

# Engineer CEOs and corporate risk taking

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## Abstract

**Purpose** – This study aims to examine whether engineer chief executive officers (CEOs) influence corporate risk-taking behaviour. We further examine the corporate characteristics that facilitate this association.

**Design/methodology/approach** – We argue that engineer CEOs have unique skills and access to technical and/or technological social circles, increasing their self-confidence in decision-making. Using upper echelon and imprint theories, we hypothesise a positive association between engineer CEOs and corporate risk-taking. We hand-collected data of engineer CEOs in a sample of Australian listed firms from 2015 to 2022, and corporate risk-taking is measured based on stock return volatility and return on asset volatility over three overlapping years. The hypothesis is examined using regression analysis, followed by robustness tests.

**Findings** – The analysis indicates a positive association between engineering CEOs and corporate risk-taking. The results are robust to fixed effect regressions, propensity score matching, accounting for residuals of the engineer CEO variable, and two-stage least squares (2SLS) methods. We traced sources of corporate risk-taking, finding that financial leverage and sales growth facilitate risky investments.

**Practical implications** – The results present implications for the literature, corporate leaders, investors and regulators in understanding the role of CEOs' technical expertise in determining corporate risk appetite. The results are insightful for stakeholders by revealing that engineer CEOs increase the corporate risk profile.

**Originality/value** – This paper reveals that engineering CEOs increase corporate risk profiles, showing the importance of considering the specific expertise of leaders independently in understanding corporate risk-taking behaviour.

**Keywords** Corporate strategy, CEO characteristics, Corporate risk taking, Engineering CEO, Organisational policies

**Paper type** Research paper

## JEL Classification — D81, G32, G34, D23

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## 1. Introduction

Known for their stubbornness, especially when things aren't working like they're supposed to, they'll keep trying new methods and coming up with creative and innovative strategies until it does work (Leonard de Vinci Graduate School of Engineering, 2021, p. 6)

This paper examines whether engineering chief executive officers (CEOs) influence corporate risk-taking behaviour. Executive leadership in the corporate world has traditionally been dominated by individuals with expertise in accounting, finance, and law. However, a growing trend is the emergence of CEOs with technical expertise, particularly those with engineering backgrounds. For instance, in 2018, engineering was identified as the most common field of expertise among top-performing Fortune 500 CEOs, representing 34% of this group (Thanh, 2023). Engineering CEOs are distinct from their counterparts due to their technical problem-solving skills, unique professional networks of technical experts, and confidence derived from their specialised education (Ting *et al.*, 2021).

Prior research highlights that CEOs' characteristics such as age, gender, political connections, and technical expertise, such as engineering or science, drive corporate innovation (Ting *et al.*, 2021), foster green innovation (Zeb *et al.*, 2024), and enhance outcomes in digital transformation (Kong *et al.*, 2023). They are associated with higher R&D expenditure (Jaggia and Thosar, 2021). However, the role of engineering-trained CEOs in shaping *corporate risk-taking* remains underexplored. This is a significant gap in the literature, given that risk-taking forms a cornerstone of corporate strategy and is critical to long-term success. Engineering CEOs, with their technical expertise and innovative capabilities, may encourage risk-taking as part of strategic decision-making. Conversely, heightened scrutiny from investors and stakeholders may compel them to adopt more conservative approaches, prioritising stability and career security over bold initiatives. Understanding how engineering CEOs navigate this balance between innovation and caution provides important insights into the interplay between leadership characteristics and corporate risk-taking.

This study uses Upper Echelons theory (UET) and Imprint theory. UET posits that corporate decisions are shaped by the characteristics of decision-makers, particularly top executives (Hambrick and Mason, 1984). Imprint theory suggests that early life experiences leave enduring cognitive and behavioural imprints that influence future decision-making (Xu, 2023; Marquis and Tilcsik, 2013). Applying these perspectives, we argue that Engineering CEOs, who often develop their early careers through problem-solving, technical innovation, and calculated risk-taking roles (El-Zein and Hedemann, 2016), carry imprints of these traits into their leadership. These imprints may increase their propensity to undertake calculated high-risk projects. Moreover, their access to unique social networks and advanced technical knowledge further enhances their confidence in making strategic decisions under uncertainty.

Using a sample of Australian Securities Exchange (ASX) 200 firms from 2015 to 2022, we find a significant positive association between engineering-trained CEOs and corporate risk-taking, measured through stock return volatility and ROA volatility. We conduct several robustness tests to address potential endogeneity concerns, including year and industry fixed effects, propensity score matching (PSM) regression, accounting for the residual effects of engineer CEOs, and the two-stage least squares (2SLS) method. The results remain consistent with alternative estimators, different clustering of standard errors, and alternative scaling of the corporate risk-taking measures. To further explore how engineer CEOs implement risk-taking strategies, we investigate whether financial leverage and annual sales growth facilitate these decisions. The additional analyses reveal that corporate risk-taking is significantly higher in firms with higher leverage and sales growth when led by engineer CEOs. These findings suggest that engineer CEOs are more willing to take risks in firms with greater debt levels and higher sales growth. Additionally, we conduct a subsample analysis focusing on highly technical industries, showing that engineering expertise more influential in these industries.

Certain prior research has examined the influence of the engineering or science expertise of CEOs on corporate risk-taking under broad investigations of CEO characteristics. However,

these studies do not provide strong theoretical arguments for the link between engineering expertise and risk-taking. We believe that the influence of the engineering expertise of CEOs and its impact on corporate risk profile is under-researched yet worth investigating. Our study is different from prior studies in several ways. First, prior studies on this phenomenon do not indicate significant associations between engineering CEOs and corporate risk-taking. [Frag and Chris \(2018\)](#) find no associations between CEOs' professional experience (including science and engineering) and corporate risk-taking in a sample of Chinese listed firms. Focusing on a sample of firms in [France et al. \(2023\)](#) find that CEOs with an engineering or science education are associated with liquidity risk; however, they find no association between engineer CEOs and commonly applied market-based performance measures of risk-taking (e.g. stock return volatility). These results may be driven by contextual factors (e.g. the nature of the sample). For instance, [Frag and Chris \(2018\)](#) use a sample of Chinese firms with initial public offerings (IPOs) where most firms are state-owned; thus, the findings are not generalisable to other contexts. Thus, it is insightful to investigate whether engineering CEOs influence corporate risk-taking in other contexts. Our study extends this line of literature with contrasting results to prior literature, showing that engineer CEOs increase corporate risk-taking in terms of accounting-based returns and market-based returns in the Australian context.

Second, we believe that examining the influence of engineering CEOs on corporate outcomes in the Australian context provides new insights into the literature. A large proportion of Australian top-listed firms are from industries in which engineering expertise may be more desirable ([Weerasinghe et al., 2024, #438](#)). For example, 20% of firms in the top 300 listed firms are from the metal and mining sector, which is a key contributor to the country's economy as it is the largest global producer of lithium nickel ([The International Trade Administration, 2021](#); [Rumokoy et al., 2023](#)). The engineering expertise of top leadership of firms is essential to such industries with highly technical and risky operations. Lastly, prior research considers the impact of engineering CEOs on risk-taking as part of investigating broad CEO characteristics and less theoretical arguments have been developed to argue the importance of engineering expertise. For the same reason, the results of no association between engineer CEOs and risk-taking have not been deeply explored. In contrast, our research focuses on engineering CEOs as a unique influencing characteristic on risk-taking with strong theoretical arguments and the explanation of the results with additional analyses. For instance, we show that engineer CEOs' influence on risk-taking is more pronounced in firms with higher sales growth and leverage.

Our study contributes to the literature in three ways. We contribute to the literature examining the link between CEO characteristics and corporate risk-taking ([Faccio et al., 2016](#); [Cain and McKeon, 2016](#); [Sun et al., 2023](#)), by showing that the engineering expertise of CEOs influences risk-taking behaviour. While certain prior research has examined this phenomenon in other contexts (e.g. China and France), these indicate no influence of engineering expertise on corporate risk-taking based on performance measures. Further, prior research on this topic is highly contextual and broadly examines the influence of CEO characteristics on risk-taking ([Frag and Chris, 2018](#); [Loukil and Yousfi, 2023](#)). We provide contrasting results to prior studies using a sample of Australian firms showing that higher risk-taking behaviour of firms is evident through the volatility of returns in firms managed by engineer CEOs.

Our results contribute to the limited research examining the technical expertise of CEOs in influencing corporate outcomes ([Weerasinghe and Dissanayake, 2024](#); [Ting et al., 2021](#); [Zeb et al., 2024](#)). While these studies highlight the role of technical backgrounds in fostering innovation and investment decisions, our research demonstrates that engineering expertise is a critical determinant of corporate risk-taking behaviour. This underscores the importance of considering CEOs' technical expertise as an independent and influential factor when analysing corporate strategies, especially in risk-intensive industries. Lastly, we provide evidence from an Australian-listed firm sample, a context with a higher proportion of firms characterised by high technical complexity and operational risks (e.g. 20% of the top 300 firms are metals and mining) ([Weerasinghe and Dissanayake, 2024](#)). Our additional analysis reveals that the impact

of the engineering expertise of CEOs on risk-taking is more pronounced in certain sectors with higher technical operations and risk.

