

THE ROLE OF CORPORATE ENVIRONMENTAL SUSTAINABILITY AND TOP MANAGEMENT CHARACTERISTICS UNDER CORPORATE LAW IN FIRM PERFORMANCE: EVIDENCE FROM SAUDI ARABIA LISTED COMPANIES

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Abstract

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This study investigates how corporate environmental sustainability (CSR) and top management (TM) characteristics respond to Saudi corporate law to determine their impact on the performance of firms listed on the Saudi Stock Exchange. It relies on the perspectives of corporate governance and legal compliance to explore whether TM qualities, including team size, female representation, accounting and financial expertise, and sustainability practices, influence corporate performance in a regulated environment. The analysis proceeds on the premise of panel data of 131 listed companies between 2015 and 2021, which provides 917 firm-years of data retrieved through the Bloomberg database. Baseline relationships were estimated using ordinary least squares (OLS) regression, and two-stage least squares (2SLS) were used to handle possible endogeneity. Heteroscedasticity and serial correlation were corrected using the feasible generalized least squares (FGLS) regression. The results indicate that the composition and expertise of TM play a vital role in the firm's performance. Reduced female representation is linked to poor performance, and accounting and finance expertise has a positive and significant impact. The governance and legal appropriateness of sustainability-based leadership are also evident in the fact that CSR practices improve firm performance.

Keywords: Corporate Law, Corporate Governance, Environmental Sustainability, Top Management Characteristics, Gender Diversity, Firm Performance, Saudi Arabia

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1. INTRODUCTION

The characteristics of individuals in leadership positions are crucial for the long-term financial and operational success of an organization. The top management (TM) team must possess diverse experience, abilities, and expertise to make informed planning decisions (Alzate-Alvarado et al. 2025). According to theoretical studies, the size, diversity, and professional backgrounds of the team, as well as the number of women in leadership positions, are important factors that affect how well decisions are made, risks are managed, and how companies deal with environmental and economic problems (Alodat et al., 2024; Hambrick & Mason, 1984; Adams & Ferreira, 2009). A larger and more heterogeneous team of managers provides more opinions, which reduces the possibility of errors and makes the process of innovating and developing new strategies easier (Eisenhardt, 2013). They are increasingly becoming significant in developing markets such as Saudi Arabia, where business structures are defined by cultural and organizational concerns. Leaders should possess a diverse set of skills to be successful. According to recent research, the presence of women in TM results in improved decision-making, improved government, and a company that is more concerned about what is best for all its stakeholders. However, it will be more difficult for women in Saudi Arabia to have a real impact on strategic decisions due to cultural and organizational barriers. This may be the reason why certain studies have reported negative or minimal effects (Abadi et al., 2022).

Another significant factor that influences a company's performance is the financial history of its top managers (Pavlatos & Kostakis, 2018). These backgrounds provide a thorough knowledge of financial controls, financial information, and the power to monitor earnings management processes, which raises transparency and lowers risk (DeFond & Francis, 2005; Charchaafa & Kimouche, 2024; Jangjarat et al., 2026; Khalil et al., 2025; Wang, 2026; Sari et al., 2025; Sudiyanto & Kurniawan, 2025). The study found that companies with accountants who have a lot of experience can better handle changes in the economy and make plans for long-term growth. On the other hand, corporate environmental sustainability (CSR) has grown into a key strategy tool that shows how dedicated a business is to green and social standards. It changes the company's image and ties with important people, which improves its business and financial success (Waddock & Graves, 1997; Margolis & Walsh, 2003; Alobaid et al., 2024). According to new research, CSR not only boosts direct performance but also acts as a catalyst that boosts the impact of leadership traits on performance. This makes the workplace more cohesive, which helps the company achieve its long-term goals.

The three main ideas that this study is built around are as follows: first, agency theory states that TM teams should be set up in a certain way to keep owners and management from fighting and to make it easier to monitor strategic decisions (Jensen & Meckling, 1976). Two more ideas are the theory of consumers and the idea that using CSR can help

make the needs of various groups of people more equal. It will work better in the long run and have fewer legal and social risks than the other two. This brings us to the third theory: truth. This suggests that good governance and social practices will help a group be accepted by society and the government. This will also make resources last longer and help agencies trust each other.

The study used numbers from the Bloomberg database for 131 companies from 2015 to 2021. Each year, 917 notes were made. We used ordinary least squares (OLS) models to find the most important links, and a two-stage least squares (2SLS) model to handle the issue of possible cause overlap. With a feasible generalized least squares (FGLS) regression model, problems with heteroscedasticity and autocorrelation were also fixed. This made the data more accurate and useful. It was found that the size of the TM team is related to how well the business does. On the other hand, performance goes down when there are more women on the team. This could be because of culture and organizational hurdles. Backgrounds in accounting and finance have a positive and important effect. CSR, on the other hand, has a partly positive effect because it improves the link between the executive board and the success of the company (Kabir & Thai, 2017; Hasan et al., 2024; Charchaafa & Kimouche, 2024; Alobaid et al., 2024; Anh et al., 2024). This shows that these links are causal, not just correlational.

