantly and negatively associated with firm performance, supporting our hypothesis that firms led by mature CEOs tend to underperform. To further examine the robustness of this relationship, we explore the moderating effects of CEO qualifications and tenure by incorporating interaction terms for *CEO Age * Professional Qualification (PQMBA)* and *CEO Age * CEO Tenure* in Models 2 and 3 of Table 7. The results indicate that, regardless of the interaction term used, CEO age remains significantly and negatively related to firm performance. This suggests that even when CEOs possess higher professional qualifications or longer tenures, the negative impact of age on firm performance persists.

Overall, our findings provide strong evidence that CEO age is a crucial determinant of firm performance. Firms led by mature CEOs, who are more likely to adopt a defender strategy, exhibit lower performance levels compared to those with younger, more risk-tolerant CEOs. This result aligns with prior research suggesting that firms emphasizing innovation and proactive market strategies tend to outperform those focused on cost efficiency and stability. Moreover, the lower performance levels observed in firms with a defender strategy provide a plausible explanation for the previously reported negative relationship between CEO age and business strategy. These findings have important managerial implications, suggesting that firms operating in highly competitive and dynamic markets should carefully consider the strategic implications of CEO succession planning. Organizations seeking growth and adaptability may benefit from appointing younger, more innovative leaders who are willing to embrace change and uncertainty. In summary, our study highlights the negative impact of CEO age on firm performance, mediated through strategic choices. By leveraging insights from both

theoretical and empirical perspectives, we demonstrate that firms with mature CEOs tend to underperform, even when accounting for CEO qualifications and tenure. These findings contribute to the growing literature on the role of executive characteristics in shaping corporate outcomes and underscore the importance of aligning leadership profiles with strategic objectives.

Insert Table 9 Here

The study assumes that Prospector and Defender strategies are distinct and mutually exclusive, which may not fully reflect the complexity of real-world corporate strategies. In practice, many firms adopt hybrid strategies that combine elements of both approaches, potentially offering a more comprehensive understanding of business strategy. To address this limitation, we extend the analysis to incorporate hybrid strategic typologies, specifically including Analyzers, which blend characteristics of both Prospectors and Defenders. Table 10 presents the results of the Probit regression analysis examining the impact of CEO characteristics on business strategy, classified as dummy variables for Prospector, Analyzer (Hybrid), and Defender strategies. The regression results for the Prospector strategy indicate that CEO AGE has a significant negative relationship, suggesting that older CEOs may be less likely to lead firms adopting a Prospector strategy. Conversely, *PQMBA* is positively associated with the Prospector strategy, highlighting that CEOs with higher educational qualifications tend to lead firms focused on exploration and innovation. *LNCEOTY* also shows a negative effect, implying that larger CEO compensation might be linked to a preference for less aggressive strategies. For the Analyzer strategy (Hybrid), the results indicate that *AGE* remains negatively significant, reinforcing the pattern observed in the Prospector strategy. However, *PQMBA* shows a weaker, yet positive, relationship, and *LNCEOTY* has a mild negative impact, indicating that CEO characteristics continue to influence the choice of a hybrid strategy but with less intensity than in the Prospector case. In the case of the Defender strategy, *AGE* positively impacts the likelihood of adopting a more conservative strategy, while *PQMBA* shows a significant negative association, suggesting that CEOs with higher educational qualifications may prefer more flexible, adaptive approaches. Interestingly, *LNCEOTY* does not exhibit a significant relationship with the Defender strategy, suggesting that CEO compensation is less influential in firms adopting a Defender strategy. By including the Analyzer (Hybrid) category, this analysis provides a more nuanced understanding of corporate strategy, acknowledging that many firms do not strictly adhere to a single strategic type. The results highlight the importance of CEO characteristics, such as age, educational background, and compensation, in shaping the strategic direction of

firms, offering a more comprehensive framework for understanding business strategy beyond the traditional binary distinction of Prospector versus Defender strategies.

Insert Table 10 Here

Conclusion

The quality of the CEO and TMT have a significant impact on the firm's business strategy, making it a key issue for shareholders when it affects stock price. Research subsequently reflects on the assessment of CEO characteristics, skills, and risk profiles and its impact on firm performance. Therefore, the research in this study on the CEO's demographic characteristics, business strategy and performance, provides unique insights and adds to the existing literature on corporate governance and firm performance in the Australian context. Using listed companies during the period 2004-2018, this study examines the association between CEO demographic characteristics and business strategies adopted by firms and firm performance. We empirically demonstrate the relationship between the CEO characteristics and business strategy. We find that CEO age is negatively associated with the prospector strategy. This empirical result shows that older CEOs are more risk-averse and younger CEOs are more likely to take risks and more willing to take advantage of market opportunities to gain a bigger market share. This is confirmed by the results reporting a negative significant relationship between CEO tenure and firms adopting the prospector strategy, suggesting that long-tenured CEOs are less likely to consider the prospector strategy. Moreover, longer-tenured CEOs appear to prefer stability and efficient operations rather than having an uncertain and unstable business model.

One possible explanation for the negative association between CEO tenure and the adoption of prospector strategies is that long-tenured CEOs may become more risk-averse over time due to increased organizational entrenchment or a desire to protect their legacy. Their deep familiarity with internal processes may reinforce preferences for the status quo, reducing openness to innovation. From a governance standpoint, firms can mitigate these effects through oversight mechanisms such as periodic external strategic reviews, board-level innovation committees, and performance-linked CEO evaluations. Additionally, separating the roles of CEO and board chair, or introducing soft term limits, can maintain strategic dynamism and reduce the risk of stagnation. These interventions could help ensure that firms remain adaptable in dynamic markets while still benefiting from the experience of seasoned leaders. Our results also show a highly significant and positive relationship between CEO education and the prospector

strategy. We argue that highly educated CEOs are more likely to adopt an innovative business model and adopt high-risk-taking projects representing key features of prospector strategy. Our results are also robust for controlling other determinants of strategic choice (e.g. firm characteristics), controlling for firm fixed effects, and propensity score matching. In addition, we investigated the impact of CEO age on firm performance and detected a negative relationship. Business strategy plays an important role in determining the specific operational environmental facts such as product and market domain and organizational structure, all having an impact on firm performance (Miles and Snow, 1978, 2003). We argue that older CEOs tend to adopt a stable defender strategy to focus on existing products and markets rather than a prospector strategy where CEOs seek new products and markets. This strategy could lead to a decline in organisational performance over time in more competitive markets.

