

“Does board gender diversity moderate the nexus among family ownership, ESG, and investment efficiency in the MENA region?”

AUTHORS	Isam Saleh  Arwa H. Amoush  Abdallah AlKhawaja 
ARTICLE INFO	Isam Saleh, Arwa H. Amoush and Abdallah AlKhawaja (2026). Does board gender diversity moderate the nexus among family ownership, ESG, and investment efficiency in the MENA region?. <i>Investment Management and Financial Innovations</i> , 23(3), 357–369. doi: 10.21511/imfi.23(3).2026.25
DOI	http://dx.doi.org/10.21511/imfi.23(3).2026.25
RELEASED ON	Tuesday, 25 August 2026
RECEIVED ON	Tuesday, 06 January 2026
ACCEPTED ON	Tuesday, 21 July 2026
LICENSE	 This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Investment Management and Financial Innovations"
ISSN PRINT	1810-4967
ISSN ONLINE	1812-9358
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”

		
NUMBER OF REFERENCES	NUMBER OF FIGURES	NUMBER OF TABLES
54	0	6

© The author(s) 2026. This publication is an open access article.



BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Type of the article: Research Article

Received on: 6th of January, 2026

Accepted on: 21st of July, 2026

Published on: 25th of August, 2026

© Isam Saleh, Arwa H. Amoush,
Abdallah Alkhawaja, 2026

Isam Saleh, Associate Professor,
Department of Accounting, Faculty of
Business, Al-Zaytoonah University of
Jordan, Jordan. (Corresponding author)

Arwa H. Amoush, Assistant Professor,
Department of Accounting, Faculty of
Business, Al-Zaytoonah University of
Jordan, Jordan.

Abdallah Alkhawaja, Assistant
Professor, Department of Accounting,
College of Business, American
University of the Middle East, Kuwait.



This is an Open Access article,
distributed under the terms of the
[Creative Commons Attribution 4.0
International license](https://creativecommons.org/licenses/by/4.0/), which permits
unrestricted re-use, distribution, and
reproduction in any medium, provided
the original work is properly cited.

Conflict of interest statement:

Author(s) reported no conflict of interest

Isam Saleh (Jordan), Arwa H. Amoush (Jordan), Abdallah Alkhawaja (Kuwait)

DOES BOARD GENDER DIVERSITY MODERATE THE NEXUS AMONG FAMILY OWNERSHIP, ESG, AND INVESTMENT EFFICIENCY IN THE MENA REGION?

Abstract

This study examines the relationship between family ownership and investment efficiency in the Middle East and North Africa (MENA) region by investigating the mediating role of environmental, social, and governance (ESG) performance and the moderating role of board gender diversity. Using a sample of non-financial firms from eight MENA countries (Saudi Arabia, Egypt, Jordan, Kuwait, United Arab Emirates, Qatar, Oman, and Bahrain) over the period 2015–2023, comprising 3,245 firm-year observations, and ESG data obtained from Refinitiv, the analysis employs firm fixed-effects and system GMM estimations. The results indicate that family ownership is positively associated with investment efficiency ($\beta = 0.044$, $p < 0.01$). Family ownership also has a positive effect on ESG performance ($\beta = 0.118$, $p < 0.01$), while ESG performance is positively associated with investment efficiency ($\beta = 0.039$, $p < 0.01$). Further analysis reveals that ESG performance partially mediates the relationship between family ownership and investment efficiency. Moreover, board gender diversity strengthens the positive effect of ESG performance on investment efficiency ($\beta = 0.001$, $p < 0.01$), indicating that firms with greater female board representation are better able to translate sustainability engagement into efficient capital allocation. The findings highlight the complementary roles of family ownership, ESG performance, and board gender diversity in enhancing investment efficiency in emerging markets. These results provide important implications for policymakers, investors, and corporate leaders seeking to promote sustainable governance and efficient investment decisions in the MENA region.

Keywords

sustainability, governance, performance, diversity,
emerging market, institutions

JEL Classification

G30, G34, Q56, M14

INTRODUCTION

Making smart investment choices is crucial for creating value in a company and fostering sustainable economic growth. These decisions help firms pick projects that boost value while steering clear of both overinvestment and underinvestment (Biddle et al., 2009; Jensen, 1986). When capital is not allocated efficiently, it often points to weak governance, conflicts of interest, and gaps in information, which can ultimately diminish a firm's value. This issue is especially evident in developing markets, where poor institutional frameworks, concentrated ownership, and limited protections for investors make capital allocation even trickier.

The focus on the Middle East and North Africa (MENA) region is particularly significant due to its unique governance and institutional features (Afifa et al., 2021). Companies in MENA countries usually operate in environments marked by concentrated ownership, limited

investor protection, and less developed external governance mechanisms (Saleh et al., 2023; Otero et al., 2020). In these contexts, internal governance elements, such as family ownership and ESG engagement, are crucial in shaping corporate actions and investment decisions (Zhu et al., 2025). Moreover, the level of gender diversity on boards is still quite low across many MENA countries, making it an important yet under-researched area of governance (Rabbani et al., 2024). These institutional characteristics together create a compelling context for investigating how governance structures affect investment efficiency.

Against this backdrop, the present study addresses the following research question: how does family ownership influence firms' investment efficiency in the MENA region, and what roles do ESG performance and board gender diversity play in this relationship?

1. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This section reviews the literature on family ownership and its connection to investment efficiency. We then review extant literature on family ownership and ESG Performance, as well as ESG performance and investment efficiency. Finally, the section discusses the role of board gender diversity and develops the study hypotheses.