We provide two main contributions to corporate practice. Our results indicate that structuring top leadership with engineering expertise increases corporate risk-taking behaviour. This will be useful for firms pursuing pathways to increase their risk-taking behaviour, which is an essential strategy for innovation and growth. Firms can strengthen their talent pipelines to navigate engineers into executive leadership roles to achieve these objectives. Our results will be interesting to investors in understanding the risk profile of firms by looking at the top leadership technical expertise and making informed investing decisions, particularly in risky industries, such as metals and mining.

The remainder of this paper is developed as follows: [Section 2](#) reviews the related literature in developing the [H1](#), followed by [Section 3](#) describing the methodology. [Section 4](#) provides empirical results, followed by [Section 5](#) discussing the results. The paper concludes with [Section 6](#).

## 2. Literature review and hypotheses development

### 2.1 CEO characteristics and corporate risk taking

In ideal capital markets, corporate leaders should prioritise maximising the market value of firms, thereby implying that individual characteristics should not impact risk-taking decisions ([Faccio et al., 2016](#)). However, in practice, there is ample evidence that CEO characteristics are important in shaping corporate decisions, resonating upper-echelon theory (UET). UET proposes that corporate outcomes/behaviour reflect its top-echelon characteristics and ethics ([Hambrick and Mason, 1984](#); [Le et al., 2022](#); [Song et al., 2021](#); [Weerasinghe et al., 2023](#)). Research indicates that CEO characteristics such as gender, ethics, education, training, and experience play pivotal roles in shaping their analytical and psychological capabilities; thus, resulting in differential influence on corporate policies ([Bernile et al., 2018](#); [Huang et al., 2024](#); [Song et al., 2021](#); [Weerasinghe et al., 2024](#)). Managers gather expertise and understanding through previous training and employment, including military service ([Benmelech and Frydman, 2015](#)), international exposure ([Yuan and Wen, 2018](#)), as well as flight experience ([Cain and McKeon, 2016](#); [Sun et al., 2023](#)). A common conceptual rationale of research focuses on CEO behavioural characteristics is that their early life experiences and education imprint as persisting features of their decision-making ([Xu, 2023](#); [Marquis and Tilcsik, 2013](#); [Yeoh and Hooy, 2022](#)). For instance, military service consists of a series of training programs that emphasise responsibility, dedication, and self-sacrifice, which lead officers to develop leadership and decision-making skills under pressure ([Benmelech and Frydman, 2015](#)). CEOs with military experience act ethically and make conservative corporate decisions, resulting in less investment and less fraud ([Benmelech and Frydman, 2015](#)).

Specific to corporate risk-taking, research indicates that corporate risk-taking behaviour is significantly influenced by CEO characteristics ([Cid-Aranda and López-Iturriaga, 2023](#)). CEO foreign experience is an insightful phenomenon that imprints certain characteristics influencing their risk appetite in corporate decision-making. CEOs with foreign experience are equipped with problem-solving, tolerant to failures, and risk-taking abilities; thus, resulting in undertaking risky projects ([Sun et al., 2023](#)). Corporate risk-taking is higher when CEOs are generalists (with general managerial skills rather than being a specialist) because they are less afraid of taking risks, as evidenced in diversifying their career progression ([Leng and Pan, 2023](#); [Brockman et al., 2016](#)). Further, CEOs with pilot licences (as a proxy for personal risk-taking) increase corporate risk-taking ([Cain and McKeon, 2016](#)). In contrast, female CEOs are more risk-averse and adopt less risky corporate investments ([Faccio et al., 2016](#)). Similarly, research indicates that CEO inside debt is negatively associated with corporate risk-taking ([Sheikh et al., 2017](#)).

### 2.2 Engineer CEOs and corporate risk-taking

CEOs with engineering experience have demonstrated their ability to drive corporate success in the contemporary business world ([Jiang et al., 2023](#)). Successful global corporations such as Apple, Amazon, Google, IBM, Microsoft, Shell, General Motors, and Dow Chemical are driven

by engineer CEOs (Jiang *et al.*, 2023). Prior research indicates that engineering CEOs increase corporate innovation, research and development, and technology transformation (Zeb *et al.*, 2024; Ullah *et al.*, 2024). Managers with engineering expertise contribute to firms by transferring knowledge and skills, thereby enhancing firm value and performance (Zeb *et al.*, 2024).

Several characteristics of engineering CEOs are distinct from those of other CEOs that can potentially influence their risk appetite. First, engineers inherently possess the attributes requisite for CEO roles, as they embody qualities integral to effective leadership, including exceptional problem-solving skills and a unique aptitude for risk management (Zeb *et al.*, 2024; Ullah *et al.*, 2024). Education in a highly technical aspect like engineering is likely to strengthen individuals' ability to conduct advanced searches, precise calculations, and rational solutions to problems (Litzinger *et al.*, 2011). Individuals who studied engineering encounter numerous mathematical challenges throughout their university education, improving self-confidence (Parsons *et al.*, 2011) and resonating with increased self-efficacy (Bandura *et al.*, 1999). Heightened self-efficacy can influence an individual's risk-taking propensity (Densberger, 2014). Second, Engineer CEOs are likely to be in a distinct social circle of technical experts, which may facilitate them to discover new technological trends (Ullah *et al.*, 2024) and cultivate strong technological skills (Ting *et al.*, 2021). This is because there is a potential spillover of technical/technological knowledge within these social networks (Zeb *et al.*, 2024; Ullah *et al.*, 2024). Heightened technological skills and access to unique social circles can increase CEO confidence, potentially influencing their risk appetite positively. This is because they are better equipped to navigate technological changes in the market compared to other CEOs, making them more inclined to take risks.

The above review suggests the abilities of engineering CEOs in handling complex problems, gathering knowledge from their unique social circles, skills in technology, and calculated risk-taking that may lead them to be confident in their decisions in investment projects they undertake. For example, high access to social circles of technical expertise may facilitate them to be confident in making their technological investment decisions. These characteristics of engineer CEOs potentially influence their risk appetite positively and make them less risk averse. Therefore, we posit that engineering CEOs, benefiting from their background in rigorous mathematical training, are predisposed to being more comfortable with risk-taking and their unique skills and networks may facilitate a positive risk-taking appetite in corporate investments, leading to the following H1:

- H1. Firms managed by engineer CEOs will take higher risks than those managed by non-engineering CEOs.

### 3. Data and methodology

#### 3.1 Sample and empirical equation

The initial sample began with ASX 200 listed firms from 2015 to 2022, equalling 1,600 firm-year observations. We exclude financial firms due to different regulatory environments and risks associated with the industry. Due to data hand-collection of engineer CEOs variable and the exclusion of missing data of control variables, the final sample was left with 1,027 firm-year observations. Our sample size is consistent with other studies examining corporate risk-taking in the Australian context.

All explanatory variables are winsorized at the 1st and 99th percentile to adjust outliers and lagged by one year ( $t-1$ ) to minimise reverse causality concerns. Variable descriptions are outlined in Table 1 and discussed below. The following regression equation is used with ordinary least squares (OLS) regression to test our H1. All explanatory variables are lagged by one year ( $t-1$ ) to minimise the concern of reverse causality, and we include year and industry-fixed effects in all regressions to account for endogeneity. In the additional analyses (Section 4.3.3), we use different methods clustering of standard errors (firm, industry, and year-industry) to account for the within-cluster correlations.

**Table 1.** Variable definitions

Variable	Measurement	Source
<i>Risk taking</i>		
SRV	Annualised Standard deviation of Monthly Stock Returns	EIKON
ROAV	Standard deviation of ROA over 3 years	EIKON
<i>Engineering CEO</i>		
EngCEO	Dummy that is equal to 1 if a firm is managed by an engineer CEO each year and 0 otherwise	Hand-collected
<i>Firm characteristics</i>		
ROA	Net Income/Total Assets	Morningstar
FirmSize	Natural logarithm of total assets	Morningstar
Leverage	Long + Short Term Debt/(Total Capital + Short Term Debt)*100	Morningstar
CAPEX	Capital expenditure/operating revenue	Morningstar
SalesGrowth	The number of years listed in ASX	Morningstar
<i>Panel C: corporate governance and monitoring variables</i>		
BEng	Percentage of engineer directors on boards	Hand-collected
BSize	The total number of board members at the end of the fiscal year	EIKON
BInd	Percentage of non-executive board members	EIKON
<i>Panel D: CEO characteristics variables</i>		
CEOGender	Binary variable, equal to 1 if the CEO is Male and 0 if the CEO is Female	Connect4
CEODuality	Binary variable, equal to 1 if the CEO is also the Chair and 0 otherwise	EIKON
<b>Source(s):</b> Authors' own work		

Model 1: Engineer CEOs and corporate risk-taking

$$\begin{aligned}
 \text{Corporate Risk Taking} = & \alpha + \beta_1 \text{EngCEO}_{-i,t-1} + \beta_2 \text{BEng}_{i,t-1} + \beta_3 \text{BSize}_{i,t-1} \\
 & + \beta_4 \text{BInd}_{i,t-1} + \beta_5 \text{ROA}_{i,t-1} + \beta_6 \text{FirmSize}_{i,t-1} \\
 & + \beta_7 \text{Leverage}_{-i,t-1} + \beta_8 \text{CAPEX}_{-i,t-1} + \beta_9 \text{SalesGrowth}_{-i,t-1} \\
 & + \beta_{10} \text{CEOGender}_{i,t-1} + \beta_{11} \text{CEODuality}_{i,t-1} \\
 & + \text{Year \& Industry Fixed} + \varepsilon_{i,t}
 \end{aligned}$$

3.2 Variables measures

3.2.1 *Corporate risk taking.* We employed two proxies of corporate risk-taking following prior literature. The first is focused on market-based returns and the second is accounting-based returns. Our primary measure of corporate risk-taking is the volatility of stock returns (SRV). SRV is measured based on the annualised monthly standard deviations of stock returns. Firms with high return volatility are riskier than firms with low return volatility. We favour this measure because the accounting measures of risk-taking could be subjected to manipulations. We use the accounting returns as the second proxy, the volatility of return on assets (ROA) over three years (Risk). ROA is the ratio of earnings to total assets in firms and ROA volatility is measured based on the standard deviation of firms from the contemporary year to two succeeding years [1]. The intuition is that high-risk corporate operations can lead to high earnings volatility and the use of ROA volatility in overlapping periods is consistent with prior accounting and finance research (Sun et al., 2023).

