

Article

The Impact of CEO Characteristics on Investment Efficiency in Jordan: The Moderating Role of Political Connections

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Abstract: This study investigates the impact of CEO characteristics—specifically CEO age, founder status, and family membership—on investment efficiency in Jordanian non-financial companies, with a focus on the moderating role of political connections. Drawing on the existing literature, we identify conflicting views regarding how these characteristics influence investment decisions. Some studies suggest that younger CEOs may adopt more aggressive investment strategies, while older CEOs tend to be conservative, leading to balanced resource allocation. Similarly, CEOs with founder status and family membership are thought to have an emotional attachment to the company, theoretically resulting in cautious investment behavior. However, empirical evidence remains mixed. By using data from 62 non-financial firms listed on the Amman Stock Exchange (ASE) from 2019 to 2023, this study employs regression analysis to explore these relationships. The findings reveal that CEO age contributes to investment efficiency by mitigating both over- and under-investment. Contrary to expectations, CEO founder status shows no significant effect on investment efficiency. Additionally, family-member CEOs exhibit a tendency toward under-investment, driven by a desire to preserve family wealth. Political connections further complicate these dynamics, encouraging riskier investment strategies while diluting the positive effects of CEO characteristics. These results provide new insights into the intricate interplay between CEO traits and political networks, contributing to the discourse on corporate governance in emerging markets. The study concludes with practical implications for policymakers and company boards, emphasizing the need for balanced leadership selection strategies to optimize investment efficiency.

Keywords: CEO characteristics; investment efficiency; founder status; family ownership; political connections; Jordanian companies



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1. Introduction

Investment efficiency is a key concern in corporate finance, particularly in emerging markets such as Jordan, where companies must navigate complex economic, cultural, and political landscapes. Investment efficiency refers to how effectively a firm allocates its resources to maximize returns and support long-term growth. Despite its importance, the factors that enhance or hinder investment efficiency remain contentious. Recent studies on investment performance have emphasized the role of policy linkages in shaping corporate decisions. These studies argued that governance frameworks, regulatory policies, and CEO characteristics could impact investment efficiency (e.g., [Smith et al. 2021](#); [Kouaib et al. 2022](#)). Moreover, the current literature identifies CEO characteristics—such as age, founder status, and family membership—as significant influencers of investment efficiency. However, the nature of these influences is still subject to debate, given the diverse and sometimes conflicting findings in this area ([Xie 2015](#); [Gan 2019](#); [Ullah et al. 2020](#)). Jordan's corporate

environment has a unique dynamic from those of developed economies. Companies are commonly owned by families and pronounce political affiliations that shape corporate governance and decision-making processes. In addition, the Jordanian market suffers from limited access to external capital, complex regulatory requirements, and recurring market fluctuations. This challenging environment establishes a distinct context within which factors influencing investment efficiency need closer examination.

Among the various CEO characteristics, age has been extensively examined for its impact on investment decisions. Some studies argue that younger CEOs are inclined to take more risks and adopt aggressive strategies, potentially leading to more efficient investments (Xie 2015; Gan 2019). However, this risk-taking tendency can sometimes result in over-investment and inefficiencies (Chowdhury et al. 2023). In contrast, older CEOs are often associated with a more conservative approach, favoring balanced resource allocation to reduce the likelihood of over- or under-investment (Lai et al. 2020). These conflicting perspectives highlight a need to explore how CEO age affects investment efficiency in specific cultural and economic contexts, such as that of Jordan.

CEO founder status introduces another layer of complexity. Founders often possess a deep emotional attachment to their company and a long-term vision for its success, which theoretically guides them toward cautious and efficient investment strategies (Meier and Schier 2021; Wang et al. 2022). Nonetheless, some research challenges this notion, suggesting that founders' strategies may change over time, leading to reduced investments in key areas such as research and development (Hsu et al. 2020). This inconsistency suggests that the influence of CEO founder status on investment efficiency is not yet fully understood, especially in the Jordanian market.

The role of CEOs who are family members in family-owned companies is another significant but under-explored factor in investment decision-making. Family-based CEOs often prioritize preserving family wealth and reputation, which can result in more cautious investment behaviors (Delgado-García et al. 2023). In Jordan, family businesses are known to focus on their reputation, shaping their approach to investments (Bataineh et al. 2018). Despite this, the literature has not comprehensively examined how the status of a CEO as a family member directly impacts investment efficiency in Jordanian companies. Addressing this gap is crucial for understanding how family influence affects corporate decisions in this region.

Political connections are also common in emerging markets such as Jordan. Thus, corporate decisions may be influenced by this connection in a positive or negative way. On the one hand, these connections can help companies access resources and overcome some regulatory challenges. On the other hand, they may create pressures that lead to poor investment decisions that deviate from the company's long-term goals. This dual role of political connections triggers an important question regarding how this factor can affect CEO decisions and their investment outcomes. Studying this interaction can provide a clear insight into the unique challenges in Jordan's business environment. Political connections further complicate the relationship between CEO characteristics and investment efficiency. In developing countries such as Jordan, political connections are often leveraged to access valuable resources, reduce financial constraints, and facilitate investment (Altarawneh et al. 2023). While these ties can provide competitive advantages, they may also encourage companies to pursue investments that do not align with long-term objectives, often leading to over-investment and inefficiencies (Ali et al. 2024). Therefore, examining how political connections interact with CEO characteristics is essential for a comprehensive understanding of investment efficiency in the Jordanian context.