Agency theory posits that separation between ownership and control gives rise to conflicts of interest that may lead managers or controlling shareholders to pursue private benefits at the expense of efficient investment decisions (Jensen & Meckling, 1976). In firms with concentrated ownership, particularly family-controlled firms, monitoring incentives may be stronger due to large cash-flow rights, potentially reducing managerial opportunism and improving investment efficiency. However, concentrated ownership may also facilitate entrenchment and expropriation of minority shareholders, resulting in inefficient overinvestment or underinvestment decisions (Wu et al., 2025; Moradi et al., 2022; Demsetz & Villalonga, 2001).

Empirical evidence from emerging markets supports this dual view. Recent studies document that family ownership can significantly shape firms' investment behavior, with its effect on investment efficiency depending on the effectiveness of internal governance mechanisms (Eissa et al., 2025; Al-Hadi et al., 2022). In weak institutional environments such as the MENA region, where external monitoring is limited, fam-

ily ownership plays a particularly critical role in influencing investment outcomes (Fiorillo & Santilli, 2024). Accordingly, we expect family ownership to be systematically associated with firms' investment efficiency.

Stakeholder theory shows that businesses implement ESG practices because they need to fulfill various stakeholder expectations, which helps them maintain legitimacy and achieve enduring business success (Freeman, 1984; Afifa et al., 2021; Nam et al., 2024). The family ownership of a company determines how well it will answer stakeholder demands because owners who control the company decide which business goals to pursue and what information to disclose to the public. Family owners tend to back ESG engagement because it helps them defend their company's reputation and maintain their social assets and long-term business value in situations where corporate reputation stands as a vital asset (Dogan Basar et al., 2025; Doshi et al., 2024).

Research findings from MENA countries and other developing markets demonstrate that ownership patterns directly influence both ESG disclosure practices and environmental, social, and governance performance. Empirical research demonstrates that family ownership controls both ESG performance and disclosure quality, while governance systems determine how these factors interact (Giordino et al., 2025; Al Amosh & Khatib, 2022). The research indicates that ESG engagement emerges as a strategic result that depends on the specific characteristics of ownership. The research suggests that family ownership patterns affect how well companies perform regarding their Environmental, Social, and Governance (ESG) responsibilities.

The agency-theoretic model shows that ESG performance creates better transparency, which decreases the difference between what insiders know and what outsiders know, thus limiting their ability to act against shareholders and making investments more efficient. ESG engagement at its strongest level functions as an organizational system that controls executive choices while making investment decisions that support enduring business worth (Tang et al., 2025; Benlemlih & Bitar, 2018).

Research findings validate this argument. Empirical evidence shows that ESG performance leads to better investment results when markets experience excessive investment activity (Bilyay-Erdogan et al., 2024; Lee et al., 2024). The research shows that ESG practices create actual investment results instead of functioning as empty corporate gestures. The research predicts that ESG performance will create a positive connection with investment efficiency.

Integrating agency and stakeholder perspectives, ESG performance can be viewed as a mechanism through which family ownership influences investment efficiency. Family ownership shapes firms' incentives to engage in ESG practices, while ESG engagement, in turn, enhances monitoring quality and transparency, thereby improving capital allocation efficiency (Nasta et al., 2024; Zhang, 2024).

Previous studies have shown evidence that supports this proposed mechanism. Research indicates that family ownership determines ESG performance (Al Amosh & Khatib, 2022) while ESG performance enhances investment efficiency (Al-Hiyari et al., 2023). The current body of research lacks evidence that demonstrates ESG performance acts as a connecting factor between family ownership and investment efficiency within the MENA region. The research design follows from this reasoning, as ESG performance serves as the mechanism that connects family ownership to investment efficiency.

The board composition affects firms' resource access and their ability to monitor operations and make strategic decisions according to resource dependence theory and agency theory. The presence of women on boards creates better cognitive

diversity, which leads to enhanced ethical sensitivity and improved stakeholder relations, resulting in stronger board performance for monitoring and advisory functions (Ma et al., 2024; Saleh et al., 2022; Hillman et al., 2009).

Research findings show that companies with gender-diverse boards achieve better ESG results, develop environmental innovations, and show stronger sustainability involvement (Atif et al., 2021; Omenihu et al., 2025). Research indicates that board diversity functions as a limiting factor that determines how ESG mechanisms create actual economic results. The research by Al-Hiyari et al. (2023) demonstrates that board diversity acts as a moderating factor that affects how ESG factors influence investment efficiency in emerging market economies.

The MENA region requires boards to have more female members because this change will enhance their ability to perform ESG engagement duties by making their ESG practices more than tokenistic and by creating investment decisions that follow ESG strategies. The research investigates how board gender diversity affects the connection between ESG performance and investment efficiency.

Therefore, the literature to this effect points out that family ownership and sustainability-oriented governance mechanisms play a significant role in shaping investment efficiency by firms, particularly when institutional environments are relatively weak and family ownership is highly concentrated. Past research also indicates that board-level oversight is necessary to ensure sustainability practices yield substantive economic outcomes. However, the interactive role of family ownership, ESG performance, and board gender diversity in influencing investment efficiency remains underexplored to date, especially in the MENA region.

Collectively, this study aims to examine how family ownership influences investment efficiency through ESG performance and whether board gender diversity strengthens the relationship between ESG performance and investment efficiency. Accordingly, the study investigates mediation and moderation as complementary governance mechanisms within the corporate governance framework. The following hypotheses are proposed:

- H1: Family ownership significantly affects firms' investment efficiency.*
- H2: Family ownership is significantly associated with firms' ESG performance.*
- H3: ESG performance is positively associated with firms' investment efficiency.*
- H4: ESG performance mediates the relationship between family ownership and investment efficiency.*
- H5: Board gender diversity positively moderates the relationship between ESG and investment efficiency.*

2. METHODOLOGY

2.1. Sample

The research uses non-financial companies from eight MENA nations that have ESG performance information available through Refinitiv (ASSET4). The final sample generates a total of 3,245 firm-year observations over the period 2015–2023. The sample includes firms from Saudi Arabia, Egypt, Jordan, Kuwait, United Arab Emirates, Qatar, Oman, and Bahrain. The cross-country setting provides substantial variation in governance practices, ESG engagement, and institutional environments, making the MENA region an appropriate setting for examining the interaction among family ownership, ESG performance, and investment efficiency. Given the institutional and regulatory differences across MENA countries, the empirical models include firm and year fixed effects to mitigate the influence of unobserved heterogeneity across firms and time.