The results of this study pertain to the Australia setting in which there is an absence of MRPS suggesting that age and tenure exhibit a positive relationship with the defender strategy. This is consistent with the evidence in the US where risk and performance are inversely related to CEO age. However, the evidence in Europe for family firms challenges this relationship displaying a positive risk-taking relationship with age (Martino et al., 2020). In complementary body research in western countries examining the implications of investment behaviour of younger CEOs, the evidence is mixed with two strands of literature supporting both high and low risk-taking behaviour for younger CEOs. The former is intended to establish the CEO's reputation in the market place and the latter to protect the CEO's existing position. In terms of education, the evidence in the west (with the exception of Italian family firms (Martino et al., 2020)), suggests that managers tend to be more innovative and therefore adopt business strategies consistent with the prospector strategy. This is consistent with the research in China (Wang et al., 2022) including the results of the present study. Overall, the evidence on a country level is mixed and inconclusive suggesting that further country level studies is necessary to better understand the implications of age, tenure and education on business strategies and firm performance in different cultures.

Whilst MRPs have existed in some jurisdictions for quite a while, the issues both ethical and legal will become bigger with an aging population but have not been discussed extensively in the accounting literature. The key issue from an ethical perspective is whether an MRP is a discriminatory policy. Labour laws in many countries are implemented to protect employees from workplace discrimination, including hiring, firing, and compensation. However MRPs run counter to the concept of 'fair employment', when workers are terminated solely based the

criteria of age. The policy assumes that younger talent are in a better position to foster innovation and diversity, however, even if MRP create opportunities for younger workers, it remains questionable on whether it is ethical to end someone's employment based solely on age. This policy further assumes that a person's value in the workplace declines automatically with age, regardless of their performance, expertise, or contribution. However in reality, firms losing employees to a MRP run the risk of losing valuable institutional knowledge, mentorship, and stability. The ethics of MRPs and firm performance provides an avenue of research that has not been previously investigated in a significant way.

We caution readers from generalising the findings of this study as it is based in Australian listed companies where there is no mandatory retirement policy and follows specific corporate governance principles. Furthermore, although we identify strategic choice as a negative moderator for the relationship on CEO age and firm performance, we believe there may be other moderators affecting this relationship such as product market competition. Additionally, hiring policy or hiring trends within the labour market or particular industries could be influencing firms to acquire the talent of a particular type of CEO thereby creating a convergence effect in which CEOs gravitate to a particular business strategy. Furthermore, unexpected economic events outside a firm's control such as the global financial crisis can disrupt economic stability, thereby impacting businesses in negative ways. It is only when businesses have built up resilience will they be equipped to overcome shocks. Further research could investigate how business operations and performance are affected from external and expected shocks. This study has several policy implications. The empirical results provide useful insights to policymakers and shareholders. We argue that younger, short-tenured and CEOs with postgraduate qualification, are more likely to adopt a prospector strategy and engage in risk taking, develop innovative products, and seek new markets to enhance growth. Firms may rotate their CEOs to retain a degree of youth in these roles or policy makers could introduce MRPs in ways similar to other countries, such as the U.S. While our study suggests that different CEO demographic characteristics lead to the adoption of different business strategies in Australia, future research can explore the additional characteristics and investigate different institutional settings particularly in settings where MRPs are voluntary so that research may undertake a comparative analysis of firms with and without MRPs.

Appendix 1: Measurement description

<i>BSIA</i>	The strategy score is calculated using the discrete composite measure composed of six individual components. For each company and year, the scores of these six components are summed, resulting in a total score ranging from a minimum of 6 (indicating a defender-type strategy) to a maximum of 30 (indicating a prospector-type strategy).
<i>AGE</i>	It is a dummy variable taking a value of 1 if the CEO's age is greater than 65, and 0 otherwise.
<i>PQMBA</i>	It is a dummy variable taking a value of 1 if the CEO's qualification is a postgraduate and 0 otherwise.
<i>LNCEOTY</i>	It is a continuous variable that shows the difference between the appointed date of the CEO and the balance date.
<i>LNTCEOREM</i>	The natural logarithm of total CEO compensation paid.
<i>DEBTRATIO</i>	The ratio of total debt to total assets
<i>FIM0</i>	An indicator variable takes a value of 1 if the CEO is female and 0 if the CEO is male.
<i>LNTA</i>	Natural logarithm of total assets
<i>BIG4</i>	It is a dummy variable taking a value of 1 if the principal auditor of the firm is a Big 4, and 0 otherwise
<i>BIND</i>	Percentage proportion of the total number of board members who are identified as independent directors
<i>LNAGEOFF</i>	It is a continuous variable that calculates the age of the firm at the balance date by comparing it with the listing date of the firm.
<i>N0AI</i>	It is a dummy variable taking a value of 1 if the CEO's nationality is Australia, and 0 otherwise.
<i>MKTBKR</i>	It is computed by dividing the firm's share price by its book value per share.
<i>ROA</i>	The ratio of net income before extraordinary items to total assets

Appendix 2: variable measurement: Business strategy composite measure

Variable measures	Variable measurement
1). Ratio of research and development to sale (RDS5) <i>Company's propensity to search for new products.</i>	The ratio of research and development expenditures to sales is computed over a rolling prior five-year average.
2). Ratio of employee to sale (EMPS5) <i>The company's ability to produce and distribute. Products and services efficiently.</i>	The ratio of the number of employees to sales is computed over a rolling prior five-year average.
3). Change in total revenue (REV5) <i>Company's historical growth or investment opportunities</i>	One-year percentage change in total sales computed over a rolling prior five-year average.
4). Marketing to sale (SGA5) <i>The company's focus on exploiting new products and services</i>	The ratio of selling, general and administrative expenses to sales computed over a rolling prior five-year average.
5). Employee fluctuations (EMP5) <i>Company's organisational stability</i>	The standard deviation of the total number of employees computed over a rolling prior five-year period.
6). Capital intensity (CAP5) <i>The company's commitment to technological efficiency</i>	Capital intensity is measured as net PPE scaled by total assets computed over a rolling prior five-year average.