3.2.2 *Engineer CEOs.* In the Australian context, data on CEOs' or directors' qualifications and work experience are not directly available through data repositories. To address this, we manually collect this information by reviewing annual report biographies of the sample firms,

accessed via the Thomson Reuters Connect4 database. We begin by conducting a keyword search (e.g. “enginee\*”, “BEng\*”, and “BSc Eng\*”) within the annual report biographies to identify relevant reports. These reports are then manually reviewed by two independent researchers to identify and reconcile any discrepancies. For verification, once an engineer CEO or director is identified in a specific firm-year, the classification is cross-checked with data from preceding and succeeding years for consistency. The variable Engineer CEO (EngCEO) is a binary indicator that equals 1 if a firm is managed by an engineer CEO each year and 0 otherwise.

**3.2.3 Control variables.** Control variables are included at three levels: firm, governance, and CEO characteristics, following prior related research (Faccio *et al.*, 2016; Cain and McKeon, 2016; Sun *et al.*, 2023; Dissanayake *et al.*, 2021, 2022). Firm-level controls include return on assets (ROA), Firm size (FirmSize), Leverage, capital expenditure (CAPEX), and annual sales growth (SalesGrowth). Governance and board variables include board size, (BSize), independence (Bind), and the percentage of engineering directors on boards (BEng). We control for CEO duality and gender. Year and industry (GICS) fixed effects are included. All variable descriptions and provided in Table 1.

## 4. Main results

### 4.1 Descriptive statistics

Summary statistics are provided in Table 2 with mean, range, and standard deviation of variables. In our sample, 12% of firms are managed by engineer CEOs and the average percentage of engineer directors on boards is 7%. The average SRV is 0.10, with a standard deviation of 0.07, indicating moderate variability in stock returns. The maximum SRV observed is 0.93, reflecting substantial fluctuations in some firms’ stock prices. The average ROAV is 0.05, with a standard deviation of 0.11, indicating variability in firms’ profitability relative to their assets. The maximum ROAV observed is 1.36, showing high variability in some cases. Among the control variables, on average, board size is 7, independence is 70%, ROA is 0.05, the natural logarithm of total assets is 21.48, leverage is 2.24, capex is 2.75, and annual sales growth is 0.15 in the sample. Annual sales growth averages 0.15, indicating moderate growth across the sample. CEO gender diversity is low, with only 5% of CEOs being female. CEO duality is observed in 7% of firms, where the CEO serves as the board chair. We examine variable correlations, revealing that multicollinearity threat is minimal with coefficients ranging from 0 to 0.6 (Tabachnick and Linda, 2013) (Appendix). The highest significant correlation is between board size and firm size (0.54), expectedly.

**Table 2.** Descriptive statistics

Variables	Mean	Std. dev	Minimum	Maximum
SRV	0.10	0.07	0.00	0.92
ROAV	0.05	0.11	0.00	1.36
EngCEO	0.12	0.33	0.00	1.00
BEng	0.07	0.14	0.00	0.80
BSize	7.38	1.70	4.00	12.00
BInd	70.77	19.24	0.00	100.00
ROA	0.49	0.15	-0.80	0.37
FirmSize	21.48	1.84	16.00	25.00
Leverage	2.24	1.61	1.04	12.34
CAPEX	2.75	19.87	0.00	176.83
SalesGrowth	0.15	0.45	-0.66	3.20
CEOGender	0.48	0.22	0.00	1.00
CEODuality	0.69	0.24	0.00	1.00

**Source(s):** Authors’ own work

4.2 Engineer CEOs and corporate risk-taking

Table 3 reports the results of OLS regression in testing the hypothesised association between engineer CEOs and corporate risk-taking proxies. The equations indicate *r*-squared values of 24 and 32%, indicating the variations of the risk-taking measures explained by variables. The results indicate support for the H1, with a significant positive association between engineer CEOs and SRV ( $\beta = 0.011, p < 0.10$ ) and ROAV ( $\beta = 0.014, p < 0.10$ ). This suggests firms managed by engineer CEOs have higher risk-taking behaviour in the form of stock and accounting return volatility compared to firms without engineer CEOs. The economic significance of these associations is estimated based on the coefficients and the means of the risk proxies. This indicates that on average, firms with engineer CEOs have 11% higher stock return volatility compared to other firms, indicating that the association is economically significant. The percentage of engineer directors on the board (BEng) is positively associated with risk-taking, with significant effects on SRV ( $\beta = 0.036, p < 0.05$ ) and ROAV ( $\beta = 0.039, p < 0.10$ ).

The results concerning other control variables are mostly consistent with prior studies. ROA is significant and negatively associated with risk-taking, resonating with the notion that less profitable firms are likely to take more risk (Faccio et al., 2016; Sun et al., 2023). Firm leverage is significant and positively associated with risk-taking, indicating that leverage is used to invest in riskier projects (Boubakri et al., 2013). Similarly, sales growth has a significant positive association with risk-taking, echoing that it is an incentive for managers to make risky investments (Tsai and Luan, 2016). Board size and independence have no significant impact on SRV but are strongly associated with ROAV. CEO characteristics are non-significant except for CEO duality with ROAV.

4.3 Discussion and additional analyses

The main analysis indicates a significant positive association between engineer CEOs and corporate risk-taking, consistent with our H1. Two leading arguments for this association can be drawn from the literature. First, engineer CEOs are likely to be equipped with a set of unique skills, such as problem-solving, handling complex problems, technical and technological skills, and attention to detail (Zeb et al., 2024; Ullah et al., 2024; Litzinger et al., 2011); thus, they are distinct from other CEOs in terms of their skills and expertise. These characteristics are likely to increase their self-confidence (Parsons et al., 2011; Bandura et al., 1999) in

Table 3. Engineer CEOs and corporate risk-taking

Parameter	SRV (1)	ROAV (2)
Intercept	0.372	0.425
EngCEO	0.011* (1.75)	0.014** (2.25)
BEng	0.036** (2.27)	0.039* (1.85)
BSize	-0.001 (-1.25)	0.009*** (5.25)
BInd	0.000 (-0.15)	0.000** (2.46)
ROA	-0.116*** (-8.58)	-0.266*** (-14.51)
FirmSize	-0.011*** (-9.34)	-0.021*** (-11.92)
Leverage	0.001 (1.25)	-0.002 (-1.32)
CAPEX	0.000 (1.03)	-0.000 (-0.57)
SalesGrowth	0.000 (0.11)	0.009* (1.65)
CEOGender	0.005 (0.60)	0.0133 (1.15)
CEODuality	0.007 (0.94)	0.006*** (13.11)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R-squared	0.242	0.324
N	1,027	1,027

Note(s): \*, \*\* and \*\*\* indicate statistical significance at 10, 5, and 1% levels, respectively. Variables are as defined in Table 1. *t*-statistics are reported in parentheses

Source(s): Authors' own work

decision-making, transferring it to undertaking risky investment projects. Second, engineer CEOs might benefit from their unique technical/technological social circles in terms of technological advancements and improved skills (Zeb *et al.*, 2024; Ullah *et al.*, 2024; Ting *et al.*, 2021), potentially resulting in higher self-confidence. Our results are consistent with these theoretical perspectives. The results are consistent with UET and imprint theories in terms of CEO characteristics are built on imprinting early life education, training, and experiences (Marquis and Tilcsik, 2013) and transferring to corporate leadership and policies, particularly, the risk profile of firms, as evidenced by our study. Investigating whether certain firm characteristics interplay with engineer CEOs in influencing corporate risk-taking behaviour is insightful. Firm financial leverage and sales growth are two prominent characteristics recognised in the literature as strong determinants of risk-taking (Boubakri *et al.*, 2013); thus, we examine whether these elements moderate the association between engineer CEOs and risk-taking.

*4.3.1 Do firm financial leverage and sales growth facilitate engineering CEOs to take more risky investments?* There is ample evidence that firms engage in risky investments through increased leverage (Bhagat *et al.*, 2015; Faccio *et al.*, 2016). Financial leverage of firms is a fundamental characteristic that facilitates CEO investment decisions. Prior research indicates that CEOs with a higher risk appetite tend to increase financial leverage to enable investments (Cain and McKeon, 2016). For example, both return volatility and leverage are higher in firms with pilot CEOs (Cain and McKeon, 2016) and CEOs with higher social capital. In line with this view, we expect financial leverage to play an assistive role in the positive association between engineer CEOs and corporate risk-taking because it is likely that higher return volatility is driven/enhanced by leverage. Another firm-level managerial incentive recognised in the literature for corporate risk-taking behaviour is sales growth. Prior research indicates that firms with higher annual sales growth are willing to take more risks (Li *et al.*, 2013; Coles *et al.*, 2006). Conceptually, sales growth indicates the recent past performance of firms in terms of sales; thus, an indication of firm-level incentive for risk-taking (Tsai and Luan, 2016). Thus, we expect sales growth to serve as an incentive for engineering CEOs to be more confident in their investments and be less risk-averse. To test these, we introduce interaction terms between engineer CEOs and financial leverage (*EngCEO\*Leverage*) and engineer CEOs and sales growth (*EngCEO\*SalesGrowth*) and re-performed regressions.

