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## Article

# Do CEOs' demographic characteristics affect firms' risk-taking? Evidence from Jordan

Cogent Business & Management

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*Suggested Citation:* Bsoul, Ruba; Atwa, Rawan; Odat, Mahmoud; Haddad, Lara; Shakhathreh, Mamoun (2022) : Do CEOs' demographic characteristics affect firms' risk-taking? Evidence from Jordan, Cogent Business & Management, ISSN 2331-1975, Taylor & Francis, Abingdon, Vol. 9, Iss. 1, pp. 1-16,  
<https://doi.org/10.1080/23311975.2022.2152646>

This Version is available at:

<https://hdl.handle.net/10419/289392>

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**To cite this article:** Ruba Bsoul, Rawan Atwa, Mahmoud Odat, Lara Haddad & Mamoun Shakhathreh (2022) Do CEOs' demographic characteristics affect firms' risk-taking? Evidence from Jordan, Cogent Business & Management, 9:1, 2152646, DOI: [10.1080/23311975.2022.2152646](https://doi.org/10.1080/23311975.2022.2152646)

**To link to this article:** <https://doi.org/10.1080/23311975.2022.2152646>



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Received: 25 October 2022  
Accepted: 24 November 2022

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## ACCOUNTING, CORPORATE GOVERNANCE & BUSINESS ETHICS | RESEARCH ARTICLE

# Do CEOs' demographic characteristics affect firms' risk-taking? Evidence from Jordan

Ruba Bsoul<sup>1</sup>, Rawan Atwa<sup>1</sup>, Mahmoud Odat<sup>1</sup>, Lara Haddad<sup>2\*</sup> and Mamoun Shakhathreh<sup>3</sup>

**Abstract:** The upper echelons theory suggests that directors' characteristics, values, and professional experience have an impact on their perceptions, and thus their own decisions. Building on this theory, this study aims to examine the impact of CEOs' demographic characteristics on firms' risk-taking. The analysis is based on a sample of 82 manufacturing and service companies listed on the Amman Stock Exchange for the period 2015–2019. The CEO characteristics examined include gender, age, qualification, experience, ownership, duality, and tenure. Though, we use the standard deviation of the firm's return on assets ratio as a measure for risk-taking. The results indicate that there is a significant negative relationship between CEO qualification, experience, ownership, and Jordanian firms' risk-taking. While there is a significant positive relationship between CEO tenure and Jordanian firms' risk-taking. Importantly, CEO gender, age, and duality are unrelated to firms' risk-taking in Jordan. This study contributes significantly to the existing, but limited, literature that examines the relationship between the CEOs' demographic characteristics and firms' risk-taking. It is worth noting that, this The study is the first in Jordan to investigate the impact of the CEOs' demographic characteristics on firms' risk-taking and document the above-mentioned relationships. The findings of the study could bring the attention of the standard setters and regulators to the importance of CEOs' attributes on controlling the mechanisms of the firms' risk-taking, and thus enable Jordanian companies to take the right decisions in relation to CEO appointments, as such decisions would certainly affect the company's performance and sustainability in the long-run.

**Subjects:** Accounting; Financial Accounting; Risk Management

**Keywords:** CEO characteristics; Duality; Performance; Risk-taking; Tenure

**Subjects:** M12; M41

### 1. Introduction

The firm's performance reflects the efficiency of the various decisions taken by the management of the firm, particularly, in using its assets to maximize the wealth of shareholders. These managerial decisions rest mainly with the Chief Executive Officers (CEOs) who are the formal leaders of the company, and their decisions are used as a basis for their evaluation which are reflected ultimately in the reported profits, and the stock price of the company. There are several factors that might affect the CEO' decision-making process and performance. For example, according to the human capital theory, individuals' education, experience, and skills outline their perception and

productivity and henceforth promote firm performance (Terjesen et al., 2009). In addition, from the upper echelon theory's point of view, the managers' decisions are likely to be shaped by their values and social and psychological characteristics. In highly competitive markets, however, in order to achieve high performance, managers may choose to make risky decisions (Hoskisson et al., 2017), which can affect the growth and survival of their companies.

In fact, the risk-taking level is a critical determinant of the company's success as it affects the company's performance, investments, growth, and sustainability (Damodaran, 2007; Hiebl, 2012). Further, the company's risk-taking level is primarily the outcome of decisions made by the CEOs who are involved in the decision-making process, and their personal characteristics clearly influence these decisions. Thus, the analysis of the CEOs' demographic characteristics might help to determine the key factors that impact the company's risk behaviors (Martino et al., 2020). Therefore, this research aims to examine the relationship between the CEOs' demographic characteristics and firms' risk-taking. Particularly, we investigate the impact of CEO gender, age, qualification, experience, ownership, duality, and tenure on firms' risk behavior using a sample of Jordanian manufacturing and service companies listed on the Amman Stock Exchange (ASE).