References

- Andrews, K. R. 1987. The Concept of Corporate Strategy. (3rd ed.), Irwin, Homewood, IL
- Anderson, R. C., Mansi, S. A. & Reeb, D. M. 2004. Board characteristics, accounting report integrity, and the cost of debt. *Journal of accounting and economics*, 37, 315-342.
- Arendt, L., Priem, R. & Ndofor, H. 2005. A CEO-Advise model of strategic decision making. *Journal of Management*, 31, 680-699.
- Badru, B.O., Ahmad-Zaluki, N.A., & Wan-Hussin, W.N. 2017. CEO characteristics and the amount of capital raised in Malaysian IPOs. *International Journal of Management Practice*, 10(4), 327-360.
- Bamber, L.S., Jiang, J., & Wang, I.Y. 2010. What's my style? The influence of top managers on voluntary corporate financial disclosure. *The Accounting Review*, 85(4), 1131-1162.
- Barker III, V. L., & Mueller, G. C. 2002. CEO characteristics and firm R&D spending. *Management Science*, 48(6), 782-801.
- Beber, A., & D. Fabbri. 2012. Who Times the Foreign Exchange Market? Corporate Speculation and CEO Characteristics. *Journal of Corporate Finance*.18 (5): 1065–1087.
- Bentley, K. A., Newton, N. J. & Thompson, A. M. 2017. Business strategy, internal control over financial reporting, and audit reporting quality. *Auditing: A Journal of Practice & Theory*, 36, 49-69.
- Bentley, K. A., Omer, T. C. & Sharp, N. Y. 2013. Business strategy, financial reporting irregularities, and audit effort. *Contemporary Accounting Research*, 30, 780-817.
- Berger, P. G., Ofek E., & Yermack D. L. 1997. Managerial entrenchment and capital structure decisions, *Journal of Finance*, 50, 1411– 1430.
- Bhagat, S. & Bolton, B. 2008. Corporate governance and firm performance. *Journal of Corporate Finance*, 14, 257-273.
- Brochet, F., Limbach, P., Schmid, M. & Scholz-Daneshgari, M. 2021. CEO tenure and firm value. *The Accounting Review*, 96, 47-71.
- Brown, R., & Sarma, N. 2007. CEO overconfidence, CEO dominance and corporate acquisitions. *Journal of Economics and Business*, 59(5), 358-379.
- Byrnes, J.P., Miller, D.C., & Schafer, W.D. 1999. Gender differences in risk taking: a meta-analysis. *Psychological Bulletin*, 125(3), 367.
- Chatterjee, A., & Hambrick, D.C. 2007. It's all about me: Narcissistic chief executive officers and their effects on company strategy and performance. *Administrative Science Quarterly*, 52(3), 351-386.
- Chen, D. & Zheng, Y. 2014. CEO tenure and risk-taking. *Global Business and Finance Review*, 19, 1-27.
- Child, J. 1972. Organizational structure, environment and performance: The role of strategic choice. *Sociology*, 6(1), 1-22.
- Cline, B. N. & Yore, A. S. 2016. Silverback CEOs: Age, experience, and firm value. *Journal of Empirical Finance*, 35, 169-188.
- Daellenbach, U. S., A. M. McCarthy, & T. S. Schoenecker.1999. Commitment to Innovation: The Impact of Top Management Team Characteristics. *R&D Management*,29 (3), 199–208.
- Datta, D. K. & Rajagopalan, N. 1998. Industry structure and CEO characteristics: An empirical study of succession events. *Strategic Management Journal*, 19, 833-852.
- Davidson, W. N., Xie, B., Xu, W. & Ning, Y. 2007. The influence of executive age, career horizon and incentives on pre-turnover earnings management. *Journal of Management & Governance*, 11, 45-60.
- Erjavec, J., Popovič, A. & Trkman, P. 2019. The effect of personality traits and knowledge on the quality of decisions in supply chains. *Economic Research-Ekonomska Istraživanja*, 32, 2269-2292.
- Farag, H., & Mallin, C. 2018. The influence of CEO demographic characteristics on corporate risk-taking: evidence from Chinese IPOs. *The European Journal of Finance*, 24(16), 1528-1551.
- Hambrick, D. C. & Fukutomi, G. D. S. 1991. The seasons of a CEO's tenure. *Academic of Management Review*, 16, 719-742.

- Hambrick, D. C. & Mason, P. 1984. Upper echelons: the organisation as a reflection of its top managers. *Academic of Management Review*, 9, 193-206.
- Harjoto, M. A., Laksmana, I. & Lee, R. 2015. The impact of demographic characteristics of CEOs and directors on audit fees and audit delay. *Managerial Auditing Journal*, 30 (8/9), 963-997
- Herrmann, P., & D. K. Datta. 2006. CEO Experiences: Effects on the Choice of FDI Entry Mode. *Journal of Management Studies*, 43 (4), 755-778
- Higgins, D. T. C., Omer, T. C. & Phillips, J. D. 2015. The influence of a firm's business strategy on its tax aggressiveness. *Contemporary Accounting Research*, 32, 674-702.
- Hirshleifer, D. 1993. Managerial Reputation and Corporate Investment Decisions. *Financial Management*, 22 (2), 145-160.
- Hirshleifer, D., & Thakor, A.V. 1992. Managerial conservatism, project choice, and debt. *Review of Financial Studies*, 5 (3), 437- 470.
- Holmström B., 1999, Managerial Incentive Problems: A Dynamic Perspective, *The Review of Economic Studies*, 66 (1), 169-182
- Huang, H. W., Rose-Green, E., & Lee, C. C. 2012. CEO age and financial reporting quality. *Accounting Horizons*, 26 (4), 725-740.
- Ittner, C. D., Lacker, D. F. & Rajan, M. V. 1997. The choice of performance measures in annual bonus contracts. *The Accounting Review*, 72, 231-255.
- Jagannathan, M. & Loon, Y. C. 2011. Mandatory retirement policies for CEOs. Available at SSRN: <https://ssrn.com/abstract=1536588> or <http://dx.doi.org/10.2139/ssrn.1536588>.
- Kahneman, D. & Tversky, A. 1979. Prospect theory: an analysis of decision under risk. *Econometrica*, 47, 263-291.
- Khedmati, M., Lim, E., Naiker, V. & Navissi, F. 2018. Business Strategy and the Cost of Equity Capital: An Evaluation of Pure versus Hybrid Business Strategies. *Journal of Management Accounting Research*, 31, 111-141.
- Li, J., & Y. I. Tang. 2010. CEO Hubris and Firm Risk-taking in China: The Moderating Role of Managerial Discretion. *Academy of Management Journal*, 53 (1), 45-68.
- Li, Y. & Tan, C.-H. 2013. Matching business strategy and CIO characteristics: the impact on organisational performance, *Journal of Business Research*, 66 (2), 248-259.
- Li, Y., Xu, X., Zhu, Y. & Haq, M. 2021. CEO decision horizon and corporate R&D investments: an explanation based on managerial myopia and risk aversion. *Accounting & Finance*, 61, 5141-5175
- Lin, C., Lin, P., Song, F. M., & Li, C. 2011. Managerial incentives, CEO characteristics and corporate innovation in China's private sector. *Journal of comparative economics*, 39 (2), 176-190.
- Loukil, N. & Yousfi, O. 2023. Do CEO's attributes increase risk-taking? Empirical evidence from France. *Asia-Pacific Journal of Business Administration*, 15, 721-745.
- Martino, P., Rigolini, A. & D'onza, G. 2020. The relationships between CEO characteristics and strategic risk-taking in family firms. *Journal of Risk Research*, 23, 95-116.
- Mcdaniel, S. & Kolari, J. 1987. Marketing strategy implications of the Miles and Snow strategic typology. *Journal of Marketing*, 51, 19-30.
- Meyer, A. D. & Goes, J. B. 1988. Organizational assimilation of innovations: a multilevel contextual analysis. *Academic of Management Review*, 31, 897-923.
- Miles, R. E. & Snow, C. C. 1978. *Business strategy, Structure, and Process*, New York, NY, McGraw-Hill.
- Miles, R. E. & Snow, C. C. 2003. *Organisational strategy, structure, and process*, Stanford, CA, Stanford University Press.
- Miller, D. & Droge, C. 1986. Psychological and traditional determinants of structure. *Administrative Science Quarterly*, 31, 539-560.
- Miller, D. & Toulouse, J. M. 1986. Chief executive personality and corporate strategy and structure in small firms. *Management Science*, 32, 1389-1409.
- Mohamed, E.B., Souissi, M.N., Baccar, A., & Bouri, A. 2014. CEO's personal characteristics, ownership and investment cash flow sensitivity: Evidence from NYSE panel data firms. *Journal of Economics Finance and Administrative Science*, 19 (37), 98-103.
- Muttakin, M.B., Khan, A., & Mihret, D.G. 2018. The effect of board capital and CEO power on corporate social responsibility disclosures. *Journal of Business Ethics*, 150 (1), 41-56.