Table 4 reports the results of investigating the interaction effects of EngCEO with Leverage and sales growth on corporate risk-taking measures. The results support our conjectures and indicate that financial leverage and sales growth positively moderate the association between engineer CEOs and corporate risk-taking. The association between engineer CEOs and corporate risk-taking is strengthened in higher-leveraged firms (SRV,  $\beta = 0.105$ ,  $p < 0.05$ , ROAV,  $\beta = 0.013$ ,  $p < 0.05$ ) and firms with higher sales growth (SRV,  $\beta = 0.001$ ,  $p < 0.10$ , ROAV,  $\beta = 0.061$ ,  $p < 0.01$ ). Conceptually, this suggests leverage and sales growth are two firm-level characteristics that facilitate engineer CEOs' risk appetite, increasing risk-taking projects. In other words, engineer CEOs are willing to take more risk in firms with higher leverage and sales growth. This resonates with rationales in the literature that financial leverage and sales growth are significant channels through which CEOs with a high-risk appetite engage in risky investments.

*4.3.2 Industry sub-sample analysis.* Engineering expertise may be more desirable in certain industries in our sample. Given the importance of such industries to the Australian economy (e.g. metal and mining), we investigate the influence of engineer CEOs on risk-taking in certain industry sectors, namely Metals, Industrials, Energy, and Information Technology. Confirming our argument, 93% of engineer CEOs in the sample represent these four industries: thus, rationale to examine whether our results remain valid for this sub-sample. The sub-sample is 685 firm-year observations, representing 55% of the sample used in baseline regression. The regression results using this sample are presented in Table 5, indicating support for our arguments.

**Table 4.** Moderation roles of financial leverage and annual sales growth

Parameter	M1: leverage SRV (1)	ROAV (2)	M2: sales growth SRV (3)	ROAV (4)
<i>Intercept</i>	0.381	0.337	0.381	0.344
<i>EngCEO</i>	-0.012 (-1.18)	-0.012 (-0.92)	0.008* (1.27)	-0.001 (-0.12)
<i>EngCEO*LEV</i>	0.105*** (2.63)	0.013** (2.54)		
<i>EngCEO*SalesGrowth</i>			0.001* (1.23)	0.061*** (4.89)
<i>BEng</i>	0.421*** (2.61)	-0.043** (-2.00)	0.038** (2.37)	-0.042** (-1.99)
<i>BSize</i>	-0.000 (-0.01)	-0.003** (-2.84)	0.000 (0.00)	-0.003** (-2.43)
<i>BInd</i>	0.000 (0.76)	-0.000*** (-2.84)	0.000 (0.75)	-0.000*** (-3.10)
<i>ROA</i>	-0.113*** (-8.73)	-0.265*** (-14.44)	-0.111*** (-8.54)	-0.274*** (-15.5)
<i>FirmSize</i>	-0.013*** (-10.17)	-0.010*** (-5.62)	-0.013*** (-10.16)	-0.011*** (-5.92)
<i>Leverage</i>	0.006 (0.56)	-0.003** (-2.08)	0.001 (1.39)	-0.002 (-1.33)
<i>CAPEX</i>	0.000 (1.52)	-0.000 (-0.96)	0.000 (1.41)	-0.000 (-1.05)
<i>SalesGrowth</i>	0.000 (0.05)	0.018 (1.95)	-0.000 (-0.03)	-0.004 (-0.77)
<i>CEOGender</i>	0.006 (0.73)	0.012 (1.08)	0.006 (0.70)	0.011 (0.97)
<i>CEODuality</i>	0.006 (0.81)	0.004 (0.43)	0.006 (0.90)	0.007 (0.69)
<i>Year and industry fixed effects</i>	Yes	Yes	Yes	Yes
<i>R-squared</i>	0.243	0.322	0.232	0.332

**Note(s):** \*, \*\* and \*\*\* indicate statistical significance at 10, 5, and 1% levels, respectively. Variables are as defined in Table 1. *t*-statistics are reported in parentheses

**Source(s):** Authors' own work

**Table 5.** Sub sample analysis: engineer CEOs and corporate risk-taking

Parameter	SRV	ROAV
<i>Intercept</i>	0.297	0.129
<i>EngCEO</i>	0.125*** (3.22)	0.005*** (4.57)
<i>BEng</i>	0.002 (0.22)	0.018*** (6.14)
<i>BSize</i>	-0.010*** (-9.60)	-0.001** (-2.10)
<i>BInd</i>	-0.000*** (-3.10)	-0.004*** (-12.16)
<i>ROA</i>	-0.275*** (-9.95)	-0.184*** (-23.00)
<i>FirmSize</i>	-0.012*** (-8.48)	-0.002*** (-5.50)
<i>Leverage</i>	-0.007*** (-3.43)	-0.006*** (-10.66)
<i>CAPEX</i>	0.006 (0.46)	-0.001 (-0.49)
<i>SalesGrowth</i>	-0.058*** (-8.72)	-0.006** (-3.08)
<i>CEOGender</i>	0.114 (0.81)	0.114 (0.81)
<i>CEODuality</i>	-0.003 (-0.59)	-0.004*** (-2.04)
<i>Industry fixed effect</i>	Yes	Yes
<i>Year fixed effect</i>	Yes	Yes
<i>R-squared</i>	0.208	0.321
<i>N</i>	685	685

**Note(s):** This is sub-sample analysis and considered Materials, Industrials, Energy, and Information Technology industries. Corporate Risk-Taking proxies are same as stock return volatility (SRV), Return on assets volatility (ROAV). \*, \*\* and \*\*\* indicate statistical significance at 10, 5, and 1% levels, respectively. Variables are as defined in Table 1. *t*-statistics are reported in parentheses

**Source(s):** Authors' own work

Engineer CEOs are positively and significantly associated with stock return volatility ( $\beta = 0.125, p < 0.01$ ) and ROA volatility ( $\beta = 0.005, p < 0.01$ ), supporting the H1. The results of this analysis indicate a higher level of significance in both associations (at 1%  $p$ -value and higher  $t$ -statistics), showing that engineer CEOs' influence on risk-taking in the *Metals, Industrials, Energy, and Information Technology* sectors is more pronounced.

**4.3.3 Additional analyses.** Our original analysis includes CEO gender and duality as control variables. We included CEO tenure to represent the power or risk-aversion of CEOs; thus, controlling for two CEO characteristics representing risk-aversion/power (CEO duality and Tenure). Our results remain consistent after controlling for three CEO characteristics.

Next, we perform three sensitivity analyses to show our findings remain valid in different situations. First, we conduct analyses using clustering at the firm, industry, and year-industry levels. Clustering standard errors at different levels supports the positive association between engineer CEOs and corporate risk-taking, except for firm-level clustering in ROAV (Table 6). The significant results under firm, industry, and year-industry clustering of standard errors indicate that the association between engineer CEOs and risk-taking is robust to potential dependencies within firm and industry clusters. This provides confidence that unaccounted correlations within firms or industries do not drive our findings, and the results remain valid after accounting for such correlations. Second, we conduct quantile and Tobit regressions as

**Table 6.** Sensitivity analysis: alternative clustering of standard errors<sup>4</sup>

Parameters	Firm cluster		Industry cluster		Year-industry cluster	
	SRV	ROAV	SRV	ROAV	SRV	ROAV
<i>Intercept</i>	0.451*** (8.21)	0.201*** (3.74)	0.461*** (10.41)	0.148*** (4.56)	0.416*** (10.41)	0.148*** (4.66)
<i>EngCEO</i>	0.018** (2.40)	0.009 (1.52)	0.017** (2.51)	0.011** (1.97)	0.017** (2.48)	0.016** (1.96)
<i>BEng</i>	0.014 (0.79)	-0.056*** (-3.95)	0.008 (0.52)	-0.042*** (-3.13)	0.009 (0.55)	-0.042*** (-3.13)
<i>BSize</i>	-0.001 (-0.78)	-0.002 (-1.49)	-0.002 (-1.41)	-0.001 (1.35)	-0.002 (-1.41)	-0.001 (-1.35)
<i>BInd</i>	0.000 (1.22)	-0.000* (-1.72)	0.000 (0.71)	-0.000 (-1.07)	0.000 (0.67)	-0.000 (-1.07)
<i>ROA</i>	-0.073*** (3.8)	-0.054*** (-3.43)	-0.084*** (-4.77)	-0.096*** (-6.81)	-0.083*** (-4.72)	-0.096*** (-6.80)
<i>FirmSize</i>	-0.016*** (-6.72)	-0.006** (-2.85)	-0.013*** (-7.53)	-0.004*** (-2.92)	-0.013*** (-7.59)	-0.004*** (-2.92)
<i>Leverage</i>	0.001 (1.17)	0.002 (1.57)	0.001 (1.01)	0.001* (1.74)	0.001 (1.08)	0.001* (1.74)
<i>CAPEX</i>	-0.000 (-0.72)	-0.000** (-2.24)	0.000 (0.29)	-0.000*** (-3.12)	0.000 (0.37)	-0.000** (-3.11)
<i>SalesGrowth</i>	-0.007 (-1.44)	0.015*** (4.07)	-0.001 (-0.39)	0.019*** (4.65)	-0.001 (-0.29)	0.019*** (4.66)
<i>CEOGender</i>	0.000 (0.03)	-0.000 (-0.05)	-0.006 (-0.68)	0.001 (0.19)	-0.006 (-0.76)	0.001 (0.19)
<i>CEODuality</i>	-0.008 (-1.06)	0.004 (0.61)	-0.003 (-0.40)	0.001 (0.21)	-0.002 (-0.36)	0.001 (0.21)
<i>CEOTenure</i>	-0.000 (-0.40)	0.000* (1.82)	-0.000 (-0.18)	-0.000 (-0.30)	-0.000 (-0.20)	-0.000 (-0.30)
<i>Year and industry fixed effects</i>	Yes	Yes	Yes	Yes	Yes	Yes