A review of previous literature shows that there is an extensive amount of literature that explores the influence of CEOs' characteristics on firm performance (e.g., Kaur & Singh, 2019), innovation and stock return (e.g., You et al., 2020), corporate environmental performance (e.g., Tran & Pham, 2020), corporate sustainable development (e.g., Huang, 2013), leverage (e.g., Nilmawati et al., 2021), internationalization (e.g., Saeed & Ziaulhaq, 2019). However, there is a very limited amount of literature that inspects the impact of CEOs' characteristics on corporate risk-taking (e.g., Faccio et al., 2016; Farag & Mallin, 2018). Farag and Mallin (2018) contend that the CEOs' demographic characteristics are the key determinants of their overconfidence and hubris, and this has implications for firm risk-taking. As a result, in this research, we focused on the demographic characteristics of CEOs and their impact on the firms' risk-taking in Jordan, where most of the previous literature has mainly focused on the impact of CEOs' characteristics on accounting conservatism (e.g., Makhoul et al., 2018), real earnings management (e.g., Alhmoode et al., 2020), audit quality (e.g., Alawaqleh et al., 2021). However, to the best of our knowledge, there is no single study in Jordan that has examined the relationship between CEOs' demographic characteristics and the firms' risk-taking. Our paper may give shareholders valuable insights as they usually prefer to appoint the most competent chief executive officers with the relevant abilities to maximize their wealth and enhance the competitiveness of Jordan internationally.

The remainder of the paper is structured as follows. Section 2 presents the literature review and hypotheses development. Section 3 presents the research methodology. Section 4 presents the results of our empirical analysis, Section 5 discuss the result and finally, Section 6 concludes the paper.

## 2. Literature review and hypotheses development

### 2.1. Theoretical perspectives

Our discussion of the association between CEO characteristics and corporate risk-taking is based on three theoretical perspectives. First, the upper echelons theory suggests that directors' characteristics, values, and professional experience have an impact on their perceptions, and thus their own decisions (Gala & Kashmiri, 2022; Sanders & Hambrick, 2007). That is, their decisions are based on their behavioral, social, and psychological characteristics (D.C. Hambrick & Mason, 1984; Farag & Mallin, 2018). This theory presumes that CEOs have bounded rationality and that their discretion is highly affected by cognitive, social, and psychological factors. Therefore, organizational strategic choices and performance, to some extent, can be predicted by the background characteristics of their managers (D.C. Hambrick & Mason, 1984). In this respect, several studies have adopted this theory to examine the association between CEOs' demographic characteristics with some aspects of decision-making, such as corporate risk-taking (Farag & Mallin, 2018), research and development

spending (Barker & Mueller, 2002), corporate takeover (Li & Tang, 2010); innovation (Kitchell, 1997); financial disclosure (Bamber et al., 2010), and cash holdings behavior (Orens & Reheul, 2013).

Second, the resource dependence theory suggests that boards with diverse backgrounds help to enhance the company's legitimacy and simplify its access to different resources such as information, communication, and expertise (Pfeffer & Salancik, 1978). Thus, we suggest that diverse CEO characteristics i.e., gender and education can create different perspectives, experiences, and backgrounds for the board; for example, the existence of female CEO on the board generates different benefits and resources for the firm (Vo et al., 2021).

Third, the human capital theory, states that individuals' education, experience, and skills outline their perception and productivity and henceforth promote the company's performance (Terjesen et al., 2009). Therefore, from the human capital theory perspective, different human capital means different backgrounds and different experiences for the board of directors (Hillman et al., 2000). In addition, Mateos de Cabo et al. (2012), assert that more diversified boards are better than homogeneous ones. For example, female directors have different perspectives and opinions than male directors. Farag and Mallin (2018) contend that more diverse boards have better management quality that assists the firm in addressing various environmental challenges.

## **2.2. CEOs' demographic characteristics and firms' risk-taking**

Based on the upper-echelon theory and the related research on the role of CEO characteristics in the decision-making process, we examine the association between CEOs' demographic characteristics and firms' risk-taking behavior. The CEO characteristics examined include age, gender, education, ownership, duality, professional experience, and tenure.

### **2.2.1. CEO gender**

The resource dependence theory suggests that female directors bring different perspectives and experiences to the board. However, according to a report by the World Bank, although women made up about 39% of the global workforce in 2021, very few women end up in leadership positions. The Forbes magazine also reported that within the largest 500 companies around the world; only 8% are headed by women in 2021 and that men occupy most of the superior positions (Ghazi, 2022). Despite the little presence of female directors at the level of corporate directors and executives, prior research has examined whether female executives are differently associated with risk-taking than male executives. That is, whether the willingness to take risks is influenced by the gender of the CEO. For example, Muhammad et al. (2022), using a sample of 192 non-financial publicly traded Italian firms over the years 2014–2018, found that female CEOs are associated with less risk-taking than male CEOs. Vo et al. (2021) also investigated the effect of CEOs' gender on the performance and risk of Vietnamese-listed firms. On one hand, they found that men are more overconfident and that firms led by men CEOs experience more systematic and idiosyncratic risks than firms led by women. On the other hand, they found that male CEOs achieve lower profitability compared with female CEOs. They suggested that women generate more benefits to the firm because they display unique work styles, experiences and perspectives. Farag and Mallin (2018) studied the effect of gender using a sample of 892 IPOs listed on Shanghai and Shenzhen Stock Exchanges. The results indicate that female CEOs are not risk averse. In addition, based on a sample of 132,590 firms from 41 countries covered in Amadeus for the year 1999–2009, Faccio et al. (2016) suggest that female CEOs are more likely to try to maintain their positions, so they are risk-avoidance, and that they have lower leverage ratios in their firms and less volatile earnings. Finally, Aabo and Eriksen (2018) used a sample of 475 US manufacturing firms in the period 2010–2014, they suggested no significant relationship between CEOs gender and corporate risk-taking.