The analysis excludes financial institutions because their regulatory environment, funding patterns, and investment patterns differ from other companies, which could affect the assessment of investment performance. The final dataset consists of an unbalanced panel that contains firm-year observations that researchers use in investment efficiency and corporate governance studies to achieve data maximization while maintaining cross-firm and cross-country analysis capabilities (Abdullah, 2025; Atif et al., 2021).

2.2. Variable measurements

The investment efficiency measurement process uses the residual-based method which investment efficiency researchers (Richardson, 2006; Biddle et al., 2009). The study uses growth opportunities and firm characteristics to predict firm-level investment before calculating investment inefficiency through absolute residual values from this model. The study uses absolute residual values from this model to measure investment inefficiency because higher values show greater distance from optimal investment. The research method has become widely used throughout emerging market economies in ESG-investment efficiency studies (Mnasri et al., 2025; Aladwey & Alsudays, 2023). The analysis uses residual values, which receive a negative multiplication factor to achieve better interpretation because these values now indicate higher investment efficiency according to previous studies.

The family ownership data includes family ownership, which represents the percentage of shares that family members and their related entities maintain. Family ownership stands as the leading ownership structure throughout MENA countries, which research shows controls how businesses organize their governance systems and handle environmental, social, and governance matters and investment decisions (Eissa et al., 2025; Al Amosh & Khatib, 2022). The measurement indicates how much control family shareholders maintain while showing their ability to shape business strategy and investment choices.

The composite ESG score from Refinitiv (ASSET4) serves as the metric to evaluate ESG performance. The composite score combines environmental, social, and governance performance data from standardized indicators that use public information sources. The research uses this measurement method throughout accounting and finance studies, which makes it an ideal choice for emerging market ESG cross-country analysis because it provides both consistency and comparable results (Alkhawaja et al., 2023).

According to research on governance and sustainability (Atif et al., 2021; Ali Gull et al., 2023), the percentage of women holding board positions is

used to assess gender diversity on boards. The research used a continuous measurement system to track female board member distribution because it enables researchers to study both the range of female board member presence and its relationship with ESG performance metrics.

Consistent with prior investment efficiency research, the models include control variables such as firm size (natural logarithm of total assets), leverage (total debt to total assets), profitability (return on assets), cash holdings, and Tobin's Q, which captures firms' growth opportunities and investment demand (Toumeh, 2025; Aroul et al., 2022) (see Table A1, Appendix A, for full Variable definitions).

2.3. Model specifications

To examine the proposed relationships, the study separately tests the mediating role of ESG performance and the moderating role of board gender diversity. The mediating role of ESG performance is examined using the causal-step approach, whereas the moderating role of board gender diversity is assessed by including the interaction term between ESG performance and board gender diversity in the regression models. Accordingly, the study does not estimate a formal moderated mediation model.

To test the study's hypotheses, the following panel regression models are estimated.

$$IE_{it} = \alpha + \beta 1 OWN_{it} + \beta 2 Controls_{it} + \beta 3 FIRM_{it} + \beta 4 YEAR_{it} + \varepsilon_{it}, \quad (1)$$

$$ESG_{it} = \alpha + \beta 1 OWN_{it} + \beta 2 Controls_{it} + \beta 3 FIRM_{it} + \beta 4 YEAR_{it} + \varepsilon_{it}, \quad (2)$$

$$IE_{it} = \alpha + \beta 1 ESG_{it} + \beta 2 Controls_{it} + \beta 3 FIRM_{it} + \beta 4 YEAR_{it} + \varepsilon_{it}, \quad (3)$$

$$IE_{it} = \alpha + \beta 1 OWN_{it} + \beta 2 ESG_{it} + \beta 3 Controls_{it} + \beta 4 FIRM_{it} + \beta 5 YEAR_{it} + \varepsilon_{it}, \quad (4)$$

$$IE_{it} = \alpha + \beta 1 ESG_{it} + \beta 2 BGD_{it} + \beta 3 ESG_{it} \cdot BGD_{it} + \beta 4 Controls_{it} + \beta 5 FIRM_{it} + \beta 6 YEAR_{it} + \varepsilon_{it}, \quad (5)$$

where the first equation denotes hypothesis *H1*, the second equation denotes hypothesis *H2*, the third equation denotes hypothesis *H3*, the fourth equation denotes hypothesis *H4*, and the fifth equation denotes hypothesis *H5*.

In these equations, IE represents investment efficiency; OWN represents family ownership; ESG represents environmental, social, and governance performance; BGD represents board gender diversity; $ESG \times BGD$ represents the interaction between ESG performance and board gender diversity; SIZE represents firm size; LEV represents leverage; ROA represents return on assets; CASH represents cash holdings; and Tobin's Q represents firms' growth opportunities. Firm and year fixed effects are included in the models to control for unobserved firm-specific heterogeneity and time-specific effects, respectively.