This work stands out in more than one way compared to other pieces of writing that have been previously written. It presents the Saudi market with new pieces of real-life evidence of the relationship between various forms of TM, CSR, and business performance. This emphasizes the fact that these aspects are peculiar to the culture and business. This further demonstrates how the attributes of top managers can assist a business in improving by examining factors such as the number of individuals in the team, the number of women, and the experience that top managers have in accounting and finance. It also demonstrates the value of CSR as a mechanism for enhancing the impact of robust leadership on performance. In this study, the heteroscedasticity and cause relationship are addressed using advanced statistics (OLS, FGLS, and 2SLS). This makes the data more precise. Lastly, the research informs investors and decision-makers how to improve administration, place more women in leadership positions, master finance and accounting, and utilize CSR to ensure results and make them long-lasting. Therefore, this is a good source for future research in similar developing countries.

The remainder of this paper is organized as follows. Section 2 addresses the literature analysis and development of the study hypothesis. Section 3 defines the study strategy, which entails sampling, measuring variables, and defining the model used. Section 4 provides empirical findings and results on the strength of the tests. Section 5 discusses the results and their theoretical and practical implications. Section 6 concludes the paper, providing an overview of the study and recommendations for future research.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

The key variables in this research are those that influence the performance of the institution's job. These are executive size, women on the team, the accounting and finance background of those in charge, CSR, and its impact on the institution's effectiveness in its work (Goll et al., 2001; Wu et al., 2022). These are considered because top managers make most of the strategic decisions within a business. They establish the financial and operating objectives of the company and significantly influence the success and sustainability of the company's money. A larger and more heterogeneous management team facilitates knowledge and experience sharing among people and reduces the chances of making decisions independently (Yao, 2023). It is also believed that having women in top positions enhances the government and makes the company more sensitive to all needs; however, in reality, this is not always the case in Saudi Arabia due to cultural and organizational barriers.

The financial and accounting history of TM is regarded as a significant component of ensuring the existence of transparency and financial management. The latter can be explained by the fact that it becomes simpler to monitor financial decisions, introduce disclosure requirements, and prevent individuals from inflating non-necessary earnings (Mowchan, 2023). However, CSR is highly significant in that it not only directly enhance financial performance but also reinforces the relationship with the stakeholders and a good reputation of the company (Bhattacharya et al., 2009). This makes the leadership attributes have a greater impact on the performance of the institutions. The three major theories that this study employs in explaining the relationship between the factors are: Some theories explain why good TM teams are important to ensure that the conflicts between the shareholders and the management are minimized as much as possible, and also, the strategies are well monitored. They are stakeholder theory (social responsibility practices may enable companies to make long-term profits) and legitimacy theory (adopting good governance, social and environmental practices causes people and government agencies, like a company, to be more, which is good for its image and finances). Using this theoretical frame, the research tries to clarify the theoretical relationships that exist between TM, CSR, and corporate performance, and the role that the various variables contribute to influencing corporate performance. The study theories are also supported by the theory framework that has scientific evidence. This provides us with a solid foundation for testing the relationship between the factors with numeric data and complicated techniques such as OLS, FGLS, and 2SLS.

2.1. Corporate environmental sustainability and firm performance

Sustainability in business environments has become one of the most important strategic factors that

influences the success of businesses in terms of finances and operations. It depicts a company's ability to manage its resources and harm the environment, according to Waddock and Graves (1997), Margolis and Walsh (2003), and Alobaid et al. (2024). This enhances the company's image among customers, investors, and officials. Business plans in Saudi Arabia make it a large consideration of environmental sustainability due to Saudi Vision 2030. This strategy informs businesses that they should be kind to the environment so that they can expand sustainably and enhance society. According to Anh et al. (2024), good environmental practices by businesses make them more efficient, reduce long-term costs, and increase their capability to attract investments because they have a good reputation for being environmentally friendly.

Several theories can be used to explain the link between environmental safety and business success. First, there is stakeholder theory, which states that companies that care about the environment consider the needs of many different groups, which improves their overall financial and business performance. Second, there is the validity theory, which states that being environmentally friendly makes a business more stable and long-lasting because it is seen as legal and socially acceptable. Third, the resource-based view states that protecting the environment is a long-term economic benefit that helps a business run more efficiently and come up with new ideas. Alobaid et al. (2024) and Hasan et al. (2024), both recent empirical studies, show that companies that invest in environmental practices perform better financially. This is especially true in emerging markets, where investors see environmental compliance as a good sign and trust the company. It looks like engaging in environmental sustainability not only helps businesses perform better financially but also makes it easier to deal with operational and environmental risks. This makes the business more stable and customers and other stakeholders happier.

This is a summary of the way environmental sustainability and success are linked: companies that invest in recycling, energy management, environmental resources, and lowering emissions become more operationally efficient, lower their legal risks, and boost investor trust. All of these factors have a positive effect on their income and return on investment. Sustainability in the environment also works as a trigger that boosts the effect of TM traits on company performance, creating a long-lasting setting that supports strategy choices and encourages new ideas within the company. From the above, the following study theory about environmental survival can be drawn:

H1: There is a link between a company's environmental responsibility and its performance.