### **2.2.2. CEO age**

It can be argued that younger CEOs may attempt to achieve high profits and high growth by taking risky decisions, as they are less skilled and professionally experienced (Bertrand & Schoar, 2003). Younger CEOs may also take risky decisions in their attempts to preserve their name in

the marketplace. On the other hand, older CEOs are expected to be more conservative and tend to be traditional in their management style; they are less likely to take audacious decisions (D.C. Hambrick & Mason, 1984). However, empirical research on the association between CEO age and the risk-taking activities provides mixed results. Loukil and Yousfi (2022) found a positive association between the age of the CEOs of non-financial firms listed on the SBF120 index in Singapore and financial risk-taking, proxied by the firm leverage ratio. This indicates that the CEOs in the sample firms are more incited to indebt firms, maybe because they are of middle age (on average 55 years old). Yeoh and Hooy (2020) show that publicly listed family firms' CEOs in Malaysia tend to undertake riskier activities at younger ages and in their 60s, but less risky investment decisions when they are in their 40s. Ferris et al. (2019) show a significant negative relationship between CEOs' age and corporate risk-taking over a sample of 12,000 firm-year observations around the world during the period 1999–2012. Farag and Mallin (2018) also indicate that younger CEOs in China are more likely to consider risky decisions than older CEOs. On the other hand, Yousfi et al. (2022) suggest a positive association between CEOs' age and financial risk-taking. Aabo and Eriksen (2018) found no significant association between CEO age and corporate risk-taking in the USA.

### 2.2.3. CEO qualification

Anderson et al. (2011) argue that CEOs' educational level induces different viewpoints, perspectives, and professional developments in a company, its board, and decisions. Several studies suggest that highly educated CEOs could better deal with new technology and ideas as well as have a better understanding of complex decisions (e.g., Farag & Mallin, 2018; Li et al., 2017; Martino et al., 2020; Yousfi et al., 2022). As a result, they prefer innovative projects and investment opportunities with an open eye to new changes.

The literature on CEOs' qualifications found mixed results. Martino et al. (2020) analyzed a sample of 107 Italian family firms listed on Milan Stock Exchange to investigate the influences of CEOs traits on firms' strategic risk-taking. They showed that risk-taking is significantly and negatively relates to CEOs professional educational level. Their result contradicts the result of Farag and Mallin (2018) which indicates a highly significant and positive relationship between CEOs' higher education and corporate risk-taking in China. According to Ramón-Llorens et al. (2017), CEOs educational level is positively related to family firms' ability to internationalize. Their conclusion is based on a survey dataset of 187 Spanish family firms during the months of February and March for the year 2011. Finally, Loukil and Yousfi (2022) documented a non-significant relationship between CEOs education and risk-taking. They suggest that postgraduate CEO qualifications have no impact on stock return volatility.

### 2.2.4. CEO experience

Orens and Reheul (2013), and Koellinger (2008) argue that CEOs with prior experience have a higher potential to take risky decisions because they are more open-minded, encourage innovation, and prefer challenges. Additionally, they are more competent to deal with new risky ideas. CEOs' experience represents a good indicator of their knowledge, values, skills, and a valid illustration of their activity and strategic choices (Herrmann & Datta, 2006). Therefore, greater CEOs experience would provide them with additional skills in making broader perspective decisions (Zhang & Rajagopalan, 2010). In this regard, Loukil and Yousfi (2022) found that when CEOs have previous professional experience, their firms tend to have lower leverage ratios, indicating that less risk is prone. However, according to Martino et al. (2020), risk-taking by the CEOs of Italian family firms has no association with their prior experience. Farag and Mallin (2018) provide evidence of a significant positive association between CEOs' previous experience and corporate risk-taking. Their finding suggests that CEOs with previous experience outside their company tend to take advantage of new opportunities and be more innovative, thus they are willing to take more risk.

#### 2.2.5. CEO ownership

Agency theorists believe that one way to maximize shareholders' equity and reduce agency costs is by encouraging firms' directors to own their firms' equity (Jensen & Meckling, 1976). This can be achieved by compensating directors with firm equity. By owning the firm's equity, CEOs would be interested in maximizing their return on equity, which would induce them to invest in value-enhancing initiatives, and this would benefit the company in the long run (Jenkins & Seiler, 1990). In their process of increasing their return, however, CEOs with large ownership have stronger motives to undertake risky investments than non-shareholding managers (Laeven & Levine, 2009). In other words, it can be said that high CEO ownership would encourage extreme performance and involvement in risky activities, therefore exposing firms to high losses (Sanders & Hambrick, 2007).

Yusuf et al. (2022) investigated the effect of CEO ownership on the risk-taking of 12 listed deposit money banks in Nigeria for the period 2009–2019. They showed that CEOs' ownership significantly and positively influences risk-taking. Devarajan et al. (2022) also showed that CEOs' institutional ownership positively and significantly affects the managerial risk-taking of 362 publicly listed companies in Malaysia during the period 2013–2019. Similarly, Mathew et al. (2016) found that high equity CEOs ownership can increase firm risk. Their research is based on an unbalanced panel of 260 companies' secondary data on the FTSE 350 index in the UK, for the period from 2005 to 2010. Finally, Farag and Mallin (2018) found no significant relationship between CEOs ownership and risk-taking.