Given these complexities and conflicting findings, this study aims to investigate how CEO characteristics impact investment efficiency in Jordanian non-financial companies. To achieve this purpose, the study relies on the UET and Agency Theory to explain how CEO characteristics and political connections interact to affect the level of investment efficiency in emerging countries such as Jordan. Additionally, it seeks to explore the moderating role of political connections in these relationships. By addressing these aspects, the research

provides a more nuanced understanding of how CEO traits and political networks shape investment decisions in an emerging market setting.

The upcoming sections of this study are structured as follows: the literature review delves into prior research on CEO characteristics and their impact on investment efficiency. This section also explores the role of political connections as a moderating influence on investment decisions. The methodology section outlines the research design, data sources, sample selection, and the variables used in the analysis. Following this, the results section presents empirical findings, highlighting the key relationships and interactions observed. The discussion interprets these findings in light of the existing literature, and the conclusion summarizes the study's contributions, practical implications, limitations, and suggestions for future research.

2. Literature Review

This study categorizes CEO characteristics into three main themes. The first discusses the role of CEO age to explore how CEO age can impact investment efficiency. The second section gauges how founder status can impact the company's investment decisions. Finally, we establish the status quo of recent studies about how family ownership can shape investment decisions. This section discusses how political connections can moderate this relationship.

2.1. CEO Age

Previous studies have shown that CEO age can impact investment efficiency in several ways and in several contexts. For example, [Xie \(2015\)](#) studied this issue in SOE Chinese companies and found that CEOs who are younger invest less but with greater efficiency than those who are older. They argue that the political ambitions of young CEOs play a major role in making more scrutinized decisions and resource allocations to enhance their investment outcome. A different but related view was shared by [Gan \(2019\)](#), who also found that CEO age can impact investment decisions. However, the authors argue that older CEOs are more prone to adopting a conservative strategy for investment, which leads to under-investment. In contrast, younger CEOs do not mind taking risks to make an effective investment decision. Both authors argued that younger CEOs are better at resource allocation and long-term company performance.

In recent years, more studies have examined similar issues. In this regard, [Lai et al. \(2020\)](#) studied CEO overconfidence and investment efficiencies at work. They found that the overconfidence of younger CEOs can lead to their applying more aggressive strategies related to labor allocation decisions. On the other hand, older CEOs adopt a more measurable approach to labor allocation. Hence, evidence suggests that overconfidence in younger CEOs can steer to over-investment. Therefore, [Ullah et al. \(2020\)](#) suggested a more balanced approach when dealing with top management. They explore CEO age and age diversity in boards of directors. The study found that age diversity can enhance investment decisions through this pool of ideas. This diversity creates a balance between the tendency of over- and under-investments that is caused by the different views and strategies.

[Chowdhury et al. \(2023\)](#) studied investment efficiencies based on three CEO characteristics, namely, power, age, and tenure. They found that CEOs with longer tenure have more power and are more oriented to over-invest. However, this overconfidence commonly results in a reduction in investment efficiencies. Moreover, this situation usually escalates when CEOs gain more power over time. [Chowdhury et al.'s \(2023\)](#) results contradict those of [Gan \(2019\)](#), arguing that older CEOs are more conservative when it comes to investment efficiencies.

In general, there is a lack of consensus regarding how CEO age can impact investment efficiency. These various results and dynamics suggest an absence of a clear directional relationship. However, it is also possible that cultural, economic, and political connections play a major role in shaping how CEO age merges this relationship.

To address this gap, the following hypothesis is proposed:

H1: *CEO age and founder status do not have a significant impact on investment efficiency for Jordanian non-financial companies listed in the ASE.*

2.2. Founder Status

CEO founder status occurs when a company's CEO is the founder or one of the founders of the company. Typically, the CEO founder status owns a substantial share of the company and is emotionally attached to it. They are also involved in shaping corporate culture and following long-term strategies for the company. Thus, CEO founder status captured research attention and its relation to CEO investment efficiencies. Prior studies have shown that firms that are led by their founder tend to have better performance in terms of environmental, social, and governance (ESG) when compared to other CEOs (Chowdhury et al. 2023). Moreover, CEO founders are more cautious about their investment decisions that reflect their social status. In doing so, companies' reputations and visibility are among their priorities (Meier and Schier 2021). Thus, it is expected that investments are directed toward firms' reputations and toward improving investment efficiencies. This view was shared and noted in various studies that found that CEO founders seek a long-term commitment to the firm and sustainable growth and efficiencies (Wang et al. 2022).

Despite this, other studies have shown that CEO founder status is not always efficient when it comes to CEO investment. For example, Hsu et al. (2020) found that CEO founders with longer tenures invest less in research and development than those with less tenure, causing a reduction in companies' innovations. On the other hand, the tenure of non-founder CEOs showed an inverted U-shaped relationship between investment and research and development. This result indicates that CEO founders change their strategies and behaviors over time.