2.2. Top management characteristics and firm performance

The traits of the people in charge of a business are important in determining its long-term financial and operational success (Simon et al., 2015). The skills and knowledge of the executive team determine how well-planned choices work out. The theoretical

literature states that having a large and diverse TM team makes it easier for people to share their knowledge and experience and see things from different points of view. This makes it easier for the company to reach its strategic goals and lowers the risks associated with making decisions independently. New studies show that leadership teams that are bigger and more diverse are better at strategic planning, encourage new ideas, and come up with more complete answers to difficult problems. This is good for the company's practical and financial performance.

Top managers who possess professional, accounting, and financial backgrounds are another aspect of this matter that has been discussed in the literature (Pavlatos & Kostakis, 2018). Experience is essential in ensuring that finances are clear, improving internal control, and acquiring a good picture of a company's financial situation. These skills are required to implement accounting standards and audit financial statements to a better extent to reduce the risks of earnings management and provide investors and other stakeholders with more confidence in financial information (DeFond & Francis, 2005; Charchaafa & Kimouche, 2024). It has been demonstrated in Saudi Arabia that the presence of accounting and financial professionals in TM contributes to adherence to rules, enhancement of internal control, and long-term business development plans.

In terms of the number of women in TM, international studies have shown that women leaders lead to better governance and transparency, make management more aware of the needs of different stakeholders, and lead to better financial and operational performance (Adams & Ferreira, 2009). However, the culture and organizational setting in Saudi Arabia suggest that there may be problems that make it harder for women to be leaders. Two of these problems are traditional limits on active involvement in decision-making and a lack of full institutional support. They can have mixed effects or even hurt performance in some cases (Abadi et al., 2022).

A few simple models can be used to show how the traits of top managers affect how well they do their jobs (Colbert et al., 2014). Here's the first thing that agency theory says: TM teams are needed to keep owners and management from disagreeing and to keep a closer eye on strategy choices. According to Jensen and Meckling (1976), this lowers the risks of each person's choice and makes the company run better generally. According to the resource-based view, the different skills and experiences of the people in TM are a strategic resource that gives a company a long-term competitive edge by making it easier to adapt to changes in the market and the environment and come up with new ideas. Third, stakeholder theory says that good leadership helps a business last for a long time by making sure that everyone is happy, meeting the needs of all stakeholders, and improving all areas of the business. The results of new studies show that businesses that have large, diverse TM teams with people who know about accounts and money do better financially and operationally. Hasan et al. (2024) and Charchaafa and Kimouche (2024) also say

that having women on the leadership team may lead to better work as long as they can make choices. There should be a good mix of men and women in TM, with the right number of women, and with specialized knowledge in finance and accounting. This will help the company make better strategic decisions, deal with economic and environmental problems better, and be more competitive. There is a link between the qualities of top managers and the growth of a company, as suggested by what has been said:

H2: It is true that the size of the top management team is related to how well the company does.

H3: There is a link between the accounting and financial knowledge of top managers and the success of the company.

H4: There is a strong link between the number of women in top management and how well a company does.

2.3. The moderating effect of corporate environmental sustainability on the relationship between top management characteristics and firm performance

The success of strategic decisions highly depends on the skills and knowledge of their top team members; thus, the qualities of TM significantly contribute to the success of a firm in sustaining healthy financial and practical performances (Goll et al., 2001). According to some theories, a large and diverse executive group eases the process of people sharing their knowledge and experience, and it also contributes to making better decisions by people on behalf of the company (Cannella et al., 2009). This is because larger decision-making teams have more risks than smaller teams. According to new research, larger and more diverse leadership teams are more effective in strategic planning, promoting new ideas, and developing more holistic resolutions to challenging issues. This is beneficial to the practical and financial performance of the company.

One more point talked about in the literature is the importance of professional, accounting, and financial backgrounds of top managers (Pavlatos & Kostakis, 2018). The reason is that experience is important in ensuring that finances are transparent, improved internal control and adequate visualization of the financial position of a business. These skills are required to apply accounting standards and audit financial statements more effectively to reduce risks of earnings management and have more confidence in financial statements by the investors and other stakeholders (DeFond & Francis, 2005; Charchaafa & Kimouche, 2024). These skills in Saudi Arabia are significance in assisting individuals in adhering to the rules and regulations, enhancing internal control and assisting businesses to grow in the long term. With regards to the percentage of women in TM, the international studies have indicated that women leaders result in improved governance and transparency, make the management more attentive to the needs of various stakeholders and result in improved financial and operational performance (Adams & Ferreira, 2009). Nevertheless, the culture and

organizational environment in Saudi Arabia indicate that there are issues which could make women less likely to become leaders. Other issues are archaic restrictions on active involvement in the decision-making process or incomplete formal assistance that may occasionally be both positive and negative (Abadi et al., 2022).

Theoretically, it is possible to have several simple models which can be applied to understand the impact of the characteristics of top managers on success. To begin with, the agency theory emphasizes that TM teams should avoid conflicts between shareholders and management and enhance the management of strategic decisions. This reduces the risks of individual choices, and the overall performance of the firm is enhanced (Jensen & Meckling, 1976). Second, the resource-based perspective adds that the various capabilities and experiences of the TM members constitute a strategic resource, enhancing a company with long-term competitive advantage by facilitating the easy generation of new ideas and adaptation to environmental changes in the market. Third, the stakeholder theory indicates that effective leadership can enable any business to live long because it ensures everybody is satisfied, and the needs of all stakeholders are fulfilled, as well as enhancing financial and operational prosperity. Recent research indicates a stronger financial and accounting performance by the company, as well as a smoother operation in the company that has a large, diverse, and financially and accounting savvy TM team. Moreover, the presence of women in charge would probably help to conduct operations more efficiently, provided that they have the right to make decisions (Hasan et al., 2024; Charchaafa & Kimouche, 2024). The findings indicate that the appropriate number of women in TM, the appropriate combination of financial and accounting skills in men and women, and the women in those roles collectively make better strategic decisions and assist the company in overcoming the economic and environmental issues, as well as to become more competitive in general.