#### 2.2.6. CEO duality

The relationship between corporate governance and risk-taking has been widely examined. Regarding duality, prior literature offers different arguments about the role of the CEOs' duality on firms' risk-taking willingness. There is a point of view that says that the ability to take the right decision by the CEO is negatively affected by the presence of duality, that is, because CEOs will ignore their role on the board to control and regulate the management, the firm would be directed to expand risk-taking activities. In the absence of duality, CEOs will take more effective decisions, since they will allocate resources more efficiently taking into account the least risk possibilities (Sayari & Marcum, 2018). Attia et al. (2020) argue that the existence of CEOs as the head of the board directs them to participate in the formation of business strategies (such as research and development), therefore, increasing their power, which may affect their risk-taking behavior. Chen and Zheng (2014) argue that duality empowers CEOs to have more support and control and to get entrenched, so they become less likely to behave in a risky manner. However, from the point of view of Anderson et al. (2011), the risk-taking decisions by CEOs are affected by the time spent having dual positions.

Hop (2022) analyzed data for 40 cooperatives (mutually owned) banks as well as 40 listed commercial banks to examine whether they face the same agency problem regarding CEO duality and risk-taking. The findings are different in each group. While a positive association between CEOs duality and risk-taking is found within the listed banks, this association is negative within the cooperative banks. Farag and Mallin (2018) and Loukil and Yousfi (2022) provide evidence of a positive relationship between CEOs' duality and risk-taking. Muhammad et al. (2022) suggest that CEO duality is positively associated with firms' unsystematic risk, but negatively linked with systematic risk. Finally, analyzing data from a sample of 116 listed banks in 10 Asian emerging economies for the period 2010–2018, Hunjra's (2021) findings indicate that CEOs' duality positively and significantly affects bank risk-taking.

#### 2.2.7. CEO tenure

Previous literature provides two points of view related to CEO tenure. On the one hand, newly appointed CEOs strive to maintain their positions, and to achieve this they do their best to improve the firm's performance and gain the trust of the board members. As a result, they will tend to be more conservative in their decisions (Loukil & Yousfi, 2022). Others argue that short-tenured CEOs

tend to adopt new ideas and changes in order to prove themselves and therefore they would not mind being involved in new experiences or even taking innovative risky alternatives. This argument is supported by Farag and Mallin (2018) who find a significant and negative relationship between CEO tenure and corporate risk-taking within the Chinese IPOs. Both Ferris et al. (2019) and Orens and Reheul (2013) also found that short-tenured CEOs tend to be more willing to risk-taking.

Regarding long-tenured CEOs, some argue that when the CEO period is long, their main concern will not be to improve their image in the eyes of the board (Yousfi et al., 2022; Loukil & Yousfi, 2022). Therefore, they become less likely to undertake risky activities because they are already enjoying high levels of control over the firm (Chen & Zheng, 2014), they have more capabilities to resist board pressure (Loukil & Yousfi, 2022), or because they are entrenched within the firm and have greater managerial power (Laeven & Levine, 2009). Fukutomi (1991) argue that when CEOs' tenure becomes longer, they become more committed and in compliance with the company's strategy, their conviction and plans become more oriented to the efficient management of their companies. As a result, they become less willing to pursue entrepreneurial initiatives, so they prevent violating the current status of norms and practices. In turn, they become less likely to be risk-taking and their information sources will be restricted and increasingly narrow (Finkelstein & Hambrick, 1996), resulting in withholding the primary source of information and prohibiting the firms from entrepreneurial activities stimulation. This argument is empirically supported by Loukil and Yousfi (2022), Farag and Mallin (2018), and Zahra (2005) who show a negative and significant link between CEOs' tenure and risk-taking.

Despite the above findings, Martino et al. (2020) and Yusuf et al. (2022) document no significant relationship between CEOs' tenure and risk-taking, while Chen and Zheng (2014) and Yeoh and Hooy (2020) document a significant positive relationship between CEOs tenure and risk-taking. As mentioned earlier, although several studies have examined the relationship between CEOs characteristics and corporate risk-taking, to the best of our knowledge, there is no one singular study about Jordanian firms. To fill this gap, this research aims to examine the impact of the CEOs' demographic characteristics (e.g., gender, age, qualification, experience, ownership, duality, and tenure) on Jordanian firms' risk-taking based on a sample of manufacturing and service firms listed on Amman Stock Exchange (ASE). For this purpose, we developed seven hypotheses as follows:

- H1: Firms' risk-taking level is significantly associated with the CEOs' gender.
- H2: Firms' risk-taking level risk-taking is significantly associated with the CEOs' age.
- H3: Firms' risk-taking level is significantly associated with the CEOs' qualifications.
- H4: Firms' risk-taking level is significantly associated with the CEOs' experience.
- H5: Firms' risk-taking level is significantly associated with the CEOs' share ownership.
- H6: Firms' risk-taking level is significantly associated with the CEOs' duality.
- H7: Firms' risk-taking level is significantly associated with the CEOs' tenure.

### 3. Research method

#### 3.1. Sample and data collection

Our analysis is based on a sample of manufacturing and service firms listed on the Amman Stock Exchange (ASE) for the financial years 2015–2019. We chose to examine only two years' data

because we believe that the CEO's attributes examined do not change considerably by the passage of time and, therefore, adding more years would not add value to the analysis. In addition, we select 2015 and 2016 as we need at least 4 years ahead data, as will be discussed later, to calculate the risk variable. Further, the financial sector firms are excluded from the analysis because they are subject to certain regulations and laws which may affect the results. Additionally, we exclude firms that do not have the complete data about the independent and dependent variables. The data related to the study variables were collected from the Jordanian Securities Depository Center (SDC) website, the ASE website, and from the firms' annual reports for the financial years involved. The final sample consists of 82 companies with 164 firm-year observations.