In addition, Peng et al. (2023) argue that Taiwanese family-owned companies invest more efficiently when managed by their CEO founder or a family descendant. This behavior is well explained by the socioeconomic wealth theory, which assumes that family involvement in the business creates an emotional attachment and leads to long-term planning to pass the company heritage to the next generation. Similar behavior was also observed in Jordan. Bataineh et al. (2018) found that Jordanian family-owned businesses are highly protective of their reputation and tend to avoid earnings management behavior and the use of creative accounting. However, investment decisions have not yet been fully explored in this context.

Abebe et al. (2020) explored the role of CEO founder status in long-term decisions such as merging, acquisition, and development. They found that the existence of the CEO founder significantly impacts these types of decisions. Despite this result, the authors noted that investment decisions were also impacted by other internal and external factors, such as company age and size.

Kongkaew et al. (2022) investigated the impact of CEO founders and investment efficiency in the context of internationalization and IPO underpricing. Their study found that CEO founders are linked to greater IPO underpricing due to the investor's realization that higher risks are connected with their long-term involvement in the firm. This contrasts with the view that founder CEOs enhance investment efficiency, as underpricing reflects a perceived misalignment between the firm's value and its market potential.

To this end, there is a consensus that CEO founder status can play a major role in a company's investment decisions. CEO founders are conscious when making decisions that impact their companies in the long run. This usually leads to efficient investment after considering other external and internal factors. In Jordan, there is a lack of evidence regarding how CEO founders impact investment efficiency. Some factors, such as capital structure, family businesses, culture, and market conditions, could also impact this relationship. Therefore, we build upon prior research to investigate this issue by proposing the following hypothesis:

H2: *CEO founder status does not have a significant impact on investment efficiency for Jordanian non-financial companies listed in the ASE.*

2.3. CEO Family Business

A company is considered family-owned when one or more members of the family control the majority of shares in that company. On most occasions, the board of directors includes family members who are usually positioned at the top level of management. The family is also very active in strategic decisions and has vast control over the company. In addition, an interlink is usually found between ownership and management when the company is acquired by the family for the long term, and this privilege is passed on to the next generations. Much evidence suggests that family-owned businesses behave differently than other forms of business. This includes governance, risk assessment, investment efficiencies, and unique motivations related to their emotional attachment to the company.

Family-owned businesses have been extensively investigated in the prior literature. Family attachment is tackled differently in these studies, as it depends on the cultural construct of the family and whether the community is considered tribal or modernized. This diversity makes it very complex to find a consensus among researchers regarding how family businesses can impact company decisions. However, there is a general belief that the emotional attachment of the family to their company can lead them to make conscious decisions regarding the company's survival.

As for investment efficiency, [Delgado-García et al. \(2023\)](#) focused on two types of CEO effect: positive and negative. They examined the moderating role of family ownership structure on the impact of CEO effect and found that family CEO ownership and ownership within the family branch of the CEO can increase and intensify the effect of the CEO on research and development investment. These results indicate that positive family engagement in the company can result in better investment decisions and innovation within the Spanish context.

Similarly, [García-Sánchez et al. \(2020\)](#) found that the interaction between family businesses and external CEOs can enhance investment decisions. External CEOs can create a balance between the family's tendency toward investment decisions and the CEO being risk-averse, which results in balanced investments that are neither intensified nor exaggerated.

In fact, the family tendency toward investment in research and development has been captured in many contexts. [Zulfiqar et al. \(2021a\)](#) confirmed this by finding that family-owned businesses show overconfidence regarding projects related to innovation. [Wei and Chen \(2022\)](#); [Chen and Huan \(2022\)](#) also confirmed and extended this result by finding that family-owned businesses have more product innovation, while dispersedly owned companies are more innovative in processes and SOPs. This result supports the argument that family-owned businesses direct their investments toward long-term goals and achievements, while dispersedly owned companies tend to focus on short-term goals that reduce costs and maximize short-term benefits.

H3: *Family-based CEO ownership does not have a significant impact on investment efficiency for Jordanian non-financial companies listed in the ASE.*

2.4. Political Connections

Political pressure is another important factor that usually influences market dynamics, especially in developing countries. In recent years, the post-pandemic era has witnessed an increase in developing country debit and exerted intense pressure on their economy. Thus, governments have been subjected to acute economic austerity policies that aim to maintain the status quo of their economy and sustain the currency value. This severe pressure had a profound effect on the economy, leading to several decisions that were not always in the companies' favor. Moreover, high political figures in these countries are usually ideal for

holding positions on the company's board of directors. This exchange usually results in the company gaining a political network that can facilitate their work.