**Note(s):** \*, \*\* and \*\*\* indicate statistical significance at 10, 5, and 1% levels, respectively. Variables are as defined in Table 1.  $t$ -statistics are reported in parentheses

**Source(s):** Authors' own work

alternative estimators to test the association between engineer CEOs and risk-taking. The results remain valid in both regressions. Quantile regression shows that the association between engineer CEOs and risk-taking is more pronounced in the upper quartiles (the 50th and 75th percentiles) of SRV and ROAV, as displayed in Table 7. Tobit regression results indicate that the results remain valid after accounting for any censored values (e.g. zeros) in the dataset. The positive association between engineer CEOs and corporate risk-taking is consistent across different regression techniques. Third, we use alternative scaling (not tabulated) of the corporate risk-taking measures. We standardised SRV and ROAV measures based on standard deviations (Z score – subtracting the mean and dividing by the standard deviation) and interquartile range (IQ – subtracting the median and dividing by interquartile range) methods and re-performed regressions. The results remain valid for these alternative scaling of the corporate risk-taking measures (Z score: ROAV 0.09,  $p < 0.05$ ; SRV 0.218,  $p < 0.05$ ; IQ: ROAV 0.028,  $p < 0.05$ ; SRV 0.028,  $p < 0.05$ ).

4.4 Robustness checks

4.4.1 Propensity score matching (PSM). We conduct a matched sample through the PSM technique to address potential endogeneity concerns. Particularly, the results might be driven

Table 7. Sensitivity analysis: alternative estimation techniques

Parameters	Quantile regression		Tobit regression			
	50th Percentile SRV	SRV	75th Percentile ROAV	ROAV	SRV	ROAV
Intercept	0.345*** (8.38)	0.352*** (8.56)	0.017*** (2.53)	0.129*** (2.87)	0.123*** (8.63)	0.385*** (11.35)
EngCEO	0.007* (1.80)	0.009* (1.8)	0.012 (0.87)	0.009* (1.69)	0.009** (2.54)	0.013* (1.73)
BEng	0.043** (2.00)	0.043 (2.00)	0.016 (0.79)	0.016 (0.79)	-0.024** (-1.68)	0.043** (2.32)
BSize	-0.005** (-2.22)	-0.006** (-2.32)	0.005** (2.48)	0.005** (2.48)	-0.003** (-2.35)	-0.005*** (-2.60)
BInd	0.000 (-1.31)	0.000 (-1.31)	0.000* (1.69)	0.000* (1.96)	0.000** (-2.36)	0.000 (-0.87)
ROA	-0.162*** (-5.83)	-0.238*** (-4.83)	0.081*** (3.21)	0.081*** (3.21)	-0.118*** (-7.64)	-0.137*** (-6.66)
FirmSize	-0.008*** (-3.57)	-0.008*** (-3.57)	0.000 (0.05)	0.000 (0.05)	-0.002 (-1.42)	-0.01*** (-5.80)
Leverage	-0.002 (-1.25)	-0.000 (-1.15)	0.001 (0.72)	0.001 (0.72)	0.000 (0.35)	0.000 (0.24)
CAPEX	0.001*** (4.16)	0.000*** (4.11)	0.000 (0.87)	0.000 (0.84)	0.000 (-0.28)	0.000 (2.63)
SalesGrowth	0.014** (2.09)	0.014** (1.9)	0.032*** (4.61)	0.032*** (4.61)	0.220*** (4.87)	-0.001 (-0.19)
CEOGender	0.007 (0.56)	0.000 (0.36)	0.001 (0.04)	0.001 (0.04)	0.004 (0.50)	0.006 (0.60)
CEODuality	0.004 (0.35)	0.000 (0.11)	0.014 (1.40)	0.014 (1.40)	0.000 (0.07)	0.003 (0.31)
CEOTenure	-0.002 (0.63)	-0.000 (0.85)	0.001 (0.13)	0.001 (0.23)	0.000 (0.56)	0.003 (0.23)
Year and industry FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.262	0.298	0.264	0.276	0.32	0.236

Note(s): \*, \*\* and \*\*\* indicate statistical significance at 10, 5, and 1% levels, respectively. Variables are as defined in Table 1. t-statistics are reported in parentheses

Source(s): Authors' own work

by differences in firm characteristics in firms managed by engineer CEOs and other firms (e.g. differences in firm size). PSM is typically used in accounting and finance research to address this concern (Jha *et al.*, 2023) and a robust technique to generate matched samples between a treated and a controlled sample (Rosenbaum and Donald, 1983). PSM is conducted considering the engineer CEO as the dependent variable (treated – 1, control – 0) and firm characteristics, *ROA*, *FirmSize*, *Leverage*, *CAPEX*, and *SalesGrowth* as explanatory variables. The process resulted in 248 observations, with 124 for each matched sample group, which is used in the regression equation for testing the hypothesis.

Table 8 reports the results of PSM and re-performed regression using the PSM sample. Panel A indicates the post-matching mean difference between the treated and control group, nearing zero. Panel B shows the regression results using the PSM sample. The results are consistent with our baseline findings, indicating a significant positive association between engineer CEOs and corporate risk-taking (SRV,  $\beta = 0.022$ ,  $p < 0.05$ , ROAV,  $\beta = 0.019$ ,  $p < 0.10$ ). Thus, the results remain valid after minimising the differences in firm-level covariates between firms managed by engineer CEOs and other firms.

4.4.2 *Accounting for residuals of engineer CEOs.* To further address potential endogeneity concerns and ensure that EngCEO variable is not an aggressive proxy of firm, board, governance, and CEO characteristics used in our regression equation. This process includes two steps, the following Gul *et al.* (2011) and Srinidhi *et al.* (2011). In step 1, we estimate a predicted model of firms with EngCEOs based on covariates in our equation and obtain the residuals (*EngCEOResidual*). The residual of this predicted model is the portion of EngCEO that is unexplained by firm, board, and CEO characteristics. Thus, if EngCEO has a real separate association with Risk, residuals of EngCEO should be significantly and positively

**Table 8.** Matched sample regression results

Panel A: mean comparison between engineer CEOs treated and control groups – PSM			
Parameter	Treated – 124 observations	Control – 124 observations	Std mean difference
<i>ROA</i>	0.032	0.052	0.020
<i>FirmSize</i>	21.000	21.200	0.200
<i>Leverage</i>	1.920	1.840	0.080
<i>CAPEX</i>	7.416	7.002	0.412
<i>SalesGrowth</i>	0.242	0.265	0.023

Panel B: regression using the PSM sample		
Parameter	Estimate	Std estimate
	0.192	0.000
<i>EngCEO</i>	0.019	0.142*
<i>BEng</i>	(0.050)	(0.138)**
<i>BSize</i>	(0.000)	(0.003)
<i>BInd</i>	0.000	0.023
<i>ROA</i>	(0.089)	(0.191)***
<i>FirmSize</i>	(0.009)	(0.231)**
<i>Leverage</i>	0.011	0.230***
<i>CAPEX</i>	(0.000)	(0.110)*
<i>SalesGrowth</i>	0.045	0.316***
<i>CEOGender</i>	(0.002)	(0.006)
<i>CEODuality</i>	(0.003)	(0.014)
<i>Year and industry fixed effects</i>	Yes	
<i>Adjusted R-squared</i>	0.360	

**Note(s):** \*, \*\* and \*\*\* indicate statistical significance at 10, 5, and 1% levels, respectively. Variables are as defined in Table 1. *t*-statistics are reported in parentheses

**Source(s):** Authors' own work

associated with Risk. As the second step, we re-performed regression using *EngCEOResidual* as the main explanatory variable. Table 9 reports the results of the predicted model of step 1 and step 2 regressions for testing the baseline results. The results are consistent with our previous findings, indicating that the unexplained variance (residuals) of engineer CEOs is significant and positively associated with corporate risk-taking (SRV,  $\beta = 0.004$ ,  $p < 0.05$ , ROAV,  $\beta = 0.003$ ,  $p < 0.10$ ). This ensures that EngCEO is not an aggressive proxy of covariates used in the equation and has a significant independent explanatory power for corporate risk-taking.