### **3.2. Variable definition and measurement**

#### **3.2.1. Dependent variables**

Firms' risk-taking is the dependent variable in our analysis. Prior research has employed several measures to quantify this variable, such as the standard deviation of the firm return on assets ratio, the standard deviation of the firm stock return, the research and development expenditures, leverage, and the standard deviation of the firm Tobin's Q ratio (Ferris et al., 2019; Faccio, 2016; Loukil & Yousfi, 2022; Martino et al., 2020; Muhammad et al., 2022; Vo et al., 2021). In the current research, we employ the standard deviation of the firm return on assets ratio as our measure of risk-taking. The standard deviation of return on assets is an indication of the firms' earning volatility, that is, riskier operations result in more volatile earnings (Zhang, 2009). According to Ferris et al. (2019) and Faccio et al. (2016), earning volatility captures the firms' risky investment decisions. We calculate the return on assets ratio for each firm for at least four years ahead of the current year by dividing earnings before interest and tax (EBIT) over total assets, and then we compute the standard deviation of ROA over the related period.

#### **3.2.2. Independent variables**

The independent variables in our study are the CEOs' attributes. CEO gender is captured as a dummy variable that takes the value 0 if the CEO is female and 1 otherwise (Muhammad et al., 2022; Vo et al., 2021). CEO age and qualifications are used following Loukil and Yousfi (2022) and Gala and Kashmiri (2022); age is determined as the difference between the year of observation and CEO birth year, while CEO qualifications are given the value of 3 if the CEO has a Ph.D. degree, 2 if he has a Master, 1 if he has bachelor's degree, and 0 otherwise. We also include CEO experience and measure it as the total number of years that the CEO served as a CEO during his life even if in different companies. As in Muhammad et al. (2022) and Farag and Mallin (2018) we include CEO ownership and duality. CEO ownership is determined as the percentage of share of capital owned by the CEO to total assets of the firm, while the duality is used as a dummy variable equal to 1 if the CEO also holds the chairman of the board position and "0" if not. Finally, we include CEO tenure which is represented by the total number of years that the CEO has held the CEO position within the company (Yousfi et al., 2022; Martino et al., 2020).

#### **3.2.3. Control variables**

To be consistent with prior research, we control for the effect of several factors that have been evidenced to affect Firms' risk-taking. Return on assets (ROA) is used by Loukil and Yousfi (2022), Aabo and Eriksen (2018), and Mathew et al. (2016), to control for differences in management quality. According to Loukil and Yousfi (2022), ROA is likely to affect corporate risk-taking. The book-to-market value ratio (BMV) is used by Vo et al. (2021) and Ferris et al. (2019) to control for differences in investment opportunities which is used by investors in the process of evaluating the company's value. Investors take their investment decision according to their willingness to pay a premium according to their expectations about the future profit that a company will generate. Barth et al. (2022) found that BMV is likely to reflect risk since it is more sensitive to the expected market risk premiums. Firm size is also included as a control variable following Gengatharan et al. (2020) who document a positive association between the level of risk and the company's size. The

natural log of total assets is used to represent the firm's size. Firm size is an element that highly and significantly affects the activities of a company, accordingly, several studies include it as a control variable (e.g., Gala & Kashmiri, 2022; Loukil & Yousfi, 2022; Muhammad et al., 2022; Vo et al., 2021). Finally, we include the firm leverage ratio which is calculated by dividing total debt by total equity. An increase in debt compared to equity is expected to influence the company's performance. In corporate finance, leverage is used as a risk measure (Faccio et al., 2016) since the higher the leverage ratio, the higher the default probability. As a result, the greater the negative impact on the firms' net profitability expectations which, in turn, negatively affects the firms' underlying business conditions (Faccio, 2016). Leverage is included in several studies as an indication of risk-taking willingness (e.g., Aabo & Eriksen, 2018; Devarajan et al., 2022; Mathew et al., 2016; Muhammad et al., 2022).

### 3.3. Regression model

In order to examine the relation between firms' risk-taking and CEOs attributes, the following regression model has been developed:

$$RISK_{i,t} = \beta_0 + \beta_1 GDR_{i,t} + \beta_2 AGE_{i,t} + \beta_3 QUAL_{i,t} + \beta_4 EXP_{i,t} + \beta_5 OWN_{i,t} + \beta_6 DUAL_{i,t} + \beta_7 TENR_{i,t} + \beta_8 ROA_{i,t} + \beta_9 BMV_{i,t} + \beta_{10} SIZE_{i,t} + \beta_{11} LEV_{i,t} + \varepsilon$$

Where:

<i>RISK</i> :	Firm <i>i</i> risk-taking in year <i>t</i> .
<i>GDR</i> :	Gender of firm <i>i</i> CEO in year <i>t</i> .
<i>AGE</i> :	Age of firm <i>i</i> CEO in year <i>t</i> .
<i>QUAL</i> :	Qualifications of firm <i>i</i> CEO in year <i>t</i> .
<i>EXP</i> :	Experience of firm <i>i</i> CEO in year <i>t</i> .
<i>OWN</i> :	Share ownership of firm <i>i</i> CEO in year <i>t</i> .
<i>DUAL</i> :	CEO duality for firm <i>i</i> in year <i>t</i> .
<i>TENR</i> :	CEO tenure for firm <i>i</i> in year <i>t</i> .
<i>ROA</i> :	Return on assets ratio for firm <i>i</i> in year <i>t</i> .
<i>BMV</i> :	Book to market value ratio for firm <i>i</i> in year <i>t</i> .
<i>SIZE</i> :	Natural Logarithm of total assets for firm <i>i</i> in year <i>t</i> .
<i>LEV</i> :	Leverage ratio for firm <i>i</i> in year <i>t</i> .
<i>E</i> :	Error term.

