

Statistical Analysis to Moderating Role of Family Ownership in the relation between ESG Disclosure and Financial Performance: Evidence from Saudi Market

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Abstract: This study investigates the moderating role of family ownership in the relationship between Environmental, Social, and Governance (ESG) disclosure and financial performance (FP) among publicly listed firms in Saudi Arabia. Using a sample of 500 firm-year observations between 2019 and 2023, the findings reveal that ESG disclosure significantly enhances FP, particularly when all three dimensions (E, S, and G) are integrated into a composite index. Also, family ownership demonstrates a positive, though moderate, and directs effect on FP. Most importantly, the interaction between family ownership and ESG disclosure shows a strong moderating effect, indicating that family-controlled firms benefit more from ESG practices in terms of financial outcomes. The study contributes to the literature by highlighting ownership structure as a key contextual factor and recommends enhancing ESG disclosure frameworks.

Keywords: Family Ownership - ESG Disclosure - Financial Performance.

1. Introduction

The trajectory of corporate financial performance (FP) in the 2020s has been shaped by extraordinary global events and structural shifts, hence Environmental, social, and governance (ESG) criteria have become increasingly central in corporate strategy and investment research since 2020. According stakeholder theory the firms demonstrating strong ESG commitments enjoy greater investor trust, improved risk management, and enhanced operational efficiency, all of which translate into better financial performance By integrating global sustainability standards, that transparent ESG practices can yield tangible financial benefits in emerging markets [1]. A broad consensus[2] is emerging that strong ESG performance often correlates with better long-term financial performance, found a robust positive association between companies' ESG ratings and their financial results, firms with higher ESG scores tended to exhibit superior profitability and stock returns .Hence , integration of (ESG) disclosure into corporate reporting has become increasingly imperative for firms operating in emerging markets, particularly within the framework of Saudi Arabia's Vision 2030, which emphasizes transparency, sustainability, and long-term value creation [3].

Recent systematic literature[4] [5] [6] [7] the methodological emphasis on FP and disclosure practices, but cautions that conventional ratio-based comparisons between family and non-family firms often rest on fragile assumptions regarding data distribution and composition, its finds that ESG participation is significantly and positively associated with accounting profitability (ROA) across all dimensions. Similarly, research on family firms globally reveals that ESG performance positively relates to firm value but the impact is dampened by financial constraints and agency costs, particularly governance issues in family-controlled contexts[8]. Also, [9]suggesting governance maturity and generational shifts improve accounting-based ESG engagement over time. Some, studies have scrutinized how ESG and ownership structure jointly influence measurable performance outcomes in financial statements. [5] found that ownership structure significantly improves (ROA), and that ESG scores moderate this relationship positively. Meanwhile, [4, 10] assessment highlights that ownership (including family versus institutional) exerts a systematic influence on ESG disclosure practices, thereby indirectly affecting observed financial ratios and value measures, and accounting researchers caution that heterogeneity in ESG measurement and reporting must be taken into account when interpreting financial performance links. Conversely, according to [11] some family firms reap longer-term gains from ESG that are not immediately reflected in market value, pointing to a timing difference.

Although prior accounting-based research in Saudi Arabia has documented a generally positive association between ESG disclosure and profitability metrics [12] and found ESG disclosures to influence performance measures such as ROA, ROE, and Tobin's Q, these studies overlook the potential moderating effect of family control. Also, family ownership in Saudi-

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listed firms has been shown to negatively influence overall performance [13], yet may also indirectly shape ESG disclosure practices and their financial impact through socio emotional wealth preferences and governance conservatism [14]. The investigation into how family ownership moderates the ESG disclosure and FP relationship in Saudi Arabia addresses a crucial gap in accounting research and practice. First, until recently the country's sustainability and governance practices were in their infancy, with Saudi firms ranking relatively low on global sustainability indices and CSR reporting largely being quantity focused rather than quality driven, this setting gives family owners outsized influence on strategic priorities, including whether to pursue ESG initiatives [15]. Second, family controlled firms remain dominant in Saudi corporate ownership where Founding families hold controlling stakes in roughly 70% of publicly listed Saudi firms, often occupying key board and management positions, widely documented to influence ESG practices in unique ways which plays a critical role in moderating ESG and performance dynamics [14, 15]. Third, empirical evidence shows a positive association between ESG disclosure and accounting based performance including ROA, ROE, and Tobin's Q among Saudi firms [1]. Fourth, broader GCC-focused accounting research reveals that private family control is negatively associated with ESG performance [9].