Accordingly, political connections occur when the CEO of the company or members of the board of directors have an established relationship or affiliation with high political figures or governmental institutions. This relationship can facilitate the company's access to information, contracts for government resources, and favorable treatment. Henceforth, this competitive advantage of risk management and reduced uncertainty can create more opportunities for investment efficiency. On the other hand, political connections can have a disastrous effect on the company, as political figures can pressure the company to enter projects that are not fully aligned with the company's vision. Altarawneh et al. (2023) found that companies with political connections are keener to over-invest and have high agency costs that focus on short-term benefits rather than long-term investment. In addition, when family businesses are involved with political connections, they have shown a low level of accounting conservatism and governance (Mohammed et al. 2017). Moreover, Supatmi et al. (2022) strengthened this view, as they found that politically connected and family firms see a decrease in financial position and performance.

Almarayeh et al. (2023) argued that, in Jordan, companies that have high political connections show weak performance caused by inefficiencies and corruption, even with a strong board of directors; this dynamic is very important in Jordan, as a political connection network is spreading around the firms, and companies do rely on this to access resources.

On the other hand, Dewiruna et al. (2020) argued that political connections in Indonesia can positively affect investment decisions in research and development, leading to better performance. Burt and Oppen (2020) found that political connections can positively support entrepreneurship through continuity; however, they found similar results to those of Altarawneh et al. (2023), where older firms with political connections focus on short-term benefits rather than long-term investment.

In general, there is a consensus that political connections can reduce company performance and lead to investment inefficiencies. Companies usually over-invest to gain short-term benefits at the cost of the long run. Accordingly, we further investigate this influence by proposing the following hypothesis:

H4: *Political connections do not have a moderating effect on the relationship between CEO characteristics and investment efficiency in Jordanian non-financial companies listed in the ASE.*

3. Methodology

This study used all Jordanian non-financial firms listed on the Amman Stock Exchange (ASE). The total study sample consisted of 62 firms and covered the period from 2019 to 2023. The years were chosen to capture recent economic conditions impacting Jordanian companies. Thus, this timeframe reflects regulatory shifts, economic challenges, and market volatility due to the COVID-19 pandemic, which created a unique economic environment influencing corporate investment decisions. Firms in the financial sector were omitted from the sample, as their regulatory environment and financial reporting requirements differ substantially from those of non-financial firms. Data were collected from the ASE website and consisted of annual reports and financial statements that were cross-checked for consistency and completeness. The study's variables are listed in Table 1.

Table 1. The study's variables.

Var.	Definition	Data Source
INVEFF	The absolute value of residuals derived from the McNichols and Stubben (2008) model, measuring deviations in investment efficiency.	ASE, Annual Reports
OVER_INV	The value of residuals derived from the McNichols and Stubben (2008) model if the residual is positive (indicating over-investment).	ASE, Annual Reports
UNDER_INV	The value of residuals derived from the McNichols and Stubben (2008) model if the residual is negative (indicating under-investment).	ASE, Annual Reports
CEOAGE	The natural logarithm of CEO age during the year.	Annual Reports
FOUNDER	A dummy variable that takes the value of 1 if the CEO is the company founder and 0 otherwise.	Annual Reports
FAMILYBUS	The percentage of shares owned by family members.	Annual Reports
PCON	A dummy variable that takes the value of 1 if the firm is politically connected and 0 otherwise.	Public information, ASE
SIZE	The natural logarithm of the total assets.	ASE, Annual Reports
ROA	The ratio of net income to the total assets.	ASE, Annual Reports
LEV	The ratio of total debts divided by the total assets.	ASE, Annual Reports
BDSIZE	The total number of directors on the board.	Annual Reports
FIRMAGE	The natural logarithm of the number of years since the firm's incorporation.	ASE, Annual Reports

4. Measurement

The hypotheses about the impact of CEO family ownership and political connections on the efficiency of investment were tested using a method similar to that of [McNichols and Stubben \(2008\)](#). Accordingly, we estimated excess investment as the deviation of the actual investment from the predicted investment based on firm-level characteristics, individually considered for each industry and year to control for industry-specific investment patterns.

Investment efficiency (INVEFF) was measured using the residuals derived from the [McNichols and Stubben \(2008\)](#) model, with the absolute value of residuals transformed into the negative. This unconventional interpretation is adopted because lower values indicate closer alignment between actual and expected investments, suggesting greater efficiency. Positive residuals (OVER_INV) indicate over-investment, while negative residuals (UNDER_INV) indicate under-investment. Moreover, considering the previous literature, two investment efficiency measures (INVEFF1 and INVEFF2) were also used to test the robustness of the results. INVEFF1 and INVEFF2 are different ways of measuring investment efficiency by varying the underlying assumptions or segmenting the data in different ways. Using these two measures ensures that the results are not 'model-dependent' (that is, they are not dependent on the specific ways of defining investment efficiency) and are consistent across different specifications of investment efficiency, thereby increasing confidence that the results are accurate.

$$INV_{i,t} = \alpha_0 + \beta_1 CF_{i,t} + \beta_2 GROWTH_{i,t-1} + \beta_3 INV_{i,t-1} + \epsilon_{i,t}$$

where

- $INV_{i,t}$ represents the investment level for firm i in year t ;
- $CF_{i,t}$ is the firm's cash flow in year t ;
- $GROWTH_{i,t-1}$ is the firm's growth in total assets from year $t-2$ to year $t-1$;
- $INV_{i,t-1}$ is the firm's lagged investment from the prior year.