## 4. Data analysis

### 4.1. Descriptive statistics

Table 1 below presents descriptive statistics for all the variables included in the study. Regarding the dependent variable, *RISK*, the average variation in the sample firms' return on assets for four years' period, which measures the risk faced by these firms, is 6.18% with a standard deviation of 11.25 %. This indicates that these firms vary regarding their risk-taking propensity. The minimum and maximum values for the individual firms in the sample were 0.15% and 87.83% respectively.

Regarding the dependent variables, Table 1 shows that nearly 99% of the CEOs within the sample firms are males. This is due to the Jordanian culture regarding the occupation of such positions by women. This result is close to the findings of Alqatamin et al. (2017) which indicate that 95% of Jordanian firms are managed by a male. In fact, this result is found, not only in Jordan, but also in other countries around the world. For example, according to Grant Thornton International Business Report in 2012, female CEOs are only about 6% in both the United Kingdom and the United States. Additionally, it is around 5% in the United Arab Emirates. As for

**Table 1. Descriptive statistics**

Variable	Mean	S. Dev	Min	Max
<b>RISK</b>	0.061892	0.112509	0.001586	0.878330
<b>GDR</b>	0.988889	0.110092	0	1
<b>AGE</b>	55.36585	11.06313	28	81
<b>QUAL</b>	1.378049	0.720263	0	3
<b>EXP</b>	9.823171	11.03866	1	53
<b>OWN</b>	0.018077	0.070183	0	0.589151
<b>DUAL</b>	0.134146	0.341853	0	1
<b>TENR</b>	7.640244	9.847230	1	53
<b>ROA</b>	0.027677	0.214678	-1.981033	0.892838
<b>BMV</b>	1.462089	1.354550	-0.049436	7.518797
<b>SIZE</b>	7.421221	0.657436	5.596372	9.108294
<b>LEV</b>	0.372271	0.270747	0.002830	1.796214

the age variable, the data shows that the average age of the CEOs of the sample firms is nearly 55 years. The youngest CEO is 28 years old and the oldest is 81 years old. This is consistent with the results reported by Qawasmeh and Azzam (2020) which indicate that the average CEO age is around 52.42 years. Regarding the CEOs qualifications, the results indicate that the CEOs of the firms included in the sample hold, on average, a post-graduate qualification, the mean and standard deviation for this variable are 1.37 and 0.72, respectively. The results regarding the CEOs' experience indicate that the average number of years that the CEOs of the sample firms served on average of 10 years as a CEO of a company. This period ranged from 1 to 53 years. This is in line with Qawasmeh and Azzam (2020) which indicate that 97% of current CEOs have past experiences. The CEOs' share ownership in their companies has an average of 1.80% and varies significantly between the companies at a range from 0 to approximately 59%. This percentage, however, is slightly smaller than the percentage reported by Qawasmeh and Azzam (2020) who indicate that the CEOs' ownership is about 3.4%. In addition, our results indicate that on average 13.5 % of the CEOs serve also as chairmen of the board of directors of the service and manufacturing firms in Jordan. Our result is much higher than 0.46% of the average duality reported by Kanakriyah (2021) for the service and manufacturing firms in Jordan. Finally, the average tenure of the CEOs is almost 7.64 years, with the longest period in office of 53 years and the lowest period of 1 year. This result is in line with previous studies such as Martion et al. (2020) which reported that the average Italian CEOs tenure is nearly 7 years.

The statistics regarding the control variables show that the mean and standard deviation of ROA are 2.76% and 21.46%, respectively. Thus, on average, Jordanian service and manufacturing firms earn a return of 2.76% of their total assets. In addition, the sample firms BMV has an average of 1.46 with a 135 % standard deviation. When proxied by the natural logarithm of total assets, the average firm size is 7.42 with a 0.657 standard deviation. Finally, the mean (standard deviation) of firm leverage is 37.22% (27.07%), which indicates that the non-financial firms listed on ASE are financed 37% through debt.