While the broader link between ESG disclosure and FP has been examined globally, there is a notable dearth of accounting literature that critically explores how family ownership may alter or condition that relationship in the Saudi context a market characterized by high levels of family and state ownership and evolving disclosure standards [13]. Hence, understanding this moderating role in Saudi Arabia is crucial, given the dominance of family controlled firms, as it suggests that simply adopting ESG practices may yield varying performance outcomes contingent on a company's ownership structure. Collectively, literature review accounting findings demonstrate that family ownership exerts a significant conditional effect on ESG disclosure and FP, its unexamined directly within the Saudi context, underlining the study's theoretical and practical importance for policymakers, investors, and corporate governance reformers. Based on this current study seek to measurement the mathematical models to examine the effect of family ownership on relation between ESG and FP. Therefore, the remainder of the study is organized as follows; second part deals with the theoretical background and hypotheses development, third part an applied study methodology, while the fourth part deals with the statistical hypotheses analysis, finally the study concludes with results and recommendations.

2. Background & Hypothesis Development

2.1 ESG and Financial Performance

The recent surge in scholarly interest around ESG disclosure and its impact on (FP) is well reflected in growing systematic review literature. Following [16] a statistically significant positive correlation between ESG disclosure and firms' economic performance based on accounting and market-based measures. Where [17] reveal that higher ESG disclosure scores significantly enhance ROA, ROE, and market valuation, especially for larger firms, while high leverage attenuates the benefit. Moreover, evidence from Chinese-listed firms in high-environmental-impact sectors shows that implementation of formal ESG systems significantly raises profitability (ROA and ROE), suggesting that not just disclosure, but systemic ESG integration matters [18]. Similar [19] indicate a strong positive and significant relationship between ESG transparency and CFP measures. Also, [20] observes that ESG disclosure tends to be associated with more favourable performance outcomes, especially when transparency and material relevance are high. Also, [21] examining the impact of overall vs. individual ESG pillar disclosure finds that while aggregate ESG disclosure contributes positively to competitive advantage and firm value, individual E, S, or G components may show varying significance depending on firm context [22].

In contrast, [23] Highlights that ESG disclosure alone may exert negative effects on ROA and ROE, especially when disclosure transparency is poor; over-disclosure or potential green washing seems to reduce financial benefits in these sectors. This aligns with [20] that emphasizes measurement heterogeneity and methodological variation across ESG FP studies, calling for improved standardization in empirical designs and reporting indicators. Another study [24] showed that ESG disclosure generally exhibits a low positive correlation with FP. Furthermore [18] illustrate in China's environmentally intensive industries, implementation of formal ESG systems consistently leads to notable enhancements in financial performance, including improved profitability and operational efficiency, demonstrating that systemic integration beyond disclosure is a powerful driver of financial results.

In the Saudi context, [12] explores ESG disclosure's impact on FP among Saudi firms, It finds a significantly positive effect of ESG disclosure on ROA, indicating that transparent ESG reporting correlates with stronger profits in emerging-market contexts. Furthermore [1] analyzed panel data from 2017–2022 on 100 Saudi firms to examine how ESG disclosure affects FP, found that higher ESG disclosure is significantly associated with higher (ROA), (ROE), and Tobin's Q (market valuation). Also, [22] provided further evidence that ESG reporting and FP go hand in hand in listed Saudi firms from 2020–2022, study found that firms with more comprehensive ESG disclosures achieved better financial efficiency across multiple indicators, including ROA, ROE, and ROI. Also [1] emphasizes the dual role of ESG practices not only do they drive FP

improvements, but they also promote long-term sustainability and development goals. These results led to calls for unified, standardized ESG disclosure guidelines in Saudi Arabia's capital market, as consistent reporting can enhance the credibility and comparability of ESG information, thereby helping investors recognize the financial value of sustainability initiatives.