Investment efficiency is the absolute value of the residuals transformed into the negative. Higher negative values are indicative of greater efficiency. Over-investment is measured when the residuals are positive, and under-investment is measured when

the residuals are negative. This strategy allows us to capture both the over- and under-investment behaviors of firms in Jordan and to see how CEO characteristics, family ownership, and political connections affect them. In addition to the core regression models, there are interaction terms for the moderating effects of political connections. Based on the unique characteristics of Jordanian firms, some of them had to be entered as interaction terms with other variables in the regression models.

5. Regression Model

For the hypotheses related to CEO age, CEO founder status, family-based CEO ownership, and political connections, we used a cluster regression, with fixed effects of year and industry, to test whether being a Jordanian non-financial firm has any effect on these variables. To account for potential endogeneity and autocorrelation within firms, the analysis employed a clustering method at the firm level. This approach groups standard errors by firm to mitigate within-firm correlations over time, thus providing more robust results. By clustering standard errors, the study reduces bias from unobserved, firm-specific effects that may influence investment efficiency. Accordingly, we used descriptive statistics to present the findings and conducted pair-wise correlations and univariate differences (between the samples) to check for the normality of the distribution and homoscedasticity; we tested the regression using the *t*-test. Additionally, we utilized the Heckman test to check the robustness of the model and account for the possibility of sample selection bias. To ensure the robustness of the regression model, we conducted a multi-collinearity test using the VIF for all independent variables; the results indicated no severe multi-collinearity issues. Heteroskedasticity was also tested using the Breusch–Pagan test, and any detected heteroskedasticity was addressed by applying robust standard errors to improve the reliability of coefficient estimates. Additionally, autocorrelation was checked using the Durbin–Watson test, and adjustments were made as necessary to account for serial correlation within the panel data. Afterward, we confirmed that the regression model is appropriately specified and satisfies key statistical assumptions, supporting the validity of the results.

The basic specifications for testing the hypotheses were as follows:

$$\text{INVEFF}_{it} = \alpha_0 + \beta_1 \text{CEOAGE}_{it} + \beta_2 \text{FOUNDER}_{it} + \beta_3 \text{FAMILYCEO}_{it} + \beta_4 \text{PCON}_{it} + \beta_5 \text{SIZE}_{it} + \beta_6 \text{ROA}_{it} + \beta_7 \text{LEV}_{it} + \beta_8 \text{BDSIZE}_{it} + \beta_9 \text{FIRMAGE}_{it} + \theta_1 - \text{nFixed_effect}_{it} + \text{eit}$$

where

- INVEFF is the investment efficiency;
- CEOAGE is the natural logarithm of CEO age;
- FOUNDER is a binary variable that takes the value of 1 if the CEO is the founder of the firm or 0 otherwise;
- FAMILYCEO is a binary variable for family CEO status (1 if the CEO is a family member or 0 otherwise);
- PCON is a binary variable representing political connections (1 if the firm has political ties or 0 otherwise);
- SIZE is the natural logarithm of the total assets;
- ROA is the return on the assets (net income/total assets);
- LEV is the leverage ratio (total debts/total assets);
- BDSIZE is the number of directors on the board;
- FIRMAGE is the natural logarithm of the number of years since the firm's incorporation;
- Fixed_effects include year- and industry-fixed effects;
- eit is the error term.

As was the case for [Bae et al. \(2017\)](#), [Biddle et al. \(2009\)](#), and [Cheng et al. \(2013\)](#), we also controlled for firm-level factors that might affect investment efficiency, such as firm size, return on assets, leverage, board size, and firm age.

6. Empirical Results

Table 2 presents the descriptive statistics for the variables used in the study. The table depicts the measures of CEO characteristics, investment efficiency, and other control variables across Jordanian firms.

Table 2. Descriptive statistics.

Variable	Mean	Std. Dev.	Min	Max
OVER_INV1	0.021	0.036	0.000	0.420
UNDER_INV1	−0.036	0.021	−0.063	0.000
INVEFF	−0.035	0.022	−0.210	0.000
CEOAGE	55.71	5.99	40.2	68.7
FOUNDER	0.181	0.385	0	1
FAMILYCEO	0.198	0.105	0	1
PCON	0.4814	0.4995	0	1
SIZE	7.238	0.633	6.88	7.591
ROA	0.032	0.116	−0.2	0.0205
LEV	36.469	28.524	1.891	50.589
BDSIZE	7.728	2.26	6	9
FIRIMAGE	26.786	15.787	6	62

Table 2 shows the descriptive statistics for the variables used in the model and provides a summary of the characteristics of the sample firms. The variable denoting the overall level of over-investment (OVER_INV1) has a mean of 0.021 and a standard deviation of 0.036, reflecting moderate variability in the level of over-investment across firms (with a minimum of 0.000 and maximum of 0.420). The variable denoting the overall level of under-investment (UNDER_INV1) has a mean of −0.036, reflecting the fact that some firms tend to under-invest (with a minimum and maximum of −0.063 and 0.000, respectively). The overall measure of investment efficiency (INVEFF) has a mean of −0.035, implying that firms tend to have negative residuals (with a standard deviation of 0.022, reflecting variability between actual and expected levels of investment).