- Navissi, F., Sridharan, V., Khedmati, M., Lim, E. & Evdokimov, E. 2017. Business strategy, over (under) Investment, and Managerial Compensation. *Journal of Management Accounting Research*, 29, 63-86.
- Norburn, D. & Birley, S. 1988. The top management team and corporate performance. *Strategic Management Journal*, 9, 225-237.
- Oshagbemi, T. 2004. Age influences on the leadership styles and behaviour of managers. *Employee Relations*, 26: 14-29.
- Papadakis, V. M. 2005. Do CEOs share the process of making strategic decisions? Evidence from Greece. *Management Decision*, 44, 367-394.
- Peng, M. 2003. Institutional Transitions and Strategic Choices. *Academy of Management Review*. 28. 275-296.
- Prendergast, C & Stole, L. 1996. Impetuous youngsters and jaded old-timers: Acquiring a reputation for learning. *Journal of Political Economy*, 104 (6), 1105-1134.
- Rajagopalan, N. 1997. Strategic orientations, incentive plan adoptions, and firm performance: Evidence from electric utility firms. *Strategic Management Journal*, 18, 761-785.
- Rhodes, S. R. 1983. Age-related differences in work attitudes and behavior: A review and conceptual analysis. *Psychological Bulletin*, 93(2), 328-367.
- Ryan, H. and R. Wiggins: 2004, 'Who is in Whose Pocket? Director Compensation, Board Independence, Barriers to Effective Monitoring', *Journal of Financial Economics*, 73, 497-524.
- Sariol, A. M. & Abebe, M. A. 2017. The influence of CEO power on explorative and exploitative organizational innovation. *Journal of Business Research*, 73, 38-45.
- Schaie, K. W, 1996. Intellectual Development in Adulthood: The Seattle Longitudinal Study. Cambridge University Press, Cambridge.
- Scharfstein, D.S., & Stein, J.C. 1990. Herd Behavior and Investment. *American Economic Review*, 80 (Jun.): 465-479.
- Serfling, M.A. 2012. CEO age, underinvestment, and agency costs. Eller College of Management, University of Arizona.
- Serfling, M. A. 2014. CEO age and the riskiness of corporate policies, *Journal of Corporate Finance*, Elsevier, 25(C), 251-273.
- Setiawan, R. & Gestanti, L. 2022. CEO characteristics, firm policy, and firm performance. *International Journal of Business and Society*, 23, 371-389.
- Shen, Y., Wallace, D., Reddy, K. & Ramiah, V. 2022. An investigation of CEO characteristics on firm performance. *Accounting & Finance*, 62, 3563-3607.
- Simsek Z. 2007. CEO tenure and organizational performance: an intervening model. *Strategic Management Journal*, 28(6), 653-662
- Simsek, Z., Heavey, C., & Veiga, J.J.F. 2010. The impact of CEO core self-evaluation on the firm's entrepreneurial orientation. *Strategic Management Journal*, 31(1), 110-119.
- Skirbekk, V. 2004. Age and individual productivity: A literature survey. *Vienna Yearbook of Population Research* 2, 133-153.
- Snow, C. C., & Hambrick, D. C. 1980. Measuring organizational strategies: Some theoretical and methodological problems. *Academy of Management Review*, 5(4), 527-538.
- Sundaram, R. K., & D. Yermack. 2007. Pay me later: Inside debt and its role in managerial compensation. *The Journal of Finance*, 62 (4), 1551-1587.
- Taylor, R.N. 1975. Psychological determinants of bounded rationality: Implications for decision-making strategies, *Decision Sciences*, 63(3), 409-429.
- Thomas, A. S. & Ramaswamy, K. 1996. Matching managers to strategy: Further tests of the Miles and Snow typology. *British Journal of Management*, 7, 247-261.
- Ting, I. W. K., Azizan, N. A. B., & Kweh, Q. L. 2015. Upper echelon theory revisited: The relationship between CEO personal characteristics and financial leverage decision. *Procedia-Social and Behavioral Sciences*, 195, 686-694.
- Vroom, V. H., & Pahl, B. 1971. Relationship between age and risk-taking among managers. *Journal of Applied Psychology*, 55(5), 399-405.