Similarly, recent research indicates that the environmentally friendly company not only fare better in terms of financial matters and operations, but it can also alter the extent to which the relation between the qualities of the top managers and the business performance is strong. When the eco-friendly methods are applied in businesses, the results may be superior provided that the individuals in charge are highly knowledgeable, well versed in a variety of skill sets, and encounter numerous work scenarios. According to Anh et al. (2024) and Alobaid et al. (2024), these long-term external influences assist in making strategic choices more helpful and reducing risks associated with making individual or quick choices. Maintaining the environment is an additional resource that will enable people in positions of power use their knowledge and skills better. Environment-friendly programs have the potential to identify new ideas

and smooth out processes, and this may assist a business to earn more money and compete better. Stakeholder theory also gives testimony to this notion. According to it, decisions taken by top managers in an environmentally conscious workplace are capable of satisfying the needs of numerous individuals, which is both productive and profitable. The correlation between the attributes of top managers and the success of the company is reinforced in the real world by sustainability in the environment. The companies that employ various leaders with finance and accounting expertise and intend to be environmental friendly perform better than those that are not concerned about the environment. According to Alobaid et al. (2024) and Hasan et al. (2024), this effect is more evident in the markets that place importance on environmental regulations and long-term government. Based on what has been said, the following study assumptions can be made:

H5: The environmental safety of a company works as a moderating factor that strengthens the positive link between the success of the company and the size of its management team.

H6: Sustainable business practices for the environment help to balance out the positive link between having women in top management and good business results.

H7: The environmental sustainability of a company serves as a moderating factor that strengthens the positive link between the accounting and financial background of top management and the success of the company.

3. RESEARCH METHODOLOGY

3.1. Data collection

The analysis focuses on all Saudi market companies with the necessary data accessible between 2015 and 2021. Based on the availability of CSR data in the Bloomberg database, we chose the Saudi market as our starting sample. It omitted businesses without CSR reports, resulting in 917 firm-year observations from 131 firms. Bloomberg's database provided information on business environmental sustainability, and data stream provided information on company performance and TM characteristics (Saeed et al., 2025). To achieve the research objectives, the association between TM features and company performance was examined using OLS regression (Hu & Chen, 2025). This study also examined how CSR affects the relationship between TM traits and business performance, with particular emphasis on the moderating effect.

3.2. Measurement of all variables

This section describes the methods for measuring all variables, including independent, control, and dependent variables.

Table 1. The definitions and measurements of all variables

<i>Name of variable</i>	<i>Abbreviation</i>	<i>Measurement of a variable</i>
Firm performance	<i>MVA</i>	The log of the difference between the equity's market value and book value is used to calculate it.
Corporate environmental sustainability	<i>CSR</i>	According to Saeed et al. (2025), a company's level of environmental, social, and governance (ESG) disclosures determines its Bloomberg score.
The size of the top management team (number)	<i>SOTM</i>	It shows how many people make up the top management team (Deng et al., 2025).
Women in top management (ratio)	<i>WITM</i>	It is measured as the ratio of the number of women in top management positions to the total number of members in these positions, as in the studies of Yang and Konrad (2025).
Accounting and finance experience of the top management team (number)	<i>AFATM</i>	It shows how many people in the top management team have expertise in finance and accounting (Pavlatos & Kostakis, 2018).
Total assets	<i>LTA</i>	The market capitalization logarithm (Al-Matari, 2025; Farooq et al., 2025; Hasanatun et al., 2025; Mansour et al., 2024).
Loss	<i>LOSS</i>	It is measured by a single dummy variable, which is 0 if the company is losing and 0 otherwise (Al-Matari, Alnor, et al., 2026; Cai et al., 2016).
Growth	<i>GRTH</i>	It is computed by dividing the sales change by the sales lag (Lo & Sheu, 2007; Shubita, 2022).
Leverage	<i>LVG</i>	It is measured by total debts to total assets (Al-Matari, 2026, Faqera et al., 2026).
Big4	<i>Big4</i>	According to Al-Matari, Turki, et al. (2026) and Rahman et al. (2024), it is measured by <i>Big4_Auditor</i> = 1 → if audited by Deloitte, PwC, EY, or KPMG, or 0 → otherwise.
Years	<i>YRS</i>	A dummy variable (Algrady et al., 2025; Cai et al., 2016).
Corporate environmental sustainability + The size of the top management team	<i>CSR_SOTM</i>	It is measured by the interaction between corporate environmental sustainability + The size of the top management team.
Corporate environmental sustainability + Women in top management	<i>CSR_WITM</i>	It is measured by the interaction between corporate environmental sustainability + Women in top management.
Corporate environmental sustainability + Accounting and finance experience of the top management team	<i>CSR_AFATM</i>	It is measured by the interaction between corporate environmental sustainability + Accounting and finance experience of the top management team.