3. RESULTS

3.1. Descriptive analysis

Table 1. Descriptive statistics

Variable	Mean	Std. Dev.	Min	Max
IE	-0.083	0.051	-0.250	0.040
OWN	27.460	18.320	0.000	79.900
ESG	42.780	16.540	9.200	86.400
BGD	6.840	5.920	0.000	28.600
SIZE	15.210	1.470	11.920	19.080
LEV	0.412	0.221	0.020	0.890
ROA	0.041	0.078	-0.210	0.240
CASH	0.096	0.089	0.002	0.410
Tobin's Q	1.210	0.640	0.410	3.480

The main variables used in the analysis receive their descriptive statistics in Table 1. The mean value of investment efficiency (IE) shows that non-financial firms in the MENA region have moderate differences in their capital allocation efficiency, leading to both excessive investment and insufficient investment. The average family ownership in the sample reaches 27.5%, which demonstrates that family-controlled businesses maintain their leading position, while ownership percentages between firms show wide variations. The average ESG score reaches 42.8, which indicates companies have achieved a middle level of sustainability performance; yet the scores between the lowest and highest values demonstrate significant differ-

ences in ESG practices between organizations and their home nations. The number of female directors on boards continues to be low because women make up less than 7% of total board members. The analysis includes control variables, which show that firms have average debt levels and profit performance, and their Tobin's Q values indicate they face different levels of expansion potential.

Table A2 in Appendix A reports the pairwise correlation matrix. The results indicate that the correlations among the explanatory variables are generally low to moderate, with no correlation exceeding commonly accepted thresholds.

3.2. Regression results

The study presents Table 2, which shows firm- and year-fixed effects regression results to analyze the connections between family ownership and ESG performance and board gender diversity and in-

vestment efficiency in non-financial firms operating in the MENA region. The research findings strongly validate the theoretical model, which demonstrates how ownership distribution, together with environmental, social, and governance results, and female board members affect organizational investment performance.

The research findings in Column (1) demonstrate that family ownership creates a positive relationship with investment efficiency at the 1% level. The research results validate *H1* because family ownership concentration creates better monitoring possibilities, which leads managers to focus on long-term firm value, thus minimizing their tendency to make inefficient investment choices (Saleh et al., 2023; Demsetz & Villalonga, 2001; Jensen & Meckling, 1976). Family owners in the MENA region function as essential internal governance entities because they maintain control over their businesses, which helps prevent managerial abuse

Table 2. Impact of family ownership and ESG performance on IE

Variables DV	(1) IE (H1)	(2) IE (H3)	(3) IE (Mediation) (H4)	(4) IE(Moderation) (H5)
OWN	0.044*** (3.12)		0.012* (1.89)	
ESG		0.039*** (4.86)	0.048*** (4.41)	0.026*** (3.97)
BGD				0.123 (1.21)
ESG × BGD				0.001*** (3.34)
SIZE	0.021*** (6.45)	0.039*** (5.98)	0.027*** (5.71)	0.019*** (5.66)
LEV	-0.064*** (-4.92)	-0.052*** (-4.11)	-0.049*** (-3.87)	-0.050*** (-3.91)
ROA	0.312*** (7.84)	0.284*** (7.12)	0.271*** (6.88)	0.269*** (6.41)
CASH	0.027** (2.43)	0.006** (2.18)	0.012** (2.06)	0.003** (2.09)
Tobin's Q	0.114* (1.78)	0.068** (2.31)	0.027** (2.24)	0.037** (2.21)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	3,245	3,245	3,245	3,245
Adj. R ²	0.287	0.301	0.309	0.316

Notes: This table reports the regression results examining the effects of family ownership and ESG performance on investment efficiency (IE). Column (1) tests the direct effect of family ownership on IE (H1). Column (2) examines the effect of ESG performance on IE (H3). Column (3) presents the mediation model including both family ownership and ESG performance (H4). Column (4) reports the moderation model, incorporating board gender diversity (BGD) and the interaction term between ESG performance and BGD (H5). T-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

of power and controls both excessive business expansion and insufficient business growth. The research findings match current studies, which show family ownership leads to better investment control when organizations have proper governance systems (Sun et al., 2024; Su et al., 2021).

The results in Column (2) show that ESG performance has a positive and statistically significant impact on investment efficiency ($\beta = 0.039$, $t = 4.86$), which confirms *H3*. Research supports the idea that ESG performance functions as an organizational control system that improves disclosure practices and minimizes knowledge gaps between investors and companies while preventing risky financial choices (Saleh et al., 2025; Velte, 2019; Benlemlih & Bitar, 2018). The capital allocation efficiency of firms in emerging markets improves when they demonstrate better ESG performance because their heterogeneous disclosure quality indicates stronger stakeholder monitoring and improved internal controls. The research findings support current empirical studies which demonstrate ESG-focused companies achieve better investment performance when operating in environments with limited institutional oversight (Gao et al., 2025).

The research in Column (3) combines ESG performance data with family ownership information to test the mediation hypothesis, which is stated in *H4*. The ESG coefficient remains positive and statistically significant, while the magnitude of the family ownership coefficient decreases and becomes only marginally significant. The observed pattern indicates that ESG performance acts as a significant mediator that links family ownership to investment efficiency. The research builds upon previous studies because it proves family ownership influences investment performance through two separate mechanisms, which include direct monitoring activities and ESG engagement promotion. Stakeholder theory supports family owners in implementing ESG practices because these practices help firms maintain legitimacy and achieve sustainability, which controls investment choices and minimizes market inefficiencies (Saleh et al., 2025; Al Amosh & Khatib, 2022).

The results reported in Column (4) investigate how board gender diversity affects the connection be-

tween ESG factors and investment performance. The statistical analysis shows that the ESG performance and board gender diversity interaction term ($ESG \times BGD$) produces a positive significant result ($\beta = 0.001$, $t = 3.34$), which confirms *H5*. The research shows that ESG performance creates better investment returns when companies have more women serving on their boards. Research findings support the resource dependence and agency perspectives because they demonstrate that boards with gender diversity improve their ability to monitor activities, their sensitivity to ethical matters, and their connection with stakeholders (Wang et al., 2025). Research studies have shown that female directors enhance the success of sustainability programs, which results in better environmental performance and governance standards for companies (Atif et al., 2021; Ali Gull et al., 2023).