In these line [25] found that overall ESG disclosure was not universally beneficial across all measures, while it had no significant effect on profitability (ROE), a higher aggregate ESG score was associated with a lower Tobin's Q, suggesting the market valuation of Saudi firms could be dampened by broad ESG efforts in that period. However, the impact varied by ESG component. Also [14] findings suggest that good governance can reinforce the financial benefits of ESG initiatives, as boards help ensure that sustainability efforts are strategically aligned with value creation in the Saudi context. This evidence from the Saudi market underscores that robust ESG disclosure can coincide with better financial metrics, particularly in sectors where sustainability initiatives are more readily integrated into business strategy. Thus, we formulate our hypotheses as follows:

H₁ : There is significant effect to ESG disclosure on financial performance

2.2 Effect of family ownership on financial performance

Family structure plays a critical role in shaping the financial performance of family-owned firms, particularly through its influence on governance and control mechanisms. Conversely, study [26] indicate that family firms maintain lower leverage and produce higher ROA and ROE compared to non-family peers, highlighting how conservative capital structure aligned with cohesive family ownership reinforces both accounting stability and earnings performance. Empirical accounting research [27] demonstrates that firms with cohesive family structures often benefit from aligned incentives, long-term orientation, and tighter monitoring, which can enhance (ROA) and (ROE). Analyzing [28] South African listed firms (2015-2019), finds that family firms have significant links with financial performance. Moreover, [6] suggests that accounting practices differ systematically across family ownership particularly concerning disclosure, earnings management, and accrual choices and these differences shape measurable accounting quality and firm resilience.

Similarly, [29] shows that ownership concentration, where families maintain controlling stakes, significantly enhances firm value and profitability, supporting the notion that ownership structure aligned with family authority fosters financial performance. Evidence from emerging markets further confirms that family ownership structure variations affect accounting outcomes, [30] shows that block family ownership significantly impacts gross profit margin and overall financial performance, with structured family control leading to more disciplined financial ratios and sustainable profitability. However, family ownership often introduces internal conflicts and power struggles, which can negatively affect firm performance. Accounting studies [31, 32] have shown that when ownership is dispersed among extended family members without a unified governance framework, firms may suffer from inefficient capital allocation, lower earnings quality, and increased earnings management practices. These governance frictions often manifest in lower profit margins and weaker stock market valuations. Thus, while the simplicity of control in single-leader firms may yield short-term performance gains, it can also increase long-term financial risk if not balanced with professionalized oversight. The relationship between family ownership and FP of Saudi firms is complex and the evidence is mixed, so the current study assumes:

H₂: There is significant effect to family ownership on financial performance

2.3 Effect of family ownership on ESG and financial performance

Relevant theories offer differing predictions about family owners' impact, Socio emotional wealth (SEW) theory argues that family controlled firms place great importance on non-financial goals like preserving family legacy, reputation, and long-term success. So (SEW) considerations could motivate more engagement in ESG practices to protect the family name and ensure longevity, hence, supporting community projects or robust governance as a means to enhance the firm's image and social legitimacy [15]. Some studies [15, 33, 34] highlight a positive role of family involvement, especially when families leverage ESG strategically to protect and grow their socio emotional wealth. For instance, research in another emerging economy [33] found that greater family member participation in management led to higher CSR performance, supporting the idea that family firms use CSR as a deliberate long-term strategy. Also, during the COVID-19 pandemic, family firms with higher ESG scores did not experience the decline in value seen in others, indicating that investors view strong ESG performance as a sign of future financial strength [28].

Several studies have tested whether family ownership alters the relationship between a firm's ESG disclosure and its financial performance, Evidence suggests that family involvement can amplify the positive impact of ESG initiatives. Where, [35] this broad evidence suggests that integrating ESG considerations can align with shareholder value creation worldwide. Also [36] found that greater family participation (in ownership, management, and board control) strengthened the CSR financial performance, hence this positive moderation implies that family businesses may leverage ESG activities more effectively to boost firm value in certain contexts research, also [37] indicated to firms build trust, reputation, and long-term from ESG support ultimately improve their economic results and enhance financial performance. Furthermore [38] study on corporate

board diversity and sustainability found that strong family shareholdings helped neutralize potential downsides of diverse boards on long-term FP in Saudi Arabian .Here, family oversight acted as a stabilizing force, ensuring that governance and ESG changes translated into sustained financial health. On a broader scale, that family firms with high ESG scores achieved significantly better financial results, suggesting ESG investments were especially valuable for family-run companies