Source: Authors' elaboration.

3.3. Model regression

OLS regression implies a linear correlation between the role of CSR, TM characteristics, and firm performance. Additionally, this study investigates the influence of environmental sustainability on the connection between TM characteristics and firm performance, specifically focusing on the moderator role. However, in numerous real-life situations, the connection may exhibit nonlinear characteristics.

By utilizing this methodology, the variables can be modified to encompass non-linear associations, hence enabling the creation of a more precise regression model. Hence, OLS regression analysis is employed to examine the correlation between CSR, TM characteristics, and firm performance. This study, similar to previous studies conducted by Hu and Chen (2025) and Zhang et al. (2025), illustrates the regression equation as follows:

$$MVA = \alpha_0 + \beta_1 \times SOTM_{i,t} + \beta_2 \times WITM_{i,t} + \beta_3 \times AFATM_{i,t} + \beta_4 \times CSR_{i,t} + \beta_5 \times LTA_{i,t} + \beta_6 \times LOSS_{i,t} + \beta_7 \times GRTH_{i,t} + \beta_8 \times LEVG_{i,t} + \beta_9 \times Big4_{i,t} + \beta_{10} \times YRS_{i,t} + \varepsilon \tag{1}$$

$$MVA = \alpha_0 + \beta_1 \times SOTM_{i,t} + \beta_2 \times WITM_{i,t} + \beta_3 \times AFATM_{i,t} + \beta_4 \times CSR_{i,t} + \beta_5 \times CSR_SOTM_{i,t} + \beta_6 \times CSR_WITM_{i,t} + \beta_7 \times CSR_AFATM_{i,t} + \beta_8 \times LTA_{i,t} + \beta_9 \times LOSS_{i,t} + \beta_{10} \times GRTH_{i,t} + \beta_{11} \times LEVG_{i,t} + \beta_{12} \times Big4_{i,t} + \beta_{13} \times YRS_{i,t} + \varepsilon \tag{2}$$

3.4. Description of alternative methods

The approach examines the differences between OLS and random effects (RE) models using the Breusch-Pagan Lagrangian multiplier (LM) test. These approaches vary mostly in how they address the effect on people. In order to determine if UI has a chance of impact, a statistical test may be conducted depending on its presence or absence. For this assessment, the Breusch-Pagan LM test is a suitable option. If $UI = 0$ for every i , then there is no individual variation. This is the test's central concept. The shared OLS model is considered to be excellent when the prob. > chi² number is higher than 0.05. Breusch and Pagan (1979, 1980) claim

that the shared OLS approach is superior in these sorts of circumstances. Table 2 further demonstrates that the chance value (prob. > chi²) is less than 0.05 according to the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity. The difficulty may be resolved by running the model using strong estimation techniques as Eicker (1963) or White (1980), since Table 2 indicates that the data is heteroskedastic. The concept of "resilient standard errors" was initially introduced by Huber (1967). Since then, improved methods for determining solid standard errors in various contexts, such as with cross-sectional and time-series data, have been developed. Strong standard errors may be used to address the heteroskedasticity issue (Huber, 1967).

Table 2. Testing for Breusch and Pagan LM test and Breusch-Pagan/Cook-Weisberg test

<i>Breusch and Pagan Lagrangian multiplier test for RE</i>		<i>Breusch-Pagan/Cook-Weisberg test for heteroskedasticity</i>	
Chi ² (01)	0.000	Chi ² (1)	18.67
Prob. > chi ²	> 0.05 (1.0000)	Prob. > chi ²	<0.05 (0.0000)

Source: Authors' elaboration.

4. EMPIRICAL RESULTS

The descriptive analysis of the variables, as shown in Table 3, showed that the average log *MVA* was 5.95, reflecting a relative variance in the sizes of the companies included in the sample. *CSR* practices also recorded an average of 0.97, indicating an acceptable level of companies' adoption of sustainability activities. The characteristics of the management team structure varied; the average proportion of *WITM* was approximately 0.49, while the average *SOTM* was 0.34, and the average *AFATM* was 0.57, reflecting a notable diversity in the composition of TM teams. As for the control variables, *LTA* recorded an average of 6.01, while

the performance variables showed that *LOSS* was 0.26, the *GRTH* rate was 0.35, and *LEVG* results showed an average of 0.41. Furthermore, 0.44% of the companies were audited by a *Big 4* audit firm.

When the variance inflation factor (*VIF*) was used to check for multicollinearity between variables, all the values were within the statistically acceptable range of 1.01-1.49. This is much lower than the critical threshold of 10, which, according to Hair et al. (2012), means that there is a significant multicollinearity problem. This indicates that there is no significant problem with multicollinearity between the independent factors. This makes the regression models used in this study more reliable.