- Waldman, D.A., Ramirez, G.G., House, R.J., & Puranam, P. 2001. Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty. *Academy of Management Journal*, 44(1), 134-143.
- Waldman, D. A., Siegel, D. S. & Javidan, M. 2006. Components of CEO transformational leadership and corporate social responsibility. *Journal of Management Studies*, 43, 1703-1725.
- Wang, G., Holmes Jr, R.M., Oh, I.S., & Zhu, W. 2016. Do CEOs matter to firm strategic actions and firm performance? A meta-analytic investigation based on upper echelons theory. *Personnel Psychology*, 69(4), 775-862.
- Wang, Q., Pei, X. & Liang, H. 2022. Founder CEO, CEO characteristics, and firm innovation efficiency: An empirical study of China's GEM-Listed companies. *Sustainability*, 14, 8250.
- Zhang, R. 2016. Business Strategy and Firm Performance: The Moderating Role of Product Market Competition. Available at SSRN: <https://ssrn.com/abstract=2820147> or <http://dx.doi.org/10.2139/ssrn.2820147>.
- Zhu, D. H. & Chen, G. 2015. CEO narcissism and the impact of prior board experience on corporate strategy. *Administrative Science Quarterly*, 60, 31-65.

TABLE 1: Descriptive statistics of firm characteristics

This table reports the descriptive statistics for our sample. The Appendix provides a detailed description of the variables used in the regression analysis. We winsorize continuous variables at the 1% and 99% levels.

Variable	Sample	Mean	Median	SD	P25	P75	MIN	MAX
<i>BSIA</i>	4,826	17.326	18.000	2.119	15.000	20.000	6.000	30.000
<i>AGE</i>	4,826	0.365	0.000	0.436	0.089	0.543	0.000	1.000
<i>LNAGE</i>	4,826	4.252	4.211	0.317	3.989	4.551	3.555	4.848
<i>PQMBA</i>	4,826	0.181	0.000	0.385	0.000	0.000	0.000	1.000
<i>LNCEOTY</i>	3,840	1.833	1.881	0.883	1.331	2.453	1.048	3.626
<i>LNTCEOREM</i>	3,840	13.530	13.425	1.197	12.756	14.339	10.381	16.179
<i>DEBTRATIO</i>	4,826	0.398	0.395	0.269	0.168	0.568	0.006	1.233
<i>F1MO</i>	4,826	0.027	0.000	0.162	0.000	0.000	0.000	1.000
<i>LNTA</i>	4,826	19.246	19.026	2.487	17.544	20.775	13.982	26.447
<i>BIG4</i>	4,826	0.665	1.000	0.472	0.000	1.000	0.000	1.000
<i>BIND</i>	4,826	0.458	0.500	0.259	0.250	0.667	0.000	0.900
<i>LNAGEOFF</i>	4,826	2.482	2.565	0.892	1.946	3.091	0.000	4.174
<i>N0A1</i>	4,826	0.955	1.000	0.208	1.000	1.000	0.000	1.000
<i>MKTBKR</i>	4,826	2.542	1.648	2.845	0.964	3.000	0.000	17.609
<i>ROA</i>	4,826	-0.073	0.024	0.284	-0.112	0.078	-0.142	0.094

TABLE 2: Correlation matrix

This table presents the Pearson's coefficient of correlation between the variables used in this study. We present the variables definitions in the appendix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
<i>BSIA</i>	1													
<i>AGE</i>	-0.4161	1												
<i>PQMBA</i>	0.1378	-0.0243	1											
<i>LNCEOTY</i>	-0.0374	0.0548	0.0675	1										
<i>LNTCEOREM</i>	0.6851	-0.498	0.1166	0.0851	1									
<i>DEBTRATIO</i>	0.4867	-0.3774	0.0642	0.0231	0.4263	1								
<i>F1MO</i>	0.0611	-0.0731	0.0193	-0.0463	0.0302	0.0124	1							
<i>LNTA</i>	0.8607	-0.6557	0.1302	0.0987	0.7711	0.5298	0.0458	1						
<i>BIG4</i>	0.4312	-0.3205	0.0427	0.0334	0.4371	0.3066	0.0359	0.4898	1					
<i>BIND</i>	0.4141	-0.2925	0.0755	0.2052	0.4483	0.2117	0.0005	0.4605	0.2742	1				
<i>LNAGEOFF</i>	0.2615	-0.095	0.0819	0.1245	0.2307	0.112	-0.0108	0.2784	0.1603	0.1742	1			
<i>NOA1</i>	-0.1512	0.1093	-0.0532	0.0045	-0.1351	-0.0575	-0.0053	-0.1189	-0.0861	-0.1299	-0.0965	1		
<i>MKTBKR</i>	-0.0152	-0.0402	-0.0441	0.043	0.1335	0.0872	0.0286	-0.002	0.0696	0.0817	-0.1586	-0.0249	1	
<i>ROA</i>	-0.0843	-0.2164	0.1237	0.0543	-0.0216	0.0043	0.1689	0.1783	0.2173	0.0941	0.1283	0.0214	0.1321	1

TABLE 3: The impact of CEO Characteristics on Business Strategy

This table presents the regression results on the impact of CEO characteristics on business strategy. The dependent variable, *BSIA*, represents the strategy score as defined by Bentley et al. (2013).. We use *AGE*, *PQMBA* and *LNCEOTY* as measures of CEO characteristics. We use firm clustering to correct the standard errors. We winsorize continuous variables at the 1% and 99% levels. We report t-statistics in parentheses. The symbols ***, **, and * denote significance levels at the 1%, 5%, and 10% levels, respectively. We provide definitions of the variables in the Appendix.

	1	2	3	4
<i>AGE</i>	-0.9302 (-13.35)***			-0.6648 (-9.86)***
<i>PQMBA</i>		0.6114 (13.18)***		0.4836 (10.25)***
<i>LNCEOTY</i>			-0.0564 (-2.90)***	-0.056 (-2.98)***
<i>LNTCEOREM</i>	-0.0136 (-0.66)	-0.0246 (-1.21)	0.0344 (1.80)*	0.0254 (1.37)
<i>DEBTRATIO</i>	0.223 (2.65)***	0.2886 (3.36)***	0.2358 (2.78)***	0.2257 (2.78)***
<i>F1MO</i>	0.1783 (1.67)*	0.2052 (2.06)**	0.1254 (1.13)	0.0476 (0.42)
<i>LNTA</i>	0.5095 (35.81)***	0.5697 (44.78)***	0.5029 (39.15)***	0.4439 (32.58)***
<i>BIG4</i>	0.2123 (5.13)***	0.2501 (5.82)***	0.21 (5.20)***	0.1896 (4.88)***
<i>BIND</i>	-0.0272 (-0.40)	0.0029 (0.04)	0.0936 (1.40)	0.0698 (1.08)
<i>LNAGEOFF</i>	0.0907 (4.80)***	0.0485 (2.59)***	0.0395 (2.16)**	0.0541 (3.05)***
<i>N0A1</i>	-0.5794 (-6.18)***	-0.5432 (-6.20)***	-0.4228 (-4.09)***	-0.3904 (-3.93)***
<i>MKTBKR</i>	-0.0008 (-0.14)	0.0033 (0.57)	0.0003 (0.07)	0.0007 (0.13)
<i>ROA</i>	-0.0922 (-1.98)*	0.1824 (2.95)***	0.0343 (1.39)	-0.1309 (-2.06)**
<i>CONSTANT</i>	-3.4591 (-7.02)***	-8.5646 (-35.89)***	-7.9162 (-32.97)***	-3.8925 (-8.22)***
<i>Industry Effects</i>	Yes	Yes	Yes	Yes
<i>Year Effects</i>	Yes	Yes	Yes	Yes
<i>R2</i>	0.7322	0.7328	0.7486	0.7628
<i>F</i>	347.92	394.95	256.2	289.65
<i>Sample</i>	4,826	4,826	3,840	3,840