In the other hand agency theory, provides a cautionary counterpoint with concentrated family control, the risk arises that controlling families prioritize their own interests (continuity, control, or private benefits) at the expense of outside stakeholders. In this view, some family firms might neglect or under-invest in ESG if such initiatives are seen as diverting resources or empowering non-family stakeholders [15, 33]. Thus, some studies show that family control can impede CSR and sustainability performance, largely due to agency conflicts or entrenchment. A notable multi country analysis [39] showed that family-controlled firms exhibited significantly lower CSR performance than non-family firms. Because controlling family shareholders may shirk broader social responsibilities and underinvest in CSR in order to maximize their private benefits or avoid spending on activities with diffuse benefit side as. A study[40] reported that while CSR efforts generally improved financial performance, the interaction term with family ownership was negative and significant ideas. In those firms, high family ownership actually dampened the positive effect of CSR on profitability ideas. Furthermore [25] study on Saudi listed companies found that overall ESG disclosure was associated with a decrease in market valuation (lower Tobin’s Q), and it showed no significant link with accounting profitability. These theoretical perspectives[15, 33] suggest that family ownership in Saudi Arabia can be a double edged sword either enhancing ESG engagement through long-term stewardship values or constraining it due to self-interested control, depending on the family’s goals and governance ethos. For example, research on sustainable firms in an emerging market found that while ESG performance has a positive direct effect on firm value, the presence of significant family ownership alters this effect[11].

In practical terms, even though ESG initiatives generally boosted firm valuation, firms with higher family shareholding saw a diminished benefit suggesting that family influence may temper investor confidence or the efficiency of ESG investments. Given the above, family ownership is increasingly seen as a moderating factor in the ESG financial performance link, hence the effect that ESG practices have on a firm’s performance may differ depending on the family involvement, where recent studies provided examining this moderating role provide insight into its complexity, so the current study assumes:

H3: There is significant effect to family ownership on relation between ESG and financial performance

3. Research Design

3.1 Sample & Variables Measurement

This study aims to assess the influence of family ownership on relationship between ESG and financial performance in publicly listed firms in Saudi Arabia, where the data were obtained from the Mubasher database, utilized by academics, professionals, and practitioners worldwide, encompassing information on family ownership, ESG, FP, and other financial variables collected during a five-year span from 2019 to 2023. The sample consisted of 500 observations from 100 organizations; also, the study methodology employed contemporary statistical techniques (SPSS 26 & Smart PLS 4), furthermore measurement instruments can be categorized as follows in table (1):

Table 1: Variable definitions

Type	Variables	Measurements	References
Independent Variable	ESG	ESG for selected companies, varying from 0% (no disclosure) to 100% (complete disclosure), according to Bloomberg’s weighted scoring methodology.	[14]
Dependent Variable	Financial performance (FP)	Return on assets determined by dividing the firm's net profit at year's end by its average total assets at the beginning and end of the year.	[41]
Moderator variable	Family Ownership (Fam owner)	Enterprise family ownership %	[42]
Control Variables	Board size(SIZE)	Natural log of the firm’s total assets.	[14]
	Firm age	Natural logarithm of firm incorporation year.	
	company’s leverage(Lev)	The firm’s total interest-bearing debt divided by its total assets.	
	LOSS	When a corporation has negative earnings, 1; otherwise, 0.	
	Growth	Change in net revenues from the prior year.	

3.2 Research Models

Research methods for analyzing the effect of family ownership on the relationship between ESG disclosure and financial performance are shown in (Table 2), where model (1) examines the direct relationship between ESG disclosure and financial performance, taking into account age, LEV, loss, and growth. Also, the relationship between family ownership and ESG is depicted in model (2). Additionally, by incorporating interaction variables between ESG and this family ownership, model (3) investigate the moderating influence of family ownership on the relation between ESG disclosure and FP.