Table 3. Descriptive statistics and multicollinearity test

<i>Variable</i>	<i>Obs.</i>	<i>Mean</i>	<i>Std. dev.</i>	<i>Min</i>	<i>Max</i>	<i>VIF</i>	<i>1 / VIF</i>
<i>MVA</i>	917	5.9548	0.7928	2.0492	8.5698	-	-
<i>CSR</i>	917	0.9797	0.7178	-0.0405	2.7838	1.13	0.886
<i>SOTM</i>	917	0.3424	0.4748	0.0000	1.0000	1.49	0.670
<i>WITM</i>	917	0.4984	0.8034	0.0000	4.0000	1.00	0.996
<i>AFATM</i>	917	0.5769	0.4943	0.0000	1.0000	1.47	0.678
<i>LTA</i>	917	6.0105	1.6620	0.0000	9.2820	1.02	0.978
<i>LOSS</i>	917	0.2672	0.4427	0.0000	1.0000	1.12	0.889
<i>GRTH</i>	917	0.3531	13.8985	-82.1065	409.3897	1.01	0.989
<i>LEVG</i>	917	0.4170	0.2379	0.0000	1.0156	1.1	0.913
<i>Big4</i>	917	0.4427	0.4970	0.0000	1.0000	1.13	0.888
Mean VIF							1.16

Note: All variables are defined as provided in Table 1, * > 0.1, ** > 0.05 and *** > 0.01, respectively.

Source: Authors' elaboration.

The results of the Pearson correlation analysis are presented in Table 4. This was done to determine the strength of the association between the study factors. The correlation coefficient (*r*) numbers in this table show how strongly the factors are linked to each other and how well they can measure that link. Hair et al. (2012) stated that a correlation number of 0 means there is no link, and ± 1.0 means there is a perfect relationship. Cohen (1988), on the other hand, provided a more detailed explanation of correlations ranging from

0 to 1.0. Cohen's scale states that a correlation (*r*) between ± 0.1 and ± 0.29 indicates a weak link, between ± 0.30 and ± 0.49 indicates a moderate relationship, and above ± 0.50 indicates a significant relationship. The results of the study showed that all the relationships had values less than 0.80. This is in line with Gujarati and Porter (2009), who stated that the correlation matrix should not be more than 0.80 to ensure that multicollinearity is not present in the study.

Table 4. Correlation analysis

<i>Variable</i>	<i>MVA</i>	<i>CSR</i>	<i>SOTM</i>	<i>WITM</i>	<i>AFATM</i>	<i>LTA</i>	<i>LOSS</i>	<i>GRTH</i>	<i>LEVG</i>	<i>Big4</i>
<i>MVA</i>	1.000									
<i>CSR</i>	0.375***	1.000								
<i>SOTM</i>	0.031	0.045	1.000							
<i>WITM</i>	-0.113***	-0.012	-0.012	1.000						
<i>AFATM</i>	0.104***	0.050	-0.553***	0.025	1.000					
<i>LTA</i>	0.041	0.047	0.071**	-0.021	0.009	1.000				
<i>LOSS</i>	-0.133***	-0.193***	-0.067	-0.017	0.059	0.036	1.000			
<i>GRTH</i>	0.077**	0.056	-0.021	-0.017	-0.041	0.043	-0.014	1.000		
<i>LEVG</i>	0.094***	0.038**	0.093***	0.036	0.003	0.020	0.215	-0.021	1.000	
<i>Big4</i>	0.398***	0.278***	-0.013	-0.003	0.064**	0.089	-0.133***	0.027	0.120	1.000***

Note: All variables are defined as provided in Table 1, * > 0.1, ** > 0.05 and *** > 0.01, respectively.

Source: Authors' elaboration.

5. DISCUSSION OF RESULTS

5.1. Discussion

Table 5 shows that at the 5% level of significance, the team size of the TM (*SOTM*) is related to business success. In addition, a recent study

indicates that when the management team is larger or more diverse, it becomes easier to disseminate the knowledge and skills of people and allow them to make intelligent decisions that involve more individuals. For example, Alsheikh (2024) indicated that Saudi boards with human and social capital enhance the quality of reports and assist companies

in having a longer life. These findings demonstrate that a combination of various categories of individuals in top positions is desirable. This is logical in Saudi Arabia, where state-owned businesses attempt to form more diversified management groups to achieve the objectives of the contemporary government and the Saudi Vision 2030. Their performance improves because of this.

Researchers have found that having women in TM (*WITM*) significantly hurts a company's performance in a big way. Different studies from other countries have discovered that having women in top roles improves performance by making the government stronger and management more aware of what is best for clients. This outcome seems to contradict these findings. However, there may be specific reasons for this negative effect in Saudi Arabia. Although there are some women in top positions, it can be hard for them to have a direct impact on policy decisions because of problems related to culture and institutions. Additionally, the fact that many businesses do not have any women in places of power may be more of a procedure due to law or social pressures than an actual part of the decision-making process. As a result, there may be a poor relationship between gender and success. This idea is supported by Abadi et al. (2022).

The results showed a positive and significant link at the 1% level when examining the accounting and financial records of TM (*AFATM*). There are benefits to having people with financial knowledge

at work. According to a new study, an accountancy background helps people understand financial rules, openness, and safety standards better. By making things clearer, this stops people from changing their earnings. Charchaafa and Kimouche (2024) discovered that the understanding of Saudi Arabia's top managers of the country's government and finances greatly improved social and financial openness, which in turn led to greater business success.