Table 4: Robustness tests

This table presents various robustness checks. In Panel A, we report the results of regressions using an alternative measure of CEO age, specifically the natural logarithm of CEO age. In Panel B, we show the results of regressions excluding the period of the global financial crisis. We use firm clustering to correct the standard errors. We winsorize continuous variables at the 1% and 99% levels. We report t-statistics in parentheses. The symbols ***, **, and * denote significance levels at the 1%, 5%, and 10% levels, respectively. We provide definitions of the variables in the Appendix.

Panel A: Alternative measure of CEO Age				
	(1)		(2)	
LNAGE	-0.2432 (-6.61)***		-0.1852 (-4.68)***	
PQMBA			0.4252 (9.07)***	
LNCEOTY			-0.0498 (-2.62)**	
Constant	-3.3476 (-6.72)***		-3.7673 (-7.94)***	
All controls	Included		Included	
Industry Effects	Yes		Yes	
Year Effects	Yes		Yes	
R ²	0.7153		0.7453	
F Stats	302.68		251.96	
Sample	4,826		3,840	
Panel B: Excluding Global Financial Crisis period (2007-2009)				
AGE	-0.8364 (-12.00)***		-0.5978 (-8.86)***	
PQMBA	0.5424 (11.69)***		0.4292 (9.05)***	
LNCEOTY			-0.0493 (-2.58)**	
Constant	-3.1471 (-6.36)***	-7.7931 (-32.62)***	-7.2038 (-30.02)***	-3.5421 (-7.44)***
All controls	Included	Included	Included	Included
Industry Effects	Yes	Yes	Yes	Yes
Year Effects	Yes	Yes	Yes	Yes
R ²	0.7075	0.7075	0.7236	0.7361
F Stats	297.28	337.43	218.83	247.47
Sample	3,734	3,734	2,698	2,698

TABLE 5: Firm Fixed Effects- The impact of CEO Characteristics on Business Strategy

This table reports the results on the robustness checks controlling for year, and firm fixed effects. We winsorize continuous variables at the 1% and 99% levels. We use firm clustering to correct the standard errors. We winsorize continuous variables at the 1% and 99% levels. We report t-statistics in parentheses. The symbols ***, **, and * denote significance levels at the 1%, 5%, and 10% levels, respectively. We provide definitions of the variables in the Appendix.

	1	2	3	4
<i>AGE</i>	-0.9317 (-7.18)***			-0.9916 (-6.75)***
<i>PQMBA</i>		0.6415 (9.20)***		0.542 (7.08)***
<i>LNCEOTY</i>			-0.0971 (-3.15)***	-0.0834 (-2.77)***
<i>LNTCEOREM</i>	-0.0059 (-0.28)	-0.011 (-0.52)	-0.019 (-1.03)	-0.0109 (-0.59)
<i>DEBTRATIO</i>	0.0302 (0.26)	0.0941 (0.81)	0.1902 (1.76)*	0.1475 (1.40)
<i>F1MO</i>	0.0337 (0.23)	0.0418 (0.29)	-0.0461 (-0.29)	-0.0829 (-0.52)
<i>LNTA</i>	0.3427 (10.82)***	0.4174 (13.86)***	0.3313 (10.91)***	0.2477 (7.86)***
<i>BIG4</i>	0.352 (4.67)***	0.3526 (4.80)***	0.384 (5.05)***	0.2941 (3.87)***
<i>BIND</i>	0.1702 (2.29)**	0.1482 (2.02)**	0.0772 (1.16)	0.0814 (1.25)
<i>LNAGEOFF</i>	-0.0973 (-1.54)	-0.0219 (-0.34)	-0.0457 (-0.66)	-0.0591 (-0.93)
<i>N0A1</i>	-0.5378 (-4.31)***	-0.3922 (-3.07)***	-0.2178 (-1.59)	-0.2241 (-1.79)*
<i>MKTBKR</i>	-0.009 (-1.05)	-0.008 (-0.93)	-0.0095 (-1.32)	-0.0059 (-0.85)
<i>ROA</i>	-0.0654 (-1.37)	0.1635 (2.72)***	0.0453 (1.69)*	-0.0956 (-1.97)*
<i>CONSTANT</i>	-0.3186 (-0.33)	-6.0267 (-10.82)***	-4.0848 (-7.15)***	1.6694 (1.63)
<i>Firm Effects</i>	Yes	Yes	Yes	Yes
<i>Year Effects</i>	Yes	Yes	Yes	Yes
<i>R2</i>	0.8848	0.8846	0.891	0.8991
<i>F</i>	182.00	175.18	79.45	101.06
<i>Sample</i>	4,826	4,826	3,840	3,840

TABLE 6: Two-stage least squares regression

this table presents 2SLS regression results of the impact of CEO Characteristics on Business Strategy using the heteroscedasticity -based instrument (Lewbel, 2012). We use firm clustering to correct the standard errors. We winsorize continuous variables at the 1% and 99% levels. We report t-statistics in parentheses. The symbols ***, **, and * denote significance levels at the 1%, 5%, and 10% levels, respectively. We provide definitions of the variables in the Appendix.