The average CEO age (CEOAGE) is 55.71 years, with a range of 40.2 to 68.7 years, which indicates that most of the CEOs, on average, are in the late part of their career. The variable CEO founder status (FOUNDER) indicates that 18.1% of the CEOs are the founders of a firm, and 19.8% are members of a family (FAMILYCEO), which is not surprising given the nature of family firms. Political connections are not uncommon, as 48.14% of firms have political connections, suggesting that political factors could play an important role in the sample.

7. Regression Results

Table 3 presents the results of the cluster regression analysis, which examines the impact of CEO characteristics, firm attributes, and political connections on investment efficiency. The analysis focuses on over-investment (OVER_INV1) and under-investment (UNDER_INV1) decisions to determine how factors such as CEO age, founder status, family CEO status, and political connections influence firms' tendencies to deviate from optimal investment levels.

The results of the regression for over-investment (OVER_INV1) and under-investment (UNDER_INV1) indicate how firm-specific, CEO characteristics, and political connections affect the efficiency of investment. In the over-investment model, the coefficient for CEOAGE is negative and significant (−0.034, $p < 0.01$), meaning that older CEOs are less likely to engage in over-investment. In other words, the predicted effect of age (experience)

and probably the risk aversion associated with it (‘experience curse’) can lead to wiser investment decisions. Similarly, in the under-investment model, CEOAGE is negative and significant (-0.028 , $p < 0.01$), implying that older CEOs are also less likely to engage in under-investment, likely because of experience and, hence, better resource allocation.

Table 3. Cluster regression results.

DV	OVER_INV1	UNDER_INV1
Intercept	0.062 ** (2.560)	−0.135 *** (−7.789)
CEOAGE	−0.034 *** (−3.210)	−0.028 *** (−4.902)
FOUNDER	0.002 (0.678)	−0.007 (−0.642)
FAMILYCEO	0.003 (0.932)	0.010 ** (2.290)
PCON	0.027 *** (3.901)	−0.012 *** (−2.673)
SIZE	0.003 ** (2.411)	0.007 *** (3.874)
ROA	0.038 *** (5.012)	0.064 *** (6.513)
LEV	0.022 *** (4.110)	0.014 *** (3.271)
BDSIZE	−0.001 (−0.789)	−0.003 (−0.901)
FIRMAGE	−0.004 (−1.321)	−0.009 * (−1.841)
Fixed Effects	Included	Included
Adj. R ²	0.41	0.38
N	1240	1240
F-stat	6.154	28.942

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

FOUNDER is positive and significant in the under-investment model (0.014 , $p < 0.01$) and is not significant in the investment efficiency model, which is surprising, as it suggests that being a founder does not have an inherent impact on investment efficiency. However, FAMILYCEO is positive and significant in the under-investment model (0.010 , $p < 0.05$) and, again, insignificant in the investment efficiency model, which suggests that firms run by family-member CEOs are more likely to under-invest. It is plausible that this reflects a conservative approach to investment, with family members prioritizing the preservation of family wealth over aggressive expansion.

Political connections (PCON) are included in both models. The coefficient for PCON is positive and significant at the 1% level in the over-investment model (coefficient of 0.027), meaning that political connections increase the likelihood of over-investment, whether via easier access to financing or because these firms are simply granted investment permissions in excess of optimal levels. In the under-investment model, PCON is negative and significant at the 1% level (-0.012), suggesting that political connections help to reduce under-investment, perhaps by removing financial constraints.

The control variables (SIZE, ROA, and LEV) are statistically significant in both models. The positive coefficients for SIZE and ROA reveal that larger and more profitable firms are more likely to both over- and under-invest, which is consistent with the more complicated investment behaviors of large and successful firms. The positive relationship with LEV indicates that debt levels and investment inefficiency are interconnected, with higher levels of leverage being positively associated with inefficient investment, perhaps as a result of the pressure of debt servicing.

The adjusted R-squared values for the over-investment and under-investment models are 0.41 and 0.38 , respectively, and so the models account for most of the variability in investment inefficiency. The F-statistics are highly significant and support the validity of the regressions.

These findings underline the important role of CEO age and political ties in investment decisions. The positive effect of political ties on over-investment and the negative effect on under-investment shows the ambiguous role of political ties in corporate governance and allocation of resources. To look more in-depth into these dynamics, the next level of analysis introduces the moderating role of political connections. This will help us to understand how political ties affect the relationship between CEO traits, family ownership, and investment efficiency.

Regarding firm characteristics, the average firm size (SIZE; logarithm of total assets) is 7.238, with a small standard deviation, which indicates that the sample firms are quite similar in size. Return on assets (ROA) has a mean of 0.032, but its large standard deviation (0.116) indicates substantial differences across firms regarding profitability. Leverage (LEV) has an average of 36.47%, which is quite high and indicates that many firms depend on debt to finance activities. The board size (BDSIZE) has an average of 7.73 members, and the average firm age (FIRMAGE) is 26.78 years, which indicates that we are dealing with mature firms with well-established governance mechanisms in place.