The MENA region needs this moderating effect because it has not achieved sufficient female board member representation. The research indicates that board members who are women help organizations convert their ESG engagement activities into actual investment decisions that follow a structured approach. Research evidence confirms that board diversity functions as a governance boundary that strengthens the actual financial effects of ESG performance (Keisse & Jaafar, 2025).

The control variables show their expected patterns in all model specifications. The research findings show that investment efficiency increases with firm size and profitability (ROA), cash holdings, and Tobin's Q because these factors provide organizations with more resources and better prospects for expansion. The study shows that leverage is a negative factor that affects investment decisions because organizations face financial limitations and must manage their risk exposure (Harymawan et al., 2022; Saleh et al., 2025). The stability of these coefficients across specifications confirms that the main research results remain consistent.

The research findings in Table 3 demonstrate that family ownership creates a positive relationship with ESG performance, which produces significant results ($\beta = 0.118$, $t = 5.02$) that validate *H2*. The research results match stakeholder theory be-

cause Freeman (1984) explains that family-controlled businesses under stakeholder theory will focus on building long-term value and protecting their reputation through active ESG practice involvement. Family owners in the MENA region keep strong connections with their local community members and business partners, which makes ESG engagement their key strategy to protect their social value and ensure business continuity.

Table 3. Mediating effect of ESG performance in the Ownership-IE nexus

Variables	ESG (H2)
OWN	0.118*** (5.02)
SIZE	1.742*** (8.46)
LEV	-1.086*** (-4.38)
ROA	6.214*** (6.97)
CASH	1.903** (2.26)
Tobin's Q	0.421* (1.91)
Firm FE	Yes
Year FE	Yes
Observations	3,245
Adj. R ²	0.334

Notes: This table presents the regression results by examining the mediating role of ESG performance in the relationship between family ownership and investment efficiency. The dependent variable is ESG performance, and the model tests whether family ownership significantly influences ESG performance (H2). T-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

The agency-theoretic framework indicates that family owners implement ESG practices to create internal governance systems which boost transparency levels and decrease information gaps between controlling shareholders and minority investors (Jensen & Meckling, 1976). Research studies from emerging markets have proven that ownership concentration, together with long-term orientation, leads to better ESG disclosure and performance according to Al Amosh and Khatib (2022) and Benlemlih and Bitar (2018). The research finds essential evidence to support its mediation theory because it demonstrates that ESG performance acts as a mechanism that family ownership uses to enhance investment efficiency.

Table 4. GMM model specification

Variables	(1) IE	(2) IE (Interaction)
Lagged IE	0.241*** (6.18)	0.236*** (5.97)
OWN	0.003** (2.21)	
ESG	0.007*** (3.88)	0.005*** (3.21)
BGD		0.002 (1.34)
ESG ×BGD		0.001*** (2.96)
Controls	Yes	Yes
AR(1) p-value	< 0.001	< 0.001
AR(2) p-value	0.412	0.387
Hansen p-value	0.286	0.301
Sargan test	24.17	13.05
Observations	3,245	3,245

Notes: This table reports the results of the dynamic panel-data estimation using the Generalized Method of Moments (GMM) to examine the robustness of the relationship between family ownership, ESG performance, and investment efficiency (IE). T-statistics are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

The system GMM estimates in Table 4 analyze how family ownership together with ESG performance and board gender diversity affect investment efficiency (IE). The positive and statistically significant coefficient on lagged investment efficiency supports the dynamic specification of the model and indicates persistence in firms' investment behavior. The diagnostic tests show that the AR(1) statistic reaches significant levels, but the AR(2) statistic does not reach significance, and the Hansen test p-values remain acceptable, which confirms that the instrument set is valid and the GMM estimates are reliable.

The research findings demonstrate that family ownership creates positive relationships with investment efficiency while showing that ownership concentration leads to better investment control in Middle Eastern and North African markets. Family owners function as effective monitors according to agency theory because they successfully prevent the company from making inefficient investment decisions. The research shows that ESG performance directly affects investment efficiency through a positive connection, which indicates that better sustainability involvement leads

to better capital allocation through reduced information gaps and decreased agency conflicts (Saleh et al., 2025; Arellano & Bover, 1995; Blundell & Bond, 1998).

Model (2) shows that ESG performance and board gender diversity have a positive and statistically significant interaction, which means ESG performance enhances investment efficiency more in companies that have more women

on their board. The research shows that board members who are women create an essential governance environment that improves the success rate of ESG programs. The system GMM results show that family ownership and ESG performance directly affect investment efficiency while being resistant to endogeneity issues, and board gender diversity enhances these relationships in markets (Miroshnychenko et al., 2022; Al Amosh & Khatib, 2022).

CONCLUSION

The research examines how family ownership affects IE of MENA firms through the mediating role of ESG performance and the moderating role of BGD. The research uses non-financial companies to demonstrate that family control of businesses leads to better investment performance through two pathways, which include direct improvement and ESG performance enhancement. The research findings demonstrate that ESG engagement serves as an active governance system that goes beyond being a superficial practice because it operates effectively in markets with dominant family ownership and insufficient external oversight.

The research demonstrates that investment efficiency becomes more efficient when boards with diverse gender representation evaluate ESG performance. The study demonstrates that board structure plays a crucial role in converting sustainability-focused activities into actual financial results. The research shows that boards with diverse gender composition improve their ability to monitor company activities while becoming more sensitive to ethical matters and better attuned to stakeholder needs, which results in successful ESG initiative implementation through strategic investment choices. The research adds value to governance and ESG studies through its integration of family ownership with sustainability performance and investment efficiency into a single analytical system. The research findings indicate that MENA region businesses, together with their government officials, should enhance capital allocation through their support of trustworthy ESG standards and their promotion of women to serve on corporate boards.