	1	2	3	4
<i>AGE</i>	-0.7576 (-10.96)***			-0.5459 (-8.10)***
<i>PQMBA</i>		0.5021 (10.82)***		0.3971 (8.42)***
<i>LNCEOTY</i>			-0.0463 (-2.38)**	-0.0460 (-2.45)**
<i>LNTCEOREM</i>	-0.0112 (-0.54)	-0.0202 (-0.99)	0.0282 (1.48)	0.0209 (1.13)
<i>DEBTRATIO</i>	0.5420 (2.18)**	0.9936 (2.76)***	1.4781 (2.28)**	1.1250 (2.28)**
<i>F1MO</i>	0.1464 (1.37)	0.1685 (1.69)*	0.1030 (0.93)	0.0391 (0.34)
<i>LNTA</i>	0.4184 (29.41)***	0.4678 (36.77)***	0.4130 (32.15)***	0.3645 (26.75)***
<i>BIG4</i>	0.1743 (4.21)***	0.2054 (4.78)***	0.1724 (4.27)***	0.1557 (4.01)***
<i>BIND</i>	-0.0223 (-0.33)	0.0024 (0.03)	0.0769 (1.15)	0.0573 (0.89)
<i>LNAGEOFF</i>	0.0745 (3.94)***	0.0398 (2.13)**	0.0324 (1.77)*	0.0444 (-2.50)**
<i>N0A1</i>	-0.4758 (-5.07)***	-0.4461 (-5.09)***	-0.3472 (-3.36)***	-0.3206 (-3.23)***
<i>MKTBKR</i>	-0.0007 (-0.11)	0.0027 (0.47)	0.0002 (0.06)	0.0006 (0.11)
<i>ROA</i>	-0.0757 (-1.63)	0.1498 (2.42)**	0.0282 (1.14)	-0.1075 (-1.69)*
<i>CONSTANT</i>	-2.8406 (-5.76)***	-7.0332 (-29.47)***	-6.5007 (-27.07)***	-3.1965 (-6.75)***
<i>Industry Effects</i>	Yes	Yes	Yes	Yes
<i>Year Effects</i>	Yes	Yes	Yes	Yes
<i>R2</i>	0.7254	0.7261	0.7398	0.7543
<i>F</i>	317.54	342.98	232.65	246.87
<i>Sample</i>	4,826	4,826	3,840	3,840

Table 7: PSM Analysis

Table 4 shows the average treatment effects obtained from propensity score matching. Firms with CEO Characteristics (above yearly industry median) are our treatment firms, whereas firms with CEO Characteristics are our control firms. Panel B presents the results based PSM regression. Continuous variables are winsorized at the 1% and 99% levels. We use firm clustering to correct the standard errors in the regression. We use year, industry fixed effects in the regression. We report t-statistics in parentheses. The symbols ***, **, and * denote significance levels at the 1%, 5%, and 10% levels, respectively. We provide definitions of the variables in the Appendix.

Panel A: Propensity score matching			
	Treatment	Control	t- test
<i>LNTCEOREM</i>	13.105	13.177	-0.910
<i>DEBTRATIO</i>	0.334	0.359	-1.170
<i>F1MO</i>	0.014	0.025	-0.910
<i>LNTA</i>	18.302	18.237	0.440
<i>BIG4</i>	0.559	0.520	0.930
<i>BIND</i>	0.434	0.433	0.070
<i>LNAGEOFF</i>	2.410	2.316	1.170
<i>N0A1</i>	0.978	0.978	0.000
<i>MKTBKR</i>	2.805	2.970	-0.580
<i>ROA</i>	0.0212	0.0221	0.987
Panel B: PSM Regression			
	1	2	3
<i>AGE</i>	-0.9168 (-5.45)***		
<i>PQMBA</i>		-0.5763 (-4.02)***	
<i>LNCEOTY</i>			-0.0858 (-3.40)***
<i>Constant</i>	-4.9471 (-5.77)***	-8.6871 (-35.48)***	-4.1432 (-3.91)***
<i>All controls</i>	Included	Included	Included
<i>Industry Effects</i>	Yes	Yes	Yes
<i>Year Effects</i>	Yes	Yes	Yes
<i>R²</i>	0.6996	0.7056	0.7123
<i>F Stats</i>	169.34	169.34	234.98
<i>Sample</i>	661	661	480

Table 8: The impact of CEO Characteristics on Business Strategy : Lagged Variables

This table presents the regression results on the impact of lagged CEO characteristics on business strategy. The dependent variable, *BSIA*, represents the strategy score as defined by Bentley et al. (2013). We use *AGE*, *PQMBA* and *LNCEOTY* as measures of CEO characteristics. We use firm clustering to correct the standard errors. We winsorize continuous variables at the 1% and 99% levels. We report t-statistics in parentheses. The symbols ***, **, and * denote significance levels at the 1%, 5%, and 10% levels, respectively. We provide definitions of the variables in the Appendix.

	1	2	3	4
<i>AGE</i>	-1.121 (-14.32)***			-0.804 (-10.38)***
<i>PQMBA</i>		0.6448 (13.10)***		0.5097 (10.32)***
<i>LNCEOTY</i>			-0.0784 (-3.92)***	-0.0704 (-3.70)***
<i>LNTCEOREM</i>	0.0552 (2.64)***	0.0538 (2.60)***	0.0942 (4.79)***	0.0788 (4.25)***
<i>DEBTRATIO</i>	0.2224 (2.82)***	0.3114 (3.80)***	0.2327 (2.95)***	0.1871 (2.54)**
<i>F1MO</i>	0.2354 (2.28)**	0.2863 (3.01)***	0.1404 (1.34)	0.0819 (0.76)
<i>LNTA</i>	0.4363 (29.99)***	0.4995 (40.06)***	0.4588 (36.93)***	0.394 (27.46)***
<i>BIG4</i>	0.2292 (5.49)***	0.2813 (6.42)***	0.218 (5.46)***	0.1914 (4.98)***
<i>BIND</i>	-0.1134 (-1.66)*	-0.096 (-1.40)	0.0271 (0.40)	0.0067 (0.10)
<i>LNAGEOFF</i>	0.0838 (4.35)***	0.0364 (1.89)*	0.0328 (1.74)*	0.0519 (2.89)***
<i>N0A1</i>	-0.6935 (-7.25)***	-0.6709 (-7.56)***	-0.5025 (-4.83)***	-0.4542 (-4.60)***
<i>MKTBKR</i>	-0.0001 (-0.01)	0.0047 (0.81)	-0.0006 (-0.11)	0.0015 (0.29)
<i>ROA</i>	-0.0732 (-1.73)*	0.1437 (2.87)***	0.0426 (1.54)	-0.1468 (-2.43)**
<i>CONSTANT</i>	-2.0042 (-3.79)***	-8.1006 (-36.07)***	-7.7244 (-34.29)***	-2.9738 (-5.70)***
<i>Industry Effects</i>	Yes	Yes	Yes	Yes
<i>Year Effects</i>	Yes	Yes	Yes	Yes
<i>R2</i>	0.7108	0.7075	0.7276	0.7462
<i>F</i>	429.86	424.01	310.45	368.81
<i>Sample</i>	3,854	3,854	2,947	2,947

Table 9: The impact of CEO Characteristics on Firm Performance

This table presents the regression results on the impact of CEO characteristics on firm performance. The dependent variable is *firm performance*, which is the Return on Assets (ROA). We use *AGE*, *PQMBA* and *LNCEOTY* as measures of CEO characteristics. We use firm clustering to correct the standard errors. We winsorize continuous variables at the 1% and 99% levels. We report t-statistics in parentheses. The symbols ***, **, and * denote significance levels at the 1%, 5%, and 10% levels, respectively.