Additionally, the information showed that CSR methods have a big and positive impact on performance. Recently, Alobaid et al. (2024) studied the Saudi market and found that CSR makes investments more effective. This result is consistent with that of the study. Additionally, Yamani et al.'s (2025) research on the food industry in the United Kingdom supports this idea, showing that CSR is linked to better financial and competitive success for companies. Being responsible for others and the earth is very important in Saudi Arabia as part of Vision 2030. Customers see CSR as a business strategy that helps a company grow in a way that is sustainable in the long term, improves its image, and builds strong relationships with stakeholders. As of now, the study's results could be seen as more proof that the success of Saudi companies depends a lot on their TM teams, including their professional skills and dedication to social duty. However, since women's involvement has a negative impact, more research is required to discover whether this is due to cultural and environmental hurdles or formal organizational practices that prevent women from making choices.

Table 5. Ordinary least squares regression results

Variable	Model 1			Model 2		
	Coef.	T	p > t	Coef.	T	p > t
CSR	0.3009	6.53***	0.000	0.329	3.42***	0.001
SOTM	0.1405	2.03**	0.043	0.126	1.25	0.213
WITM	-0.1117	-3.14***	0.002	-0.050	-0.83	0.408
AFATM	0.2019	3.12***	0.002	0.200	1.94*	0.053
CSR_SOTM	-	-	-	0.003	0.04	0.971
CSR_WITM	-	-	-	-0.063	-1.05	0.295
CSR_AFATM	-	-	-	-0.002	-0.02	0.982
LTA	-0.0015	-0.08	0.940	-0.001	-0.07	0.947
LOSS	-0.0997	-1.82*	0.069	-0.097	-1.77*	0.076
GRTH	0.0031	7.56***	0.000	0.003	6.2***	0.000
LEV	0.1844	1.6*	0.110	0.196	1.66*	0.097
Big4	0.4725	8.56***	0.000	0.472	8.57***	0.000
YRS	Included			Included		
_cons	5.4663	37.53	0.000	5.428	35.8	0.000
Number of obs.	917					
Prob > F	0.0000			0.0000		
R ²	0.2838			0.2855		
Root mean square deviation (MSE)	0.67833			0.679		

Note: All variables are defined as provided in Table 1, * > 0.1, ** > 0.05 and *** > 0.01 respectively.
Source: Authors' elaboration.

5.2. Further investigation

5.2.1. Result using FGLS regression

The FGLS method was used to fix the issues that came up because of the expected heteroskedasticity and autocorrelation factors in the data from a Saudi company. New studies have shown that this method is a good way to get a better idea of how likely something is to happen when there is a lot of complicated financial data. As an example, Hasan

et al.'s (2024) study of financial institutions in Bangladesh using panel data from 2011 to 2022 showed that FGLS was the most accurate way to find out how corporate governance affects performance. FGLS also made it easy to use numbers to see how gender diversity and board size affect progress in Vietnam, among other things (Anh et al., 2024). The study used FGLS regression, which makes the data stronger and more reliable. This is because FGLS regression deals with the fact that company data often has an uneven distribution of variance

and errors that are linked to each other. Some new studies, like Hasan et al. (2024), have shown that FGLS was right about the link between the size of the board and how well financial institutions did. A study by Anh et al. (2024) also found that FGLS was a better way than others to find the links between corporate governance (such as board size and diversity of leadership) and company success. By using a more advanced data analysis method, we can now better understand how the traits of TM, CSR, and the success of Saudi companies are linked.

The FGLS analysis found the same links as the first analysis between the traits of top managers and how well the company performed. Because heteroscedasticity and autocorrelation were considered, the figures are correct. According to the study, the sustainable variable (CSR) had some effect on strengthening the link between the executive board and business success. This means that habits that are good for the environment might help business leaders do a better job of getting things done.

Table 6. Cross-sectional time-series FGLS regression

Variable	Model 1			Model 2		
	Coef.	T	P > t	Coef.	T	P > t
CSR	0.298	7.84***	0.000	0.311	3.98	0.000
SOTM	0.144	2.28**	0.023	0.107	1.02	0.309
WITM	-0.119	-3.93***	0.000	-0.044	-0.77	0.440
AFATM	0.205	3.4***	0.001	0.191	1.91	0.056
CSR_SOTM	-	-	-	0.039	0.46	0.649
CSR_WITM	-	-	-	-0.075	-1.61*	0.108
CSR_AFATM	-	-	-	0.014	0.17	0.862
LTA	-0.001	-0.08	0.938	-0.001	-0.06	0.951
LOSS	-0.109	-1.85*	0.064	-0.105	-1.79*	0.074
GRTH	0.003	1.6*	0.109	0.003	1.6*	0.110
LEVG	0.202	1.85*	0.064	0.219	1.99*	0.046
Biq4	0.462	8.7***	0.000	0.463	8.73***	0.000
YRS	Included			Included		
_cons	5.459	41.93	0.000	5.432	37.56	0.000
Coefficients	Generalized least squares			Generalized least squares		
Panels	Heteroskedastic			Heteroskedastic		
Correlation	No autocorrelation			No autocorrelation		
Number of obs	917			917		
Number of groups	7			7		
Wald chi ² (15)	294.97			298.93		
Prob > chi ²	0.0000			0.0000		

Note: All variables are defined as provided in Table 1, * > 0.1, ** > 0.05 and *** > 0.01, respectively.

Source: Authors' elaboration.