8. Moderating Effect

The results of the regression shown in the Table 4 below reveal that there are several significant relationships between CEO characteristics, family ownership, and investment efficiency, with political connections as a moderating factor. As with the previous results, CEO age (CEOAGE) remains a significant determinant of investment efficiency, positively affecting overall efficiency (INVEFF) and reducing both over- and under-investment inefficiencies. The negative coefficients of over- and under-investment suggest that older CEOs are more risk-averse and better attuned to long-term firm value.

Table 4. Regression estimates regarding the effect of CEO characteristics, family ownership, and politically connected firms on investment efficiency.

DV	INVEFF	OVER_INV1	UNDER_INV1
Intercept	−0.215 *** (−8.712)	0.091 *** (3.254)	−0.129 *** (−6.841)
CEOAGE	0.028 ** (2.512)	−0.041 ** (−3.220)	−0.019 *** (−5.361)
PCON	0.020 * (1.764)	−0.052 ** (−2.654)	−0.037 *** (−4.452)
PCON*AGE	−0.014 *** (−3.721)	0.014 ** (2.427)	−0.010 ** (−2.314)
FOUNDER	0.002 (1.014)	0.002 (0.644)	−0.003 (−0.698)
FAMILYCEO	0.008 * (1.943)	0.010 ** (2.213)	0.008 ** (2.571)
PCON*FOUNDER	−0.017 ** (−3.601)	0.013 ** (2.431)	−0.009 *** (−3.114)
PCON*FAMILYCEO	−0.013 *** (−3.762)	0.011 ** (2.601)	−0.010 *** (−3.321)
SIZE	0.002 ** (2.311)	0.004 *** (3.732)	0.005 ** (2.731)
ROA	0.036 *** (5.312)	0.046 *** (5.812)	0.068 *** (6.911)

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Political connections (PCON), which are weakly positive in the main investment efficiency model, are very strongly negative with both over-investment (OVER_INV1) and under-investment (UNDER_INV1). This suggests that politically connected firms make poorer investment decisions. This is in line with our expectations that political ties result in poorer investment outcomes through inefficiencies due to political rent-seeking.

The interaction terms tell a more interesting story. PCON*AGE has a negative effect on aggregate investment efficiency and under-investment but a positive relationship with over-investment. Political connections mitigate the positive effect of older CEOs on efficiency, especially by reducing the effect of their risk aversion and leading them to pursue riskier over-investment strategies.

Consistent with this interpretation, the interaction terms PCON*FOUNDER and PCON*FAMILYCEO also indicate under-investment and negative impacts on investment efficiency while increasing over-investment. The results suggest that politically connected family firms and founder-led companies are more inclined to over-invest, thereby diminishing the otherwise beneficial role of family ownership in the efficient allocation of resources.

Control variables continue to play a role via SIZE, ROA, and LEV across the models, which serves to highlight the importance of firm size, profitability, and leveraging in shaping investment efficiency. Larger firms have better resource access and show a natural resilience against under-investment, while firms with high ROA demonstrate effective operational efficiency, supporting optimal investment levels. Leverage can also restrict or pressure firms into efficient investment choices due to debt obligations and can influence investment efficiency outcomes. We also note that political connections become a moderating variable that unveils how external political forces interact with internal leadership attributes to shape investment efficiency in Jordanian firms. The results here show that political connections introduce more complexity into investment decisions, including through shaping over-investment behaviors that could diminish overall efficiency.

9. Discussion and Conclusions

This study aimed to explore the impact of CEO characteristics on investment efficiency for Jordanian companies. Furthermore, the study also explored political connections as a moderator for this relationship.

To achieve this purpose, we ran several regression models to explore these relationships covering the period from 2016 to 2023 in Jordanian ASE companies. The first two models explored CEO investment decisions and whether they tend to under- or over-invest. We found that older CEOs maintain an even-handed approach regarding investment decisions, as they are less likely to engage in over-investment decisions and also mitigate under-investment. This can be explained by the assumption that older CEOs are more experienced and follow risk-averse strategies. Likewise, we believe that older CEOs are better at resource allocation skills, which is considered to have a beneficial influence on the companies in the long run. Accordingly, the findings indicate that older CEOs, with their conservative and balanced resource allocation approaches, positively impact long-term investment efficiency. This suggests that firms seeking sustainable growth may benefit from experienced leadership that emphasizes careful investment strategies. On the other hand, family CEOs prioritize wealth preservation, indicating that family-owned firms might adopt more risk-averse policies that could limit aggressive expansion. Contrastingly, younger CEOs tend to pursue aggressive and innovative investment strategies. Similar results were captured by Xie (2015) and Gan (2019), who found that younger leaders often drive higher efficiency in emerging markets. However, Chowdhury et al. (2023) argued that there are risks of overconfidence among younger CEOs, leading to over-investment.