	1	2	3	4
<i>AGE</i>	-0.0854 (-3.50)***	-0.0789 (-2.87)***	-0.0936 (-3.69)***	-0.1248 (-4.64)***
<i>PQMBA</i>		0.0357 (2.97)***		0.0377 (3.19)***
<i>LNCEOTY</i>			0.0998 (5.63)***	0.0968 (4.91)***
<i>AGE * PQMBA</i>		-0.0939 (-2.80)***		-0.0861 (-2.32)**
<i>AGE * LNCEOTY</i>			-0.1185 (-3.35)***	0.0912 (-2.92)***
<i>LNTCEOREM</i>	-0.0321 (-4.03)***	-0.0337 (-4.74)***	-0.0303 (-3.82)***	-0.0335 (-4.43)***
<i>DEBTRATIO</i>	-0.2645 (-6.65)***	-0.2097 (-6.21)***	-0.2496 (-6.23)***	-0.2396 (-6.60)***
<i>F1MO</i>	-0.0374 (-1.39)	-0.0504 (-2.77)***	-0.0353 (-1.32)	-0.0586 (-2.49)**
<i>LNTA</i>	0.0677 (10.89)***	0.0657 (12.70)***	0.0632 (10.27)***	0.0658 (11.76)***
<i>BIG4</i>	0.0146 (0.94)	0.0061 (0.57)	0.0131 (0.87)	0.0127 (0.84)
<i>BIND</i>	-0.0083 (-0.40)	-0.0169 (-0.92)	-0.0073 (-0.36)	-0.0248 (-1.26)
<i>LNAGEOFF</i>	0.0102 (1.74)*	0.0072 (1.47)	0.0098 (1.66)	0.0119 (1.81)*
<i>N0A1</i>	-0.0464 (-2.16)**	-0.0181 (-0.96)	-0.0438 (-2.02)**	-0.0445 (-2.08)**
<i>MKTBKR</i>	0.0081 (3.40)***	0.0024 (0.98)	0.0076 (3.26)***	0.0079 (3.28)***
<i>CONSTANT</i>	-0.9010 (-9.34)***	-0.8553 (-10.56)***	-0.8505 (-8.82)***	-0.8242 (-8.93)***
<i>Industry Effects</i>	Yes	Yes	Yes	Yes
<i>Year Effects</i>	Yes	Yes	Yes	Yes
<i>R2</i>	0.2754	0.2686	0.2754	0.3311
<i>F</i>	16.33	21.08	16.33	17.68
<i>Sample</i>	2,814	3,788	2,814	2,814

Table 10: Probit Regression Results on the Impact of CEO Characteristics on Business Strategy

This table presents the Probit regression results on the impact of CEO characteristics on business strategy, classified as dummy variables. Panel A represents the Prospector strategy dummy as the dependent variable, Panel B represents the Analyzer strategy dummy (Hybrid) as the dependent variable, and Panel C represents the Defender strategy dummy as the dependent variable. For our analysis, firms are classified based on their scores: firms scoring 6–12 belong to the Defender subset, those scoring 13–23 are classified as Analyzers, and firms scoring 24 or above are categorized as Prospectors. We use *AGE*, *PQMBA*, and *LNCEOTY* as measures of CEO characteristics. To ensure robust standard errors, we apply firm clustering. Continuous variables are winsorized at the 1% and 99% levels to mitigate the influence of outliers. t-statistics are reported in parentheses. The symbols ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively. Variable definitions are provided in the Appendix. write table heading

Panel A: Probit Regression Results for the Prospector Strategy Dummy				
	1	2	3	4
<i>AGE</i>	-0.3531 (-5.18)***			-0.2547 (-3.78)***
<i>PQMBA</i>		0.2344 (4.87)***		0.1851 (3.99)***
<i>LNCEOTY</i>			-0.0494 (-2.59)***	-0.0498 (-2.67)***
<i>CONSTANT</i>	-6.4392 (-13.03)***	-8.9107 (-18.62)***	-8.7364 (-17.76)***	-7.2461 (-15.35)***
<i>Industry Effects</i>	Yes	Yes	Yes	Yes
<i>Year Effects</i>	Yes	Yes	Yes	Yes
<i>Pseudo R2</i>	0.4185	0.4180	0.4068	0.4346
<i>Sample</i>	4,826	4,826	3,840	3,840
Panel B: Probit Regression Results for the Analyzer Strategy Dummy				
<i>AGE</i>	-0.1263 (-2.38)**			-0.0911 (-2.128)**
<i>PQMBA</i>		0.0834 (1.98)**		0.0661 (1.69)*
<i>LNCEOTY</i>			-0.0193 (-1.79)*	-0.0208 (-1.87)*
<i>CONSTANT</i>	-5.7002 (-11.55)***	-7.5063 (-17.76)***	-6.5448 (-17.13)***	-6.2178 (-15.65)***
<i>Industry Effects</i>	Yes	Yes	Yes	Yes
<i>Year Effects</i>	Yes	Yes	Yes	Yes
<i>Pesudo R2</i>	0.4057	0.4039	0.4021	0.4189
<i>Sample</i>	4,826	4,826	3,840	3,840
Panel C: Probit Regression Results for the Defender Strategy Dummy				
<i>AGE</i>	0.2534 (3.32)***			0.2144 (3.15)***
<i>PQMBA</i>		-0.2342 (-3.02)***		-0.1854 (-2.89)***
<i>LNCEOTY</i>			0.0217 (1.11)	0.0213 (1.03)
<i>CONSTANT</i>	5.3994 (10.93)***	6.8001 (13.86)***	6.1803 (11.13)***	6.0983 (11.09)***
<i>Industry Effects</i>	Yes	Yes	Yes	Yes
<i>Year Effects</i>	Yes	Yes	Yes	Yes
<i>Pesudo R2</i>	0.3876	0.3849	0.3817	0.3982
<i>Sample</i>	4,826	4,826	3,840	3,840