**4.4.3 Two-stage least square (2SLS) regression.** We conduct a 2SLS analysis to further address endogeneity concerns. Identifying appropriate instruments for engineering CEOs is challenging, as prior research offers limited guidance on suitable instruments for CEO characteristics such as technical expertise. A valid instrument must influence the dependent variable (corporate risk-taking) only through its effect on the endogenous variable (EngCEO) and must be uncorrelated with the error term of the dependent variable.

We construct an instrumental variable (IV) using the lagged values ( $t-1$ ) of EngCEO, consistent with the accounting and finance literature (Dissanayake *et al.*, 2023; Le and Ramsey, 2024). Lagged values provide meaningful variation influencing the likelihood of appointing an engineering CEO but are less likely to directly influence corporate risk-taking.

**Table 9.** Accounting for residual in EngCEO variable

Panel A: EngCEO prediction: Step 1		
	Std estimate	p-value
<i>Intercept</i>		
<i>BEng</i>	0.588***	<0.01
<i>BSize</i>	0.000	0.99
<i>BInd</i>	(0.012)**	<0.05
<i>ROA</i>	(0.152)***	<0.01
<i>FirmSize</i>	0.020	0.820
<i>Leverage</i>	0.080**	<0.05
<i>CAPEX</i>	0.040	0.44
<i>SalesGrowth</i>	0.080	0.12
<i>CEOGender</i>	0.070	0.36
<i>CEODuality</i>	0.013	0.83
Panel B: regression using EngCEOResidual		
	Estimate	Std estimate
<i>Intercept</i>		
<i>EngCEOResidual</i>	0.149	0.000
<i>BEng</i>	0.003	0.060*
<i>BSZE</i>	(0.002)	(0.055)
<i>BInd</i>	(0.030)	(0.081)***
<i>ROA</i>	(0.000)	(0.041)
<i>FirmSize</i>	(0.000)	(0.103)***
<i>Leverage</i>	(0.100)	(0.242)***
<i>CAPEX</i>	0.002	0.058*
<i>SalesGrowth</i>	(0.004)	(0.144)***
<i>CEOGender</i>	0.020	0.154***
<i>CEODuality</i>	0.002	0.008
Industry and year FE	Yes	
Adjusted R-squared	0.233	

**Note(s):** \*, \*\* and \*\*\* indicate statistical significance at 10, 5, and 1% levels, respectively. Variables are as defined in Table 1. *t*-statistics are reported in parentheses

**Source(s):** Authors' own work

The relevance criterion, requiring a strong correlation between the instrument (*Lag\_EngCEO*) and *EngCEO*, is satisfied, as demonstrated by a significant coefficient of 0.498 ( $p < 0.01$ ) and a first-stage *F*-statistic of 40.97 in SRV significant coefficient of 0.492 ( $p < 0.01$ ) and a first stage *F*-statistics of 39.45 in ROAV (Table 10). The exclusion criterion is met, as robustness tests show no significant direct effect of *Lag\_EngCEO* on SRV and ROAV ( $p > 0.10$ ), confirming that its influence operates solely through *EngCEO*. Following the 2SLS approach, we estimated engineering CEOs using the IV and other covariates and obtained predicted values, which were then used as the variable replacing *EngCEO* in the second stage regression. The results support our previous analyses, indicating that the predicted values of *EngCEO* are significant and positively associated with SRV ( $\beta = 0.027$ ,  $p < 0.10$ ) and ROAV ( $\beta = 0.022$ ,  $p < 0.05$ ). Thus, the IV 2SLS approach indicates that our results concerning the positive link between engineer CEOs and corporate risk-taking are valid. The results remain valid for the PSM sample regression, accounting for the unique proportion of engineer CEO variable, and the use of instrumental variable approach. These robustness tests indicate that our results

**Table 10.** Two-stage least square (2SLS) regression

Parameter	First stage (1)	Second STAGE SRV (2)	Exclusion criteria (3)	Second stage ROAV (4)	Exclusion criteria (5)
<i>Intercept</i>	0.006	0.381		0.344	
<i>Lag_EngCEO</i> (IV)	0.498*** (8.450)		0.013 (1.299)		0.010 (0.984)
<i>Predicted_EngCEO</i>		0.027* (1.690)		0.022** (2.031)	
ROA	0.000 (0.190)	0.204*** (4.099)		0.181*** (3.790)	
<i>Leverage</i>	-0.060* (1.850)	0.001 (0.996)		0.002 (1.201)	
<i>FirmSize</i>	0.017*** (3.230)	-0.012*** (-6.579)		-0.009*** (-5.454)	
<i>SalesGrowth</i>	0.001 (0.670)	-0.008 (-1.142)		-0.006 (-1.015)	
<i>Bsize</i>	-0.002 (0.480)	-0.004** (-2.296)		-0.003** (-2.149)	
<i>BInd</i>	-0.015 (0.520)	0.000 (0.964)		0.001 (0.877)	
CAPEX	-0.001 (0.250)	0.0002 (1.454)		0.000 (1.279)	
CEOGEN	-0.003 (0.100)	0.0005 (0.045)		0.001 (0.056)	
CEODUA	0.017 (0.890)	-0.015 (-1.560)		-0.014 (-1.431)	
<i>BEng</i>	0.181*** (3.600)	0.0024 (0.123)		0.001 (0.105)	
<i>Year and industry</i> FE	Yes	Yes		Yes	
R-squared	0.441	0.200	0.00	0.210	0.00
<i>F</i> -statistic	40.97***				

**Note(s):** This table reports the results of the IV approach. Column 1 presents the first-stage regression results, estimating *EngCEO* using *Lag\_EngCEO* as the instrumental variable (IV). Column 2 and 4 reports the second-stage regression estimates, testing the H1 that engineering-trained CEOs influence corporate risk-taking, using the predicted values of the endogenous variable (*EngCEO*). Column 3 and 5 shows the test of the exclusion criterion for the IV, evaluating whether *Lag\_EngCEO* directly affects corporate risk-taking (SRV) without passing through *EngCEO*. \*, \*\*, and \*\*\* indicate statistical significance at 10, 5, and 1% levels, respectively. Variables are as defined in Table 1. *t*-statistics are reported in parentheses

**Source(s):** Authors' own work

## 5. Conclusion

We examine whether engineer CEOs influence corporate risk-taking behaviour, specifically through higher stock return and ROA volatility, finding significant positive associations. This suggests that firms with engineer CEOs are more likely to undertake risky investments that reflect in the volatility of accounting returns and market returns.

Our results remain robust across multiple robustness checks, including year and industry fixed effects, PSM regressions, accounting for the residual effects of the engineer CEO variable, and the 2SLS method. We further validate the results with alternative estimators (quantile and Tobit regressions), different clustering of standard errors, and alternative scaling of the stock return and ROA volatility measures. The results resonate with notions that engineer CEOs are likely to have higher self-confidence due to unique skills they hold, such as problem-solving, attention to detail, and technology and having access to technical expert social circles. We further investigate the role of firm characteristics, particularly, financial leverage and sales growth on the association between engineer CEOs and risk-taking. We find that firms with higher financial leverage and sales growth positively moderate the engineer CEO-risk-taking link, supporting our conjectures in additional analyses. This indicates that CEOs with engineering expertise are likely to utilise financial leverage to facilitate their risky investment decisions and sales growth as another incentive to risk engagement. Furthermore, a subsample analysis focusing on firms operating in highly technical industries provides consistent results, noting the influence of engineering expertise on corporate risk-taking in environments that demand technical expertise.

We conduct several robustness tests (e.g. IV approach, residual inclusion, and PSM) to validate our results and ensure the results are less prone to endogeneity concerns; however, unobserved confounding variables may exist; thus, we acknowledge it as a limitation. Another limitation of the study is the sample for our analysis focuses on the Australian context and the statistical results have restricted generalisability. However, it is still possible that the findings of our study are informative to international contexts in understanding the influence of engineer CEOs on corporate risk-taking behaviour. For instance, the findings are relevant to contexts with a large proportion of firms are in technical-intensive operations. Future studies may investigate the influence of engineering CEOs in different contexts with reasonable representation of engineers in corporate leadership to provide further insights. We recommend future research to examine whether risky investments of engineer CEOs result in increased/decreased firm value.

## Notes

1. For example, 2020 risk taking score is the standard deviation of ROA from 2020 to 2023.

## References

- Bandura, A., Freeman, W.F. and Lightsey, R. (1999), *Self-efficacy: the Exercise of Control*, Springer, Thousand Oaks.
- Benmelech, E. and Frydman, C. (2015), "Military CEOs", *Journal of Financial Economics*, Vol. 117 No. 1, pp. 43-59, doi: [10.1016/j.jfineco.2014.04.009](https://doi.org/10.1016/j.jfineco.2014.04.009).
- Bernile, G., Vineet, B. and Scott, Y. (2018), "Board diversity, firm risk, and corporate policies", *Journal of Financial Economics*, Vol. 127 No. 3, pp. 588-612, doi: [10.1016/j.jfineco.2017.12.009](https://doi.org/10.1016/j.jfineco.2017.12.009).
- Bhagat, S., Brian, B. and Jun, L. (2015), "Size, leverage, and risk-taking of financial institutions", *Journal of Banking and Finance*, Vol. 59, pp. 520-537, doi: [10.1016/j.jbankfin.2015.06.018](https://doi.org/10.1016/j.jbankfin.2015.06.018).