In contrast to our expectations, CEO founder status does not have any effect on investment efficiency or decisions regarding over- or under-investment. This result shows that founders do not have a substantial influence over companies' decisions regarding investment. We also found that family member CEOs are engaged in under-investment decisions. The results support the view that family member CEOs are keener to preserve their wealth rather than following aggressive expansion. Finally, our results confirm the prior finding that political connections can impose pressure on companies to over-invest beyond their optimal level. In addition, we found that political connection reduces under-investment by elevating financial constraints.

The second main result of this research confirmed that political connections moderate the relationship between CEO characteristics and investment efficiency. CEO age, founder status, and family member CEO status are all negatively affected by political connections through decisions that encourage riskier and over-investment strategies. Moreover, we found that political connections can dilute the positive effect that resulted from CEO age and family member CEO status. Political connections exhibit a dual influence by moderating

the effects of CEO characteristics on investment efficiency. While they mitigate under-investment by easing financial constraints, they also heighten over-investment tendencies, particularly when interacting with CEO characteristics such as age and family member status. This dual effect complicates decision-making, where political ties might dilute the benefits of experienced or family member CEOs by encouraging high-risk, sub-optimal investments that align more with political objectives than with firm growth.

The first key result of this study supports the hypothesis that younger CEOs improve the efficiency of investment in Jordanian companies, which is consistent with Xie's (2015) and Gan's (2019) empirical findings that younger CEOs tend to make more aggressive and efficient investments in developing and emerging markets. However, it is opposite to the findings of Chowdhury et al. (2023), where younger CEOs are more overconfident and may over-invest. The adaptability and innovative thinking of younger CEOs in Jordan seem to outweigh the risk of overconfidence, which has a positive effect on improving investment efficiency in Jordan's specific socioeconomic environment.

In addition, the effect of CEO founder status on investment efficiency is expected to enhance investment efficiency through long-term commitment and strategic alignment (Guenzel and Malmendier 2020; Peng et al. 2023). However, our results did not support this view in Jordan.

Moreover, our result is in line with those found by Delgado-García et al. (2023) and Zulfiqar et al. (2021b), who stated that family businesses usually have a greater tendency to protect family wealth, rather than going for aggressive and risky investment strategies. The conservative investment policy can protect the family interests, but it can also undermine the firm's ability to take advantage of the growth opportunities and, hence, reduce the investment efficiency of the firm.

Lastly, the study's exploration of political connections as a moderating factor reveals that political ties exert a double impact on investment efficiency. As discussed earlier, political connections can facilitate and hinder investment decisions. The results here show that while political connections mitigate under-investment by providing firms with easier access to capital, they also increase the likelihood of over-investment. This is in line with what Altarawneh et al. (2023) observed, which is that political connections tend to result in over-investment in sub-optimal projects. Moreover, the interaction of political connections with family ownership and founder status further exacerbates over-investment tendencies and undermines the positive effects of these leadership and ownership arrangements. Together, these findings indicate that political connections render investment decisions inefficient in Jordan by encouraging politically motivated investment projects that are riskier and less likely to yield good returns. This double effect complicates the governance and resourcing processes in Jordanian firms, indicating that political ties are short-term facilitators that lead to long-term inefficiencies.

As in all research, this study is subject to several limitations. The first is that the focus was only on non-financial firms listed on the Amman Stock Exchange (ASE). Thus, the results lack external validity for other segments of the market, such as SMEs or unlisted family firms. Secondly, the 5-year period (2019–2023) is also insufficient to capture longer-term investment efficiency trends in industries with longer capital cycles or when subjected to important regulatory changes. Moreover, the timeframe of this study includes the global COVID-19 pandemic, which may influence corporate investment behaviors. Hence, the results should be interpreted carefully, as they may not fully represent periods unaffected by pandemic-related economic disruptions. Thirdly, we relied on a binary variable to capture the presence of political connections, which might underestimate the subtle and nuanced role that these ties play in corporate governance and investment decisions. Finally, the regression models used in this study do not provide sufficient evidence of causation. Hence, the results should be interpreted carefully before any generalizability attempt.

Despite these limitations, the study reveals several results that provide insights into Jordanian firms and policymakers regarding the role of CEO characteristics on investment decisions and relevant considerations to improve governance or leadership selection.

Theoretically, this study enhances the UET and agency theory by explaining how CEO characteristics and political connections interact to affect the level of investment efficiency in emerging countries such as Jordan. Moreover, the study also broadens the existing literature on the corporate governance of political connections by determining the effects of these factors on firm resource allocation in developing economies.

Future research can strengthen the generalizability of these results by expanding the scope of the analysis to include other sectors, especially SMEs. In addition, future studies could examine the impact of CEO age, founder status, and political connections by using more refined measures for political connections (for example, the strength or type of political ties). Moreover, researchers can explore the extent to which external governance mechanisms, such as independent directors or regulatory reforms, can mitigate the adverse effects of political connections and family ownership on investment decisions. Finally, studies that recognize other factors, such as organizational culture, management practices, and external economic shocks, could also relate this to investment efficiency. The current study did not include those factors in the model despite their potential influence on corporate decision-making. Hence, future studies can improve the current model by introducing these factors.

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