Despite these contributions, the study is subject to limitations. ESG performance is measured using Refinitiv composite scores, which may not fully capture qualitative differences in ESG implementation. Moreover, the focus on non-financial firms in selected MENA countries may limit the generalizability of the findings. Future research could examine individual ESG pillars, explore alternative family ownerships such as institutional or state ownership, and conduct cross-regional comparisons to assess whether the governance role of ESG and board gender diversity varies across institutional contexts.

FUNDING

This work was supported and funded by Al-Zaytoonah University of Jordan under research project no. 24 / 02 / 2024-2025.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available upon reasonable request.

AI USE DISCLOSURE

No artificial intelligence tools were used in the writing, editing, or preparation of this manuscript.

AUTHOR CONTRIBUTIONS

Conceptualization: Isam Saleh.

Data curation: Arwa H. Amoush, Abdallah Alkhawaja.

Formal analysis: Isam Saleh, Abdallah Alkhawaja.

Investigation: Isam Saleh.

Methodology: Arwa H. Amoush.

Software: Isam Saleh, Abdallah Alkhawaja.

Supervision: Isam Saleh.

Validation: Arwa H. Amoush.

Visualization: Abdallah Alkhawaja.

Writing – original draft: Arwa H. Amoush, Abdallah Alkhawaja.

Writing – review & editing: Isam Saleh.

REFERENCES

1. Abdullah, A. (2025). Gender Diversity and ESG Performance: The Moderating Role of the Sustainability Committee. *Business Strategy and the Environment*, 35(3), 3878-3897. <https://doi.org/10.1002/bse.70336>
2. Afifa, M. A., Saleh, I., & Haniah, F. (2021). Direct and mediated associations among ownership structure, cash holdings and firm value: *The case of Jordanian insurance firms*. *Vision*, 25(4), 471-482. <https://doi.org/10.1177/0972262920983989>
3. Al Amosh, H., & Khatib, S. F. (2022). Ownership structure and environmental, social and governance performance disclosure: the moderating role of the board independence. *Journal of Business and Socio-Economic Development*, 2(1), 49-66. <https://doi.org/10.1108/JBSED-07-2021-0094>
4. Aladwey, L. M. A., & Alsudays, R. A. (2023). Does the cultural dimension influence the relationship between firm value and board gender diversity in Saudi Arabia, mediated by ESG scoring? *Journal of Risk and Financial Management*, 16(12), 512. <https://doi.org/10.3390/jrfm16120512>
5. Al-Hadi, A., Eulaiwi, B., Duong, L., Taylor, G., & Dutta, S. (2022). Family power and corporate investment efficiency. *Emerging Markets Finance and Trade*, 58(14), 4149-4161. <https://doi.org/10.1080/1540496X.2022.2088348>
6. Al-Hiyari, A., Ismail, A. I., Kolsi, M. C., & Kehinde, O. H. (2023). Environmental, social and governance performance (ESG) and firm investment efficiency in emerging markets: the interaction effect of board cultural diversity. *Corporate governance: the International Journal of Business in Society*, 23(3), 650-673. <https://doi.org/10.1108/CG-03-2022-0133>
7. Ali Gull, A., Hussain, N., Akbar Khan, S., Nadeem, M., & Mansour Zalata, A. (2023). Walking the talk? A corporate governance perspective on corporate social responsibility decoupling. *British Journal of Management*, 34(4), 2186-2211. <https://doi.org/10.1111/1467-8551.12695>
8. Alkhawaja, A., Hu, F., Johl, S., & Nadarajah, S. (2023). Board gender diversity, quotas, and ESG disclosure: Global evidence. *International Review of Financial Analysis*, 90, 102823. <https://doi.org/10.1016/j.irfa.2023.102823>
9. Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68(1), 29-51. [https://doi.org/10.1016/0304-4076\(94\)01642-D](https://doi.org/10.1016/0304-4076(94)01642-D)
10. Aroul, R. R., Sabherwal, S., & Vilupuram, S. V. (2022). ESG, operational efficiency and operational performance: evidence from Real Estate Investment Trusts. *Managerial Finance*, 48(8), 1206-1220. <https://doi.org/10.1108/MF-12-2021-0593>
11. Atif, M., Hossain, M., Alam, M. S., & Goergen, M. (2021). Does board gender diversity affect renewable energy consumption? *Journal of Corporate Finance*, 66, 101665. <https://doi.org/10.1016/j.jcorpfin.2020.101665>
12. Benlemlih, M., & Bitar, M. (2018). Corporate social responsibility and investment efficiency. *Journal of Business Ethics*, 148(3), 647-671. <https://doi.org/10.1007/s10551-016-3020-2>
13. Biddle, G. C., Hilary, G., & Verdi, R. S. (2009). How does financial reporting quality relate to investment efficiency? *Journal of Accounting and Economics*, 48(2-3), 112-131. <https://doi.org/10.1016/j.jacceco.2009.09.001>
14. Bilyay-Erdogan, S., Danisman, G. O., & Demir, E. (2024). ESG performance and investment effi-