5.2.2. Result using 2SLS

2SLS was used to deal with the chance of endogeneity, which means that mistakes are connected to the separate factors. In some cases, this can lead to less accurate standard regression numbers. These methods help us understand things like the size of TM, the number of women in TM, and the accounting and financial background of TM members. These variables may be connected to things that we cannot see, but that affect how well the company does its job. The 2SLS data showed that the links between the traits of top managers and how well a company does are the same as those found in the first study (OLS/FGLS). Such modifications render the data more concrete and indicate that they reveal a direct relationship rather than just an association. According to Hasan et al. (2024), the top managers had an influence on the performance of the company depending on the size of the team. This demonstrates that more experienced management teams and people of different types are able to make superior decisions on the strategy. Chaabouni et al. (2025) wrote that

increasing the percentage of women in TM is a bad idea in business. In the meantime, given how things are established in Saudi Arabia, there might be difficulties with providing women with leading jobs due to the traditions of the country and the organization of the working process. According to Charchaafa and Kimouche (2024), the accounting and finance abilities of the top managers also had a significant and positive influence. This demonstrates the significance of being aware of money to be more transparent and keep a watch on what you spend. In addition, the connection between the success of the company and the board of directors was enhanced by its practices in the area of CSR. It implies that the influence of leadership on performance is even greater with the introduction of sustainability practices (Alobaid et al., 2024). The 2SLS results support the idea that the qualities of top managers and social responsibility practices play a big role in determining how well Saudi companies do. Anh et al. (2024) also say that these methods make the research more reliable because they give more accurate predictions than older ones.

Table 7. Instrumental variables (2SLS) regression

Variable	Model 1			Model 2		
	Coef.	z	Coef.	Z	Coef.	z
CSR	0.299	7.57***	0.000	0.329	4.03	0.000
SOTM	0.128	1.95**	0.051	0.126	1.17	0.244
WITM	-0.113	-3.57***	0.000	-0.050	-0.86	0.391
AFATM	0.198	3.16***	0.002	0.200	1.96	0.050
CSR_SOTM	-	-	-	0.003	0.04	0.969
CSR_WITM	-	-	-	-0.063	-1.3	0.193
CSR_AFATM	-	-	-	-0.002	-0.03	0.980
LTA	-0.001	-0.09	0.925	-0.001	-0.08	0.934
LOSS	-0.100	-1.65*	0.099	-0.097	-1.6	0.109
GRTH	0.003	1.93*	0.054	0.003	1.88	0.060
LEVG	0.184	1.63*	0.103	0.196	1.73	0.084
Big4	0.472	8.64***	0.000	0.472	8.64	0.000
YRS	Included			Included		
_cons	5.466	40.74	0.000	5.428	36.66	0.000
Wald chi ² (9)	276.13			278.49		
Number of obs.	917			917		
Prob > F	0.000			0.000		
R ²	0.284			0.286		
Root MSE	0.671			0.6697		

Note: All variables are defined as provided in Table 1, * > 0.1, ** > 0.05 and *** > 0.01, respectively.

Source: Authors' elaboration.

6. CONCLUSION

This study investigates the impact of TM features, such as team size, proportion of women, and accounting and finance experience, along with CSR practices, on the performance of Saudi listed firms. The study has strong evidence of association and causality using panel data comprising 131 firms and 917 firm-year observations between 2015 and 2021 using the OLS, FGLS, and 2SLS models.

The results show that executive team quality plays an important role in firm performance. TM size and accounting and financial capabilities are positively correlated with performance, which underscores the issue of financial competence and strategic capacity at the top levels of the organization. CSR practices also have a partially positive contribution, implying that sustainability engagement enhances executive governance performance and improves firm outcomes. However, the growth of female representation in TM was found to be unfavorable to the performance of the companies within the study period. This finding might indicate contextual cultural, institutional, or structural limitations that inhibit the successful incorporation of women into executive decision-making, and not necessarily the presence of different levels of performance.

The present research is significant for future studies in that it provides causal evidence of an emerging market facing changes in regulation and governance. Future studies can further this research by applying it to private companies, international comparisons, or post-reform evidence

to determine whether these relationships depend on institutional changes. Other factors, including organizational culture, innovation intensity, leadership style, and ESG disclosure quality, may also contribute to the association between executive traits and firm success. Longitudinal and flexible methodological designs can also be more insightful concerning gender interactions and CSR implementation in executive frameworks.

In the policy and governance aspect, the results indicate that financial expertise in the executive groups contributes to the performance of firms. Nevertheless, the initiatives of diversity should be supported by institutional resources, leadership development programs, and governance reforms so as to achieve effective inclusion. Another way regulators can improve the CSR disclosure frameworks is by strengthening the strategic coherence between sustainability and corporate performance. Although it has its contribution, the study has limitations. The sample will only be limited to publicly listed Saudi companies, and this can limit generalization. The dependence on second-hand quantitative data restricts the ability of understanding behavioral and qualitative dynamics. In spite of the use of advanced econometric techniques, there are still chances that the results are subject to influence by some unobserved factors. Comprehensively, the current research has added to the corporate governance and sustainability literature by presenting a methodologically sound and context-guided evidence on how the executive personality and CSR practices influence the performance of firms in an emergent market context.

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