#### 4.2. Correlation analysis

Table 2 below presents the Pearson correlation coefficients among all the variables. It shows that CEO AGE has a positive correlation with TENR and EXP. A positive correlation also appears between OWN and DUAL. In addition, OWN is negatively correlated with QUAL. The positive correlations between AGE, TENR and EXP are logical and straightforward; as time passes (increase in CEO age), life and job experience gained by the CEOs increase and so does tenure which represents the period that the CEO has occupied the current position. All the correlation coefficients between the independent variables are less than 0.70 except that between EXP and TENR, (0.8975). To confirm

Table 2. Pearson Correlation Matrix

	RISK	GDR	AGE	QUAL	EXP	OWN	DUAL	TENR	ROA	BMV	SIZE	LEV
RISK	1											
GDR	-0.0505	1										
AGE	-0.0354	-0.0590	1									
QUAL	-0.0575	0.0962	-0.0490	1								
EXP	0.0153	-0.0184	0.3092	0.0717	1							
OWN	-0.0655	-0.0287	0.0434	-0.2914	-0.1389	1						
DUAL	-0.0491	-0.0437	0.2026	-0.1324	0.0664	0.3291	1					
TENR	0.0027	0.0040	0.3126	0.1049	0.8975	-0.1207	0.1383	1				
ROA	-0.5879	0.0091	0.0019	-0.0108	-0.0407	-0.0248	0.1054	0.0133	1			
BMV	0.0554	0.1336	-0.0121	-0.0842	0.2443	-0.0528	0.2082	0.2992	0.0714	1		
SIZE	-0.3832	0.0885	0.1033	0.0829	0.1395	-0.2651	-0.0468	0.1862	0.2954	0.1345	1	
LEV	0.0887	0.0193	0.0331	-0.0135	0.0041	0.1045	-0.0689	0.0535	-0.0199	-0.1023	-0.0076	1

that there is no multicollinearity problem that may affect the analysis, we calculate the variance inflation factor (VIF) as shown in the last column in Table 3 which indicates that there is no multicollinearity since all the value of VIF is less than 10 (Gujarati, 2003).

#### 4.3. Regression analysis

To examine the link between firms' risk-taking and CEO traits, the multiple regression technique is used to analyze the data. A summary of the results is presented in Table 3. The F-statistic confirms the validity of the regression model for the analysis, which is statistically significant at the 5% level ( $p < 0.05$ ). In addition, the  $R^2$  value of 0.451 indicates that the variables included in the model explain 45% of the variation in firms' risk-taking.

Table 3 shows the regression coefficients on all the independent variables and the control variables. The coefficients on both *GDR* and *AGE* are statistically insignificant ( $p$ -value = 0.311 and 0.850, respectively), and thus, we reject hypotheses 1 and 2, and accept the alternative ones that CEOs' gender and age are not associated with firms' risk-taking. The data also shows that the coefficients on *QUAL* and *OWN* are negative and statistically significant at the 1% level and the coefficient on *EXP* is negative and statistically significant at the 10% level. This induces us to accept hypotheses 3, 4 and 5. Therefore, according to these results, the firms' risk-taking willingness decreases with the level of the CEO qualifications, experience and share ownership. The coefficient on *DUAL* is positive but statistically insignificant, and accordingly, hypothesis 6 that states that CEO duality is negatively related to risk-taking is rejected. Finally, the coefficient on the last independent variable, *TENR*, is positive and statistically significant at the 10% level. Based on this result, we accept the seventh hypothesis and conclude that an increase in CEO tenure will lead to an increased involvement in risky behavior.

Finally, regarding the control variables, the coefficients on *ROA* and *SIZE* are negative and significant indicating that an increase in firms return on asset and size lead to a reduction in the firms' risk-taking propensity. The coefficient on *BMV* suggests that firm's book-to-market ratio and risk-taking is positively and significantly associated. However, there is no relationship between leverage and firms risk taking as indicated by the insignificant coefficient on the *LEV* variable.

#### 5. Discussion

The results indicate that firms' risk-taking is not associated with CEOs' gender and age. These results, however, are consistent with the results of Ferris et al. (2019) which also found no link between the gender and age of the CEO and the firms' risk-taking. The results obtained can be due to the specification of our sample where, as reported in the descriptive statistics, most of the CEOs are males and of middle age. The results show that firms' risk-taking is negatively related to the educational level of the CEO. Indeed, when the educational level increases, the firms' risk-taking decreases, and vice versa. This is an endorsement of the upper echelon theory, and the argument that higher CEOs' education (Ph.D. MBA and Bachelor's) induces them to be less willing to risk-taking because as they become more and more educated, they will be directed to avoid making mistakes and losses, and strive for the firm's development in the long run. This result is similar to Martino et al.'s (2020) finding which revealed a significant and negative association using the standard deviation of the firm Tobin's Q ratio as a risk-taking proxy. Contrarily, the findings of Farag and Mallin (2018) indicate the existence of a significant positive association between CEO Qualification and firm risk-taking using two other proxies, whereas Loukil and Yousfi (2022) found no association between CEO qualifications and five different risk-taking proxies used.

The results also show that as CEOs become more experienced, they become less risk-taking. Being more experienced, CEOs may tend to adopt a conservative leadership approach and become more conventional in their management of the firm, which in turn would reduce the volatility of the firm's operating ROA. Loukil & Yousfi's (2022) findings also provide evidence of a negative and significant link between CEOs' experience and firms' risk-taking using five different risk-taking measurements. On the other hand, our result is inconsistent with Farag and Mallin (2018) which

**Table 3. Regression results**

Variables	Coefficient	t-stat	p-value	Tolerance	VIF
<b>GDR</b>	−0.0392	−1.015	0.311	0.955	1.047
<b>AGE</b>	−0.00007	−0.189	0.850	0.836	1.196
<b>QUAL</b>	−0.0127	−5.579***	0.000	0.872	1.147
<b>EXP</b>	−0.0012	−1.952*	0.052	0.182	5.480
<b>OWN</b>	−0.3093	−11.553***	0.000	0.742	1.347
<b>DUAL</b>	0.0064	0.558	0.577	0.766	1.305
<b>TENR</b>	0.0012	1.694*	0.092	0.172	5.816
<b>ROA</b>	−0.2740	−2.201**	0.029	0.885	1.129
<b>BMV</b>	0.0101	4.192***	0.000	0.805	1.242
<b>SIZE</b>	−0.0492	−4.662***	0.000	0.804	1.244
<b>LEV</b>	0.0434	1.316	0.190	0.945	1.058