- ciency: The impact of information asymmetry. *Journal of International Financial Markets, Institutions and Money*, 91, 101919. <https://doi.org/10.1016/j.intfin.2023.101919>
15. Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-143. [https://doi.org/10.1016/S0304-4076\(98\)00009-8](https://doi.org/10.1016/S0304-4076(98)00009-8)
 16. Demsetz, H., & Villalonga, B. (2001). Ownership structure and corporate performance. *Journal of Corporate Finance*, 7(3), 209-233. [https://doi.org/10.1016/S0929-1199\(01\)00020-7](https://doi.org/10.1016/S0929-1199(01)00020-7)
 17. Dogan Basar, B., Ekşi, İ. H., & Yudaruddin, R. (2025). Is ownership structure effective in the relationship between ESG and bank performance? *Journal of Financial Regulation and Compliance*, 33(3), 347-358. <https://doi.org/10.1108/JFRC-10-2024-0194>
 18. Doshi, M., Jain, R., Sharma, D., Mukherjee, D., & Kumar, S. (2024). Does ownership influence ESG disclosure scores? *Research in International Business and Finance*, 67, 102122. <https://doi.org/10.1016/j.ribaf.2023.102122>
 19. Eissa, A. M., Elgendy, T., & Diab, A. (2025). Earnings management, institutional ownership and investment efficiency: evidence from a developing country. *Journal of Financial Reporting and Accounting*, 23(3), 1206-1226. <https://doi.org/10.1108/JFRA-10-2022-0392>
 20. Eliwa, Y., Aboud, A., & Saleh, A. (2023). Board gender diversity and ESG decoupling: does religiosity matter? *Business Strategy and the Environment*, 32(7), 4046-4067. <https://doi.org/10.1002/bse.3353>
 21. Fiorillo, P., & Santilli, G. (2024). The influence of shareholder ESG performance on corporate sustainability: Exploring the role of ownership structure. *Finance Research Letters*, 67, 105800. <https://doi.org/10.1016/j.frl.2024.105800>
 22. Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Boston, MA: Pitman.
 23. Gao, D., Li, S., & Zhou, Y. (2025). Investment efficiency, ESG performance and corporate performance: evidence from Chinese listed enterprises. *Chinese Management Studies*, 19(2), 567-599. <https://doi.org/10.1108/CMS-06-2022-0210>
 24. Giordino, D., Sestino, A., Zámek, D., & Yahiaoui, D. (2025). The impact of institutional ownership structure on corporate ESG performance: empirical evidence for the European capital market. *Review of Managerial Science*, 20, 537-578. <https://doi.org/10.1007/s11846-025-00879-w>
 25. Harymawan, I., Nasih, M., Agustia, D., Putra, F. K. G., & Djajadikerta, H. G. (2022). Investment efficiency and environmental, social, and governance reporting: Perspective from corporate integration management. *Corporate Social Responsibility and Environmental Management*, 29(5), 1186-1202. <https://doi.org/10.1002/csr.2263>
 26. Hillman, A. J., Withers, M. C., & Collins, B. J. (2009). Resource dependence theory: A review. *Journal of Management*, 35(6), 1404-1427. <https://doi.org/10.1177/0149206309343469>
 27. Hu, W., Sun, J., Lin, Y. E., & Hu, J. (2023). ESG and investment efficiency: the role of marketing capability. *Sustainability*, 15(24), 16676. <https://doi.org/10.3390/su152416676>
 28. Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review*, 76(2), 323-329. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=99580
 29. Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
 30. Keisse, H. H., & Jaafar, A. (2025). The impact of ESG engagement and gender diversity on corporate investment efficiency: evidence from European listed firms. *Journal of Financial Reporting and Accounting*. <https://doi.org/10.1108/JFRA-01-2025-0086>
 31. Kim, E. (2025). The Effect of Foreign Investors on ESG Investment Efficiency: Evidence from South Korea. *Sustainability*, 17(5), 2267. <https://doi.org/10.3390/su17052267>
 32. Lee, H. S., Salas, J. M., Shen, K., & Yang, K. (2024). The effect of bond ownership structure on ESG performance. *Journal of Corporate Finance*, 89, 102678. <https://doi.org/10.1016/j.jcorpfin.2024.102678>
 33. Ma, Y., Ahmad, M. I., & Torelli, R. (2024). Board gender diversity and ESG disclosure: The moderating role of audit committee. *Corporate Social Responsibility and Environmental Management*, 31(6), 5971-5983. <https://doi.org/10.1002/csr.2895>
 34. Miroshnychenko, I., De Massis, A., Barontini, R., & Testa, F. (2022). Family firms and environmental performance: A meta-analytic review. *Family Business Review*, 35(1), 68-90. <https://doi.org/10.1177/08944865211064409>
 35. Mnasri, A., Temimi, A., & Arouri, H. (2025). Board gender diversity and ESG performance balance in GCC firms. *Finance Research Letters*, 80, 107352. <https://doi.org/10.1016/j.frl.2025.107352>
 36. Moradi, M., Yazdifar, H., Eskandar, H., & Namazi, N. R. (2022). Institutional ownership and investment efficiency: evidence from Iran. *Journal of Risk and Financial Management*, 15(7), 290. <https://doi.org/10.3390/jrfm15070290>
 37. Nam, H. J., Bilgin, M. H., & Ryu, D. (2024). Firm value, ownership structure, and strategic approaches to ESG activities. *Eurasian Business Review*, 14(1), 187-226. <https://doi.org/10.1007/s40821-024-00252-z>
 38. Nasta, L., Magnanelli, B. S., & Ciaburri, M. (2024). From profits to purpose: ESG practices, CEO compensation and institutional ownership. *Management Decision*, 62(13), 46-68. <https://doi.org/10.1108/MD-06-2023-0932>
 39. Omenihu, C. M., Abdrakhmanova, M., & Koufopoulos, D. N. (2025). Board Gender Diversity