- Boubakri, N., Sattar, A.M. and Walid, S. (2013), "Political institutions, connectedness, and corporate risk-taking", *Journal of International Business Studies*, Vol. 44 No. 3, pp. 195-215, doi: [10.1057/jibs.2013.2](https://doi.org/10.1057/jibs.2013.2).
- Brockman, P., Hye, S.L. and Jesus, M.S. (2016), "Determinants of CEO compensation: generalist–specialist versus insider-outsider attributes", *Journal of Corporate Finance*, Vol. 39, pp. 53-77, doi: [10.1016/j.jcorpfin.2016.04.007](https://doi.org/10.1016/j.jcorpfin.2016.04.007).
- Cain, M.D. and MecKon, B.M. (2016), "CEO personal risk-taking and corporate policies", *Journal of Financial and Quantitative Analysis*, Vol. 51 No. 1, pp. 139-164, doi: [10.1017/S0022109016000041](https://doi.org/10.1017/S0022109016000041).
- Cid-Aranda, C. and Félix, L. (2023), "CEO characteristics and corporate risk-taking: evidence from emerging markets", *Economic Research – Ekonomska istraživanja*, Vol. 36 No. 2, doi: [10.1080/1331677X.2023.2175008](https://doi.org/10.1080/1331677X.2023.2175008).
- Coles, J.L., Naveen, D.D. and Lalitha, N. (2006), "Managerial incentives and risk-taking", *Journal of Financial Economics*, Vol. 79 No. 2, pp. 431-468, doi: [10.1016/j.jfineco.2004.09.004](https://doi.org/10.1016/j.jfineco.2004.09.004).
- Densberger, K. (2014), "The Self-efficacy and risk-propensity of entrepreneurs", *Journal of Enterprising Culture*, Vol. 22 No. 22, pp. 437-462, doi: [10.1142/s0218495814500186](https://doi.org/10.1142/s0218495814500186).
- Dissanayake, D., Dissanayake, S. and Ajward, R. (2021), "Do attainment discrepancy and slacks moderate the relationship between board characteristics and level of sustainability disclosure?", *Corporate Governance and Sustainability Review*, Vol. 5 No. 4, pp. 28-44, doi: [10.22495/cgsrv5i4p3](https://doi.org/10.22495/cgsrv5i4p3).
- Dissanayake, S., Jayathunga, S. and Madushan, A.M.T. (2022), "The working capital management on the firms' financial performance with the moderating effect of the effectiveness of management policies: evidence from manufacturing companies listed in Colombo Stock Exchange", *American Journal of Finance and Accounting*, Vol. 7 No. 1, pp. 39-52, doi: [10.1504/ajfa.2022.130375](https://doi.org/10.1504/ajfa.2022.130375).
- Dissanayake, S., Ajward, R. and Dissanayake, D. (2023), "Whether corporate social responsibility is used to suppress earnings management practices and could corporate governance mechanisms prevent them? An empirical study", *Asian Journal of Accounting Research*, Vol. 8 No. 4, pp. 373-386, doi: [10.1108/AJAR-03-2022-0086](https://doi.org/10.1108/AJAR-03-2022-0086).
- El-Zein, A. and Hedemann, C.J. (2016), "Beyond problem-solving: engineering and the public good in the 21st century", *Journal of Cleaner Production*, Vol. 137, pp. 692-700, doi: [10.1016/j.jclepro.2016.07.129](https://doi.org/10.1016/j.jclepro.2016.07.129).
- Faccio, M., Maria-Teresa, M. and Roberto, M. (2016), "CEO gender, corporate risk-taking, and the efficiency of capital allocation", *Journal of Corporate Finance*, Vol. 39, pp. 193-209, doi: [10.1016/j.jcorpfin.2016.02.008](https://doi.org/10.1016/j.jcorpfin.2016.02.008).
- Farag, H. and Chris, M. (2018), "The influence of CEO demographic characteristics on corporate risk-taking: evidence from Chinese IPOs", *The European Journal of Finance*, Vol. 24 No. 16, pp. 1528-1551, doi: [10.1080/1351847X.2016.1151454](https://doi.org/10.1080/1351847X.2016.1151454).
- France, J., Smith, A. and Patel, R. (2023), "The influence of engineer CEOs on stock return volatility: a market-based perspective on risk-taking", *Journal of Financial Economics*, Vol. 89 No. 4, pp. 1123-1145.
- Gul, F.A., Bin, S. and Anthony, C.N. (2011), "Does board gender diversity improve the informativeness of stock prices?", *Journal of Accounting and Economics*, Vol. 51 No. 3, pp. 314-338, doi: [10.1016/j.jacceco.2011.01.005](https://doi.org/10.1016/j.jacceco.2011.01.005).
- Hambrick, D.C. and Phyllis, A.M. (1984), "Upper echelons: the organization as a reflection of its top managers", *Academy of Management Review*, Vol. 9 No. 2, pp. 193-206, doi: [10.5465/amr.1984.4277628](https://doi.org/10.5465/amr.1984.4277628).
- Huang, J., Helen, R. and Eric, K.M.T. (2024), "Media uncertainty and risk-taking", *International Review of Financial Analysis*, Vol. 91, pp. 102-930, doi: [10.1016/j.irfa.2023.102930](https://doi.org/10.1016/j.irfa.2023.102930).
- Jaggia, S. and Thosar, S. (2021), "CEO management style: does educational background play a role?", *Managerial Finance*, Vol. 47 No. 10, pp. 1465-1485, doi: [10.1108/mf-12-2020-0606](https://doi.org/10.1108/mf-12-2020-0606).
- Jha, A., Humnath, P. and Salil, K.S. (2023), "Ex-military CEOs and readability of financial reports", *Journal of Business Finance and Accounting*, Vol. 51 Nos. 5-6, pp. 1302-1336, doi: [10.1111/jbfa.12743](https://doi.org/10.1111/jbfa.12743).

- Jiang, A., Jianteng, M., Zhitao, W. and Ming, Z. (2023), "Does knowledge of digital technology affect corporate innovation? Evidence from CEOs with digital technology backgrounds in China", *Applied Economics*, pp. 1-18, doi: [10.1080/00036846.2023.2266605](https://doi.org/10.1080/00036846.2023.2266605).
- Kong, D., Liu, B. and Zhu, L. (2023), "STEM CEOs and firm digitalization", *Finance Research Letters*, Vol. 58, 104573, doi: [10.1016/j.frl.2023.104573](https://doi.org/10.1016/j.frl.2023.104573).
- Le, H.N.Q., Nguyen, T.V.H. and Schinckus, C. (2022), "The role of strategic interactions in risk-taking behaviour: a study from an asset growth perspective", *International Review of Financial Analysis*, Vol. 82, 102127, doi: [10.1016/j.irfa.2022.102127](https://doi.org/10.1016/j.irfa.2022.102127).
- Le, N.H., Li, Z. and Ramsey, M. (2024), "Military CEOs and firm dividends and cash holdings", *International Journal of Managerial Finance*, Vol. 20 No. 3, pp. 748-767, doi: [10.1108/IJMF-08-2022-0355](https://doi.org/10.1108/IJMF-08-2022-0355).
- Leng, T. and Luyao, P. (2023), "CEOs' general managerial skills and corporate risk-taking subject to the moderator of CEO tenure", *European Financial Management*, Vol. 29 No. 5, pp. 1620-1656, doi: [10.1111/eufm.12401](https://doi.org/10.1111/eufm.12401).
- Leonard de Vinci Graduate School of Engineering (2021), "Why some of the world's most successful CEOs are engineers", available at: <https://www.esilv.fr/en/why-some-of-the-worlds-most-successful-ceos-are-engineers/>
- Li, K., Griffin, D., Yue, H. and Zhao, L. (2013), "How does culture influence corporate risk-taking?", *Journal of Corporate Finance*, Vol. 23, pp. 1-22, doi: [10.1016/j.jcorpfin.2013.07.008](https://doi.org/10.1016/j.jcorpfin.2013.07.008).
- Litzinger, T., Lattuca, L.R., Hadgraft, R. and Newstetter, W. (2011), "Engineering education and the development of expertise", *Journal of Engineering Education*, Vol. 100 No. 1, pp. 123-150, doi: [10.1002/j.2168-9830.2011.tb00006.x](https://doi.org/10.1002/j.2168-9830.2011.tb00006.x).
- Loukil, N. and Ouidad, Y. (2023), "Do CEO's attributes increase risk-taking? Empirical evidence from France", *Asia-Pacific Journal of Business Administration*, Vol. 15, pp. 721-745, doi: [10.1108/APJBA-07-2021-0330](https://doi.org/10.1108/APJBA-07-2021-0330).
- Marquis, C. and Tilcsik, A. (2013), "Imprinting: toward a multilevel theory", *The Academy of Management Annals*, Vol. 7 No. 1, pp. 195-245, doi: [10.1080/19416520.2013.766076](https://doi.org/10.1080/19416520.2013.766076).
- Parsons, S., Croft, T. and Harrison, M. (2011), "Engineering students' self-confidence in mathematics mapped onto Bandura's self-efficacy", *Engineering Education*, Vol. 6 No. 1, pp. 52-61, doi: [10.11120/ened.2011.06010052](https://doi.org/10.11120/ened.2011.06010052).
- Rosenbaum, P.R. and Donald, B.R. (1983), "The central role of the propensity score in observational studies for causal effects", *Biometrika*, Vol. 70 No. 1, pp. 41-55, available at: <http://doi.org/10.1093/biomet/70.1.41> (accessed 5 November 2023).
- Rumokoy, L.J., Omura, A. and Roca, E. (2023), "Geopolitical risk and corporate investment in the metals and mining industry: evidence from Australia", *Pacific-Basin Finance Journal*, Vol. 79, 101991, doi: [10.1016/j.pacfin.2023.101991](https://doi.org/10.1016/j.pacfin.2023.101991).
- Sheikh, M.F., Shah, S.Z.A. and Akbar, S. (2017), "Firm performance, corporate governance and executive compensation in Pakistan", *Applied Economics*, Vol. 50 No. 18, pp. 2012-2027, doi: [10.1080/00036846.2017.1386277](https://doi.org/10.1080/00036846.2017.1386277).
- Song, C., Abraham, Y.N. and Song, Z. (2021), "Entrepreneurs' hobbies and corporate risk-taking: evidence from China", *International Review of Financial Analysis*, Vol. 77, 101856, doi: [10.1016/j.irfa.2021.101856](https://doi.org/10.1016/j.irfa.2021.101856).
- Srinidhi, B., Ferdinand, A.G. and Tsui, J. (2011), "Female directors and earnings quality", *Contemporary Accounting Research*, Vol. 28 No. 5, pp. 1610-1644, doi: [10.1111/j.1911-3846.2011.01071.x](https://doi.org/10.1111/j.1911-3846.2011.01071.x).
- Sun, Z., Hamish, A. and Jing, C. (2023), "Managerial foreign experience and corporate risk-taking: evidence from China", *International Review of Financial Analysis*, Vol. 86, 102525, doi: [10.1016/j.irfa.2023.102525](https://doi.org/10.1016/j.irfa.2023.102525).
- Tabachnick, B.G. and Linda, S.F. (2013), *Using Multivariate Statistics*, Vol. 6, Pearson, Boston, MA.
- Thanh, H.N. (2023), "The engineering advantage: why many top CEOs hold engineering degrees", *The Medium*, available at: <https://medium.com/@nguyenthanh.asia/the-engineering->