Table 2: Research Models

<i>The models (1-4) to test the Effect of ESG score Disclosure on FP</i>	
$FP = \alpha + \beta_1 \text{ ESG} + \beta_2 \text{ SIZE} + \beta_3 \text{ Age} + \beta_4 \text{ LEV} + \beta_5 \text{ Loss} + \beta_6 \text{ Growth} + \epsilon$	(1)
$FP = \alpha + \beta_1 \text{ E} + \beta_2 \text{ SIZE} + \beta_3 \text{ Age} + \beta_4 \text{ LEV} + \beta_5 \text{ Loss} + \beta_6 \text{ Growth} + \epsilon$	(2)
$FP = \alpha + \beta_1 \text{ S} + \beta_2 \text{ SIZE} + \beta_3 \text{ Age} + \beta_4 \text{ LEV} + \beta_5 \text{ Loss} + \beta_6 \text{ Growth} + \epsilon$	(3)
$FP = \alpha + \beta_1 \text{ G} + \beta_2 \text{ SIZE} + \beta_3 \text{ Age} + \beta_4 \text{ LEV} + \beta_5 \text{ Loss} + \beta_6 \text{ Growth} + \epsilon$	(4)
<i>The fifth model to test the Effect of family ownership on FP</i>	
$FP = \alpha + \beta_1 \text{ Fam Own} + \beta_2 \text{ SIZE} + \beta_3 \text{ Age} + \beta_4 \text{ LEV} + \beta_5 \text{ Loss} + \beta_6 \text{ Growth} + \epsilon$	(5)
<i>The models(6-9) to test the Moderating Role of family Ownership in the relation between ESG disclosure and FP</i>	
$FP = \alpha + \beta_1 \text{ ESG} + \beta_2 \text{ Fam_Own} + \beta_3 \text{ ESG* Fam_Own} + \beta_4 \text{ SIZE} + \beta_5 \text{ Age} + \beta_6 \text{ LEV} + \beta_7 \text{ Loss} + \beta_8 \text{ Growth} + \epsilon$	(6)
$FP = \alpha + \beta_1 \text{ E} + \beta_2 \text{ Fam_Own} + \beta_3 \text{ ESG* Fam_Own} + \beta_4 \text{ SIZE} + \beta_5 \text{ Age} + \beta_6 \text{ LEV} + \beta_7 \text{ Loss} + \beta_8 \text{ Growth} + \epsilon$	(7)
$FP = \alpha + \beta_1 \text{ S} + \beta_2 \text{ Fam_Own} + \beta_3 \text{ ESG* Fam_Own} + \beta_4 \text{ SIZE} + \beta_5 \text{ Age} + \beta_6 \text{ LEV} + \beta_7 \text{ Loss} + \beta_8 \text{ Growth} + \epsilon$	(8)
$FP = \alpha + \beta_1 \text{ G} + \beta_2 \text{ Fam_Own} + \beta_3 \text{ ESG* Fam_Own} + \beta_4 \text{ SIZE} + \beta_5 \text{ Age} + \beta_6 \text{ LEV} + \beta_7 \text{ Loss} + \beta_8 \text{ Growth} + \epsilon$	(9)

4. Data analysis & Results

4.1: Descriptive statistics

Table (3) presents descriptive statistics for a sample of 500 firms, aiming to analyse the relationship between ESG, family ownership and financial performance, The data show that mean Environmental (E), Social (S), and Governance (G) indicators ranged between 48 and 48.7, indicating a moderate level of performance in terms of sustainability practices, with relative variance across Saudi firms as reflected in the standard deviation values. The overall average of the Composite ESG Index was 48.41, reflecting a general balance in the orientation toward (ESG). Regarding ownership structure, the mean of family ownership was 40.41%, confirming the significant relative weight of this type of ownership in the Saudi market and reinforcing the importance of examining its impact on financial performance. Furthermore, the financial performance of firms is reflected through the FP variable, with mean of 0.518, while the Earnings Per Share (EPS) variable achieved mean of 4.96, reflecting significant variation in profitability across firms. These results reflect the wide diversity of characteristics of Saudi firms, providing a robust database that allows advanced statistical analyses to test hypotheses related to the impact of family ownership and ESG on FP.

Table 3: Descriptive Statistics

	N	Mini	Max	Mean	Std. Deviation
E	500	30.1	70.2	48	7.39
S	500	30.9	69.35	48.3	7.41
G	500	30.7	70.1	48.7061	7.28571
ESG	500	31.46	67.35	48.4106	6.15427
Family Ownership	500	7.520	71.725	40.411	9.745
FP	500	.125	.924	.518	.1497
Size	500	8.602	11.447	9.969	.497
Age	500	.0812	1.904	1.015	.308
LEV	500	.1009	.8993	.493	.2264
LOSS	500	0	1	.19	.396
EPS	500	3.503	6.4956	4.9582	.8599
Valid N (listwise)	500				

4.2: Correlation Analysis

The correlation (Table.4) shows that (FP) is statistically significantly positively correlated with several key independent variables, there are strong positive correlations between FP and each of the (E), (S), and (G) dimensions, with coefficients of 0.809, 0.796, and 0.765, respectively (sig , 0.01). The ESG composite index, which combines (ESG) dimensions, also has a high positive correlation with the company's FP (0.945, sig, 0.01). It is also family ownership is positively and significantly correlated with FP, with a correlation coefficient of (0.337; sig, 0.01). These results indicate that higher levels of these variables (high ESG scores and high family ownership) are associated with better FP.