- and Environmental, Social, and Governance (ESG) Disclosure in Developed Countries. *Administrative Sciences*, 15(4), 141. <https://doi.org/10.3390/admsci15040141>
40. Otero, L., Alaraj, R., & Lado-Sestayo, R. (2020). How corporate governance and ownership affect banks' risk-taking in the MENA countries? *European Journal of Management and Business Economics*, 29(2), 182-198. <https://doi.org/10.1108/EJMBE-01-2019-0010>
 41. Rabbani, M. R., Kiran, M., Bhuiyan, A. B., & Al-Hiyari, A. (2024). Does diversity in top management and boards affect ESG performance? Evidence from Islamic and conventional banks in the MENA region. *International Journal of Islamic and Middle Eastern Finance and Management*, 17(6), 1244-1266. <https://doi.org/10.1108/IMEFM-06-2024-0281>
 42. Richardson, S. (2006). Over-investment of free cash flow. *Review of Accounting Studies*, 11(2-3), 159-189. <https://doi.org/10.1007/s11142-006-9012-1>
 43. Saleh, I., Abu Afifa, M., & Alkhwaja, A. (2025). Environmental, social, and governance (ESG) disclosure, earnings management and cash holdings: Evidence from a European context. *Business Ethics, the Environment & Responsibility*, 34(2), 295-308. <https://doi.org/10.1111/beer.12650>
 44. Saleh, I., Afifa, M. A., & Alkhwaja, A. (2023). Internal corporate governance mechanisms and earnings manipulation practices in MENA countries. *Economic Research-Ekonomska Istraživanja*, 36(2). <https://doi.org/10.1080/1331677X.2022.2134902>
 45. Saleh, I., Afifa, M. A., Al-Hawtmah, Z., & Albakkar, O. (2022). Earnings management, earnings quality, board gender diversity and cost of equity capital: Evidence from an emerging market. *Global Business Review*, 09721509221133513. <https://doi.org/10.1177/09721509221133513>
 46. Su, C., Liu, X., & Shao, H. (2021). Does the preference of family board seats allocation influence corporate investment efficiency? *Nankai Business Review International*, 12(4), 515-536. <https://doi.org/10.1108/NBRI-02-2021-0009>
 47. Sun, J., Pellegrini, M. M., Dabić, M., Wang, K., & Wang, C. (2024). Family ownership and control as drivers for environmental, social, and governance in family firms. *Review of Managerial Science*, 18(4), 1015-1046. <https://doi.org/10.1007/s11846-023-00631-2>
 48. Tang, D. Y., Yan, J., & Yao, Y. (2025). The determinants of ESG ratings: Rater ownership matters. *Journal of Accounting Research*, 64(2), 1087-1130. <https://doi.org/10.1111/1475-679X.70016>
 49. Toumeh, A. A. (2025). The Recent Corporate Governance Code and Company Performance: CEO Tenure as a Moderator. *Australasian Accounting Business and Finance Journal*, 19(3), 186-214. <https://doi.org/10.14453/aabf.v19i3.09>
 50. Velte, P. (2019). The bidirectional relationship between ESG performance and earnings management: Empirical evidence from Germany. *Journal of Global Responsibility*, 10(4), 322-338. <https://doi.org/10.1108/JGR-01-2019-0001>
 51. Wang, G., Zhang, M., Ji, Z., & Qian, J. (2025). Investment efficiency and ESG performance: Does board governance matter? *Finance Research Letters*, 107982. <https://doi.org/10.1016/j.frl.2025.107982>
 52. Wu, W., Alkaraan, F., & Le, C. (2025). The moderating effects of corporate governance and investment efficiency on the nexus between financial flexibility and firm performance. *Journal of Financial Reporting and Accounting*, 23(6), 2573-2598. <https://doi.org/10.1108/JFRA-05-2023-0234>
 53. Zhang, S. (2024). The impact of digital transformation on ESG performance and the moderation of mixed-ownership reform: The evidence from Chinese state-owned enterprises. *Corporate Social Responsibility and Environmental Management*, 31(3), 2195-2210. <https://doi.org/10.1002/csr.2656>
 54. Zhu, N., Nagriwum, T. M., & Saeed, U. F. (2025). Advancing ESG Performance in MENA Economies: Do Governance Structures and Eco-Technology Matter? *Corporate Social Responsibility and Environmental Management*, 32(6), 7793-7815. <https://doi.org/10.1002/csr.70111>

APPENDIX A

Table A1. Variable definitions

Variable	Label	Measurement
Investment Efficiency	IE	Measured as the negative absolute value of residuals from the investment model following Richardson (2006); higher values indicate greater investment efficiency
Family Ownership	OWN	Percentage of shares owned by family members and related entities
ESG Performance	ESG	Composite ESG score ranging from 0 to 100 obtained from Refinitiv
Board Gender Diversity	BGD	Percentage of female directors on the board
Firm Size	SIZE	Natural logarithm of total assets
Leverage	LEV	Total debt divided by total assets
Return on Assets	ROA	Net income divided by total assets
Cash Holdings	CASH	Cash and cash equivalents divided by total assets
Tobin's Q	Tobin's Q	Market value of assets divided by book value of assets

Table A2. Correlation matrix

Variable	IE	OWN	ESG	BGD	SIZE	LEV	ROA	CASH	TobinQ
IE	1.000								
OWN	.012*	1.000							
ESG	0.27	0.45*	1.000						
BGD	0.14	0.25*	0.44*	1.000					
SIZE	0.20*	0.17	0.20*	0.19*	1.000				
LEV	−0.22*	−0.06	−0.23	−0.02*	0.42	1.000			
ROA	0.13	0.39	0.48*	0.36*	0.55*	−0.17*	1.000		
CASH	0.17*	0.11*	0.04*	0.28	−0.01*	−0.33	0.58	1.000	
TobinQ	0.24	0.14	0.02	0.02	0.05*	−0.10	0.16*	0.03	1.000

Note: * Significance at the 0.05 level.