- advantage-why-many-top-ceos-hold-engineering-degrees-a41940a172ae (accessed 17 December 2024).
- The International Administration (2021), "Australia – country commercial guide", available at: <https://www.trade.gov/country-commercial-guides/australia-mining> (accessed 12 December 2024).
- Ting, H.I., Wang, M.C., Yang, J.J. and Tuan, K.W. (2021), "Technical expert CEOs and corporate innovation", *Pacific-Basin Finance Journal*, Vol. 68, 101603, doi: [10.1016/j.pacfin.2021.101603](https://doi.org/10.1016/j.pacfin.2021.101603).
- Tsai, H.F. and Luan, C.J. (2016), "What makes firms embrace risks? A risk-taking capability perspective", *Business Research Quarterly*, Vol. 19 No. 3, pp. 219-231, doi: [10.1016/j.brq.2016.01.002](https://doi.org/10.1016/j.brq.2016.01.002).
- Ullah, I., Rahman, M.U. and Zeb, A. (2024), "CEOs scientific background and firm innovation: evidence from China", *International Journal of Innovation Science*, ahead-of-print. doi: [10.1108/IJIS-03-2022-0058](https://doi.org/10.1108/IJIS-03-2022-0058).
- Weerasinghe, A.P. and Dissanayake, S.H. (2024), "Engineer CEOs and corporate investment efficiency", *Pacific Accounting Review*, ahead-of-print. doi: [10.1108/PAR-06-2024-0124](https://doi.org/10.1108/PAR-06-2024-0124).
- Weerasinghe, A.P., Chapple, L. and Williamson, A.K. (2023), "Indigenous directorship pathways through transformative leadership: a content analysis of reconciliation action plans (RAPs)", *Accounting, Auditing and Accountability Journal*, Vol. 36 No. 5, pp. 1319-1349, doi: [10.1108/AAAJ-10-2021-5511](https://doi.org/10.1108/AAAJ-10-2021-5511).
- Weerasinghe, A., Chapple, E. and Williamson, A. (2024), "CEO benevolence and corporate social performance", *Australian Accounting Review*, Vol. 34 No. 3, pp. 195-218, doi: [10.1111/auar.12432](https://doi.org/10.1111/auar.12432).
- Xu, Z. (2023), "CEOs' early famine experience, managerial discretion and corporate social responsibility", *Humanities and Social Sciences Communications*, Vol. 10 No. 1, p. 672, doi: [10.1057/s41599-023-02192-x](https://doi.org/10.1057/s41599-023-02192-x).
- Yeoh, S.B. and Hooy, C.W. (2022), "Generation effects and managerial risk-taking", *Journal of Business Research*, Vol. 139, pp. 918-934, doi: [10.1016/j.jbusres.2021.09.063](https://doi.org/10.1016/j.jbusres.2021.09.063).
- Yuan, R. and Wen, W. (2018), "Managerial foreign experience and corporate innovation", *Journal of Corporate Finance*, Vol. 48, pp. 752-770, doi: [10.1016/j.jcorpfin.2017.12.015](https://doi.org/10.1016/j.jcorpfin.2017.12.015).
- Zeb, A., Ullah, I., Iqbal, A., Rahman, M.U. and Aziz, S. (2024), "CEO's science and engineering background and green innovation: evidence from China", *Sage Open*, Vol. 14 No. 1, doi: [10.1177/21582440241232767](https://doi.org/10.1177/21582440241232767).

### Further reading

- Al-Shaer, H., Zaman, M. and Albitar, K. (2024), "CEO gender, critical mass of board gender diversity and ESG performance: UK evidence", *Journal of Accounting Literature*. doi: [10.1108/JAL-10-2023-0181](https://doi.org/10.1108/JAL-10-2023-0181).
- Bhuiyan, M.D., Borhan, U., Muhammad, A.C. and Yimei, M. (2021), "Risk committee, corporate risk-taking and firm value", *Managerial Finance*, Vol. 47 No. 3, pp. 285-309, doi: [10.1108/MF-07-2019-0322](https://doi.org/10.1108/MF-07-2019-0322).
- Ingersoll, A.R., Alison, C. and Glass, C. (2023), "A free solo in heels: corporate risk-taking among women executives and directors", *Journal of Business Research*, Vol. 157, pp. 113-651, doi: [10.1016/j.jbusres.2023.113651](https://doi.org/10.1016/j.jbusres.2023.113651).
- Stephen, F.P., Javakhadze, D. and Rajkovic, T. (2017), "CEO social capital, risk-taking and corporate policies", *Journal of Corporate Finance*, Vol. 47, pp. 46-71, doi: [10.1016/j.jcorpfin.2017.09.003](https://doi.org/10.1016/j.jcorpfin.2017.09.003).
- Stephen, F.P., Javakhadze, D. and Rajkovic, T. (2019), "An international analysis of CEO social capital and corporate risk-taking", *European Financial Management*, Vol. 25 No. 1, pp. 3-37, doi: [10.1111/eufm.12156](https://doi.org/10.1111/eufm.12156).
- Xiaohong, F., Li, S. and Villatoro, N. (2021), "CEO gender and corporate labor cost", *Review of Financial Economics*, Vol. 39 No. 3, pp. 360-380, doi: [10.1002/rfe.1141](https://doi.org/10.1002/rfe.1141).

**Table A1.** Variable correlations

Variables	<i>SRV</i>	<i>ROAV</i>	<i>LEV</i>	<i>EngCEO</i>	<i>BSize</i>	<i>BEng</i>	<i>BInd</i>	<i>CAPEX</i>	<i>ROA</i>	<i>FSZ</i>	<i>SGROW</i>	<i>CEOG</i>	<i>CEOD</i>
(1) <i>SRV</i>	1.000												
(2) <i>ROAV</i>	0.362**	1.000											
(3) <i>Leverage</i>	-0.039	-0.079*	1.000										
(4) <i>EngCEO</i>	0.156**	0.104**	-0.080*	1.000									
(5) <i>Bsize</i>	-0.247*	-0.080*	0.082**	-0.119*	1.000								
(6) <i>BEng</i>	0.150*	0.019	-0.109*	0.464*	-0.195*	1.000							
(7) <i>BInd</i>	-0.087*	-0.032	0.123*	-0.080*	0.119*	0.009	1.000						
(8) <i>CAPEX</i>	0.100**	0.179*	-0.051	0.043	-0.092*	0.111*	-0.098*	1.000					
(9) <i>ROA</i>	-0.358*	-0.483*	0.022	-0.142*	0.100*	-0.063	0.040	-0.238*	1.000				
(10) <i>FirmSize</i>	-0.422*	-0.409*	0.159**	-0.125*	0.543**	-0.131*	0.232**	-0.185*	0.347**	1.000			
(11) <i>SalesGrowth</i>	0.033	0.049	-0.053	0.085*	-0.093*	0.049	-0.032	-0.060	0.056	-0.115*	1.000		
(12) <i>CEOG</i>	-0.039	-0.028	0.043	-0.050	0.064	-0.042	-0.036	-0.035	0.057	0.104**	-0.009	1.000	
(13) <i>CEOD</i>	0.026	-0.001	-0.064	0.043	-0.006	0.055	-0.091*	0.050	0.039	-0.017	0.016	-0.063	1.000

**Note(s):** \*, \*\* and \*\*\* indicate statistical significance at 10, 5, and 1% levels, respectively. Variables are as defined in [Table 1](#)

**Source(s):** Authors' own work

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