F: 11.351

Sig. = 000

R<sup>2</sup> = 0.451

Adjusted R<sup>2</sup> = 0.411

\*\*\* The result is significant at 0.01 level ( $p \leq 0.01$ )

\*\* The result is significant at 0.05 level ( $p \leq 0.05$ )

\* The result is significant at 0.10 level ( $p \leq 0.10$ )

documented a significant positive association between CEO experience and firms' risk-taking, suggesting that long-experienced CEOs are more likely to take risky decisions, as they are encouraged to become more innovative and adopt riskier alternatives. Our result is also inconsistent with Martino et al. (2020) which found no relationship between CEO experience and firms' risk-taking propensity.

Regarding the CEO ownership of the firm's shares, the result indicates that large ownership reduces the risk-taking activities by the CEO, which may be due to the CEOs' tendency to protect their ownership from any losses, and therefore would not expose themselves to any type of risk. This finding is consistent with Faccio et al. (2016) results which show a negative relationship between CEO ownership and risk-taking using the standard deviation of ROA as a risk measure. However, when they use leverage as a risk measure, the relationship is significant but in the opposite direction. Our result contradicts Muhammad et al.'s (2022) findings which show a positive and significant association between ownership and risk-taking measure by the standard deviation of ROA.

The results also suggest that the CEO duality has no effect on the risk-taking willingness of the CEO. This result is consistent with Muhammad et al.'s (2022) findings by using our risk-taking proxy. In addition, Loukil and Yousfi (2022) found similar results using four different risk-taking proxies. On the other hand, Hunjra et al. (2021) shows a significant positive relationship between duality and two risk-taking proxies. Finally, Hop (2022) indicates that the relationship between duality and risk-taking differs in cooperative and listed banks. A positive association is found in listed banks, while a negative association is documented in cooperative banks.

Finally, the results of the present study indicate that the longer the period the CEO is in this position, the more likely he will be involved in risky activities. When CEOs occupy their positions for a long time, they establish their career and name in the marketplace, so they would not worry about losing their position and they would not be under pressure from the board of directors; therefore, they would be more willing to take risk as their managerial procedures will be more innovative and more receptive to new business ideas. This result is inconsistent with Ferris et al. (2019), Chen and Zheng (2014), Yusuf et al. (2022), and Martino et al. (2020), and Yeoh and Hooy

(2020) which revealed that tenure is not related to risk-taking, despite of using different risk-taking measures. Loukil and Yousfi (2022) used five risk-taking proxies and found that two measures are negatively and significantly associated with CEO tenure, while three measures are unrelated to CEO tenure.

## 6. Conclusions, limitation and recommendations

This study examined the link between the CEOs' demographic characteristics and firms' risk-taking, proxied by the volatility of annual earnings, within a sample of 82 services and manufacturing firms listed on ASE during 2015–2019. The empirical results indicate that Jordanian firms' risk-taking is negatively and significantly affected by CEO qualifications, experience, and ownership of the firm's shares. It is also negatively and significantly affected by the firm size and return on asset ratio. On the other hand, it is positively and significantly related to the CEO tenure and the firm's book-to-market ratio. However, no significant relationship is found between Jordanian risk-taking and each of the CEO's gender, age, duality as well as the firm leverage ratio.

The results indicate that an increase in the CEOs' educational level, experience as a CEO of a company, and share ownership reduces the CEOs' tendency toward risk-taking. Based on these findings, the board of directors should take these attributes into consideration when appointing the CEO as they will affect the performance of the company in the long run. In addition, the board of directors should pay more attention to the tenure factor as the results indicate that the risk-taking willingness of the CEOs would increase as the CEOs' tenure becomes longer and longer.

Based on the study outcomes, investors should pay attention to the CEOs' attributes when assessing firms' risk in their process of making investment decisions. Regulators also should be aware of the importance of CEOs' attributes to control the mechanisms of Jordanian firms' risk-taking. In addition, we recommend the board of directors to consider the CEOs' attributes carefully, such as tenure, as it may increase the likelihood of the CEO's involvement in risky activities, and therefore, expose the firm to dire consequences.

The study is limited in relation to the sample used which is relatively small and covers only two years of data. Therefore, the generalization of the results of the study should be done with caution. Since the study is the first Jordanian study that investigates the impact of CEO traits on firms' risk-taking, we think that there might be other CEO characteristics that may have an impact on firms' risk-taking and are omitted from the study, such as CEO integrity, overconfidence, equity-pay ratio, political connections, and compensations. Future researchers are recommended to apply similar studies by considering these characteristics.

### Funding

The authors received no direct funding for this research.

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### Disclosure statement

No potential conflict of interest was reported by the author(s).

### Citation information

Cite this article as: Do CEOs' demographic characteristics affect firms' risk-taking? Evidence from Jordan, Ruba Bsoul, Rawan Atwa, Mahmoud Odat, Lara Haddad & Mamoun Shakhathreh, *Cogent Business & Management* (2022), 9: 2152646.

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