Table 4: Correlations

	E	S	G	ESG	Fam Owner	FP	Size	Age	LEV	LOSS	EPS
E	1										
S	.540**	1									
G	.521**	.581**	1								
ESG	.823**	.847**	.837**	1							
Fam Owner	.099*	.097*	.075	.108*	1						
FP	.809**	.796**	.765**	.945**	.337**	1					
Size	.022	.017-	.025-	.008-	.020	.030	1				
Age	.025	.023	.063	.044	.002-	.044	.043-	1			
LEV	.067	.047	.024	.055	.017	.048	.040	.021	1		
LOSS	.050-	.020-	.059-	.051-	.058	.079-	.011-	.054-	.008-	1	
EPS	.051-	.076-	.002	.050-	.045	.038-	.043	.033	.081	.060-	1

** . 0.01 , * . 0.05

4.3 Data Validity Test

Table (5) shows the results of the multicollinearity analysis using the Tolerance and VIF indices for the study models, with the aim of verifying the independence of the variables. The results showed that all Tolerance values exceeded the minimum statistically acceptable limit (0.10), and all VIF values were less than the critical limit (10), which indicates that there is no multicollinearity problem between the variables entered into the models.

Table 5: Collinearity Statistics

	(1)		(2)		(3)		(4)		(5)	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
E	.987	1.014								
S			.990	1.010						
G					.992	1.008				
ESG							.989	1.011		
Fam Owner									.988	1.012
Firm Size	.982	1.018	.982	1.018	.982	1.019	.982	1.018	.982	1.018
Firm Age	.991	1.009	.991	1.009	.988	1.012	.990	1.010	.991	1.009
LEV	.987	1.014	.988	1.012	.991	1.009	.988	1.012	.991	1.009
LOSS	.979	1.021	.982	1.019	.979	1.021	.979	1.021	.980	1.021
EPS	.984	1.016	.981	1.019	.987	1.013	.984	1.016	.985	1.015

a. Dependent Variable: FP

Also, (Table.6) indicted normal distribution test table indicates that the FP variable follows a normal distribution, based on the results of both the Kolmogorov-Smirnov test (Sig. = 0.200) and the Shapiro-Wilk test (Sig. = 0.291). The statistical significance values in both tests were higher than the 0.05 significance level, which means data is normal distribution hypothesis.

Table 6: Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
FP	.027	500	.200*	.996	500	.291

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

The histogram shows in figure (1) the distribution of the standardized residuals of the regression associated with the dependent variable FP, and indicates that these residuals approximately follow a normal distribution.

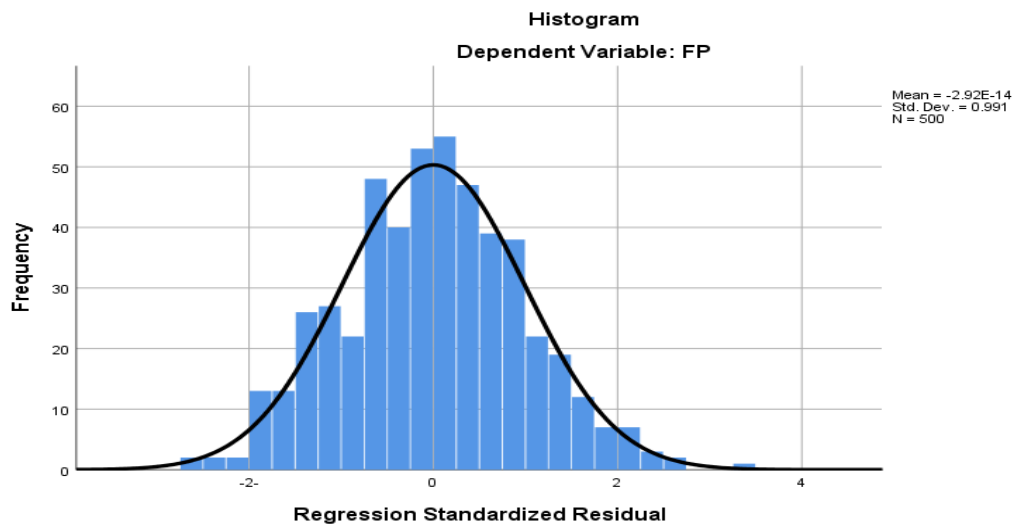


Fig. 1: Standardized Residuals

The scatterplot illustrates the relationship between the standardized predicted values and the standardized residuals of the FP variable, this plot is used to test the homoscedasticity hypothesis, hence figure(2) demonstrates the validity of the regression model used and confirms that it meets the homoscedasticity hypothesis, which is one of the basic assumptions in regression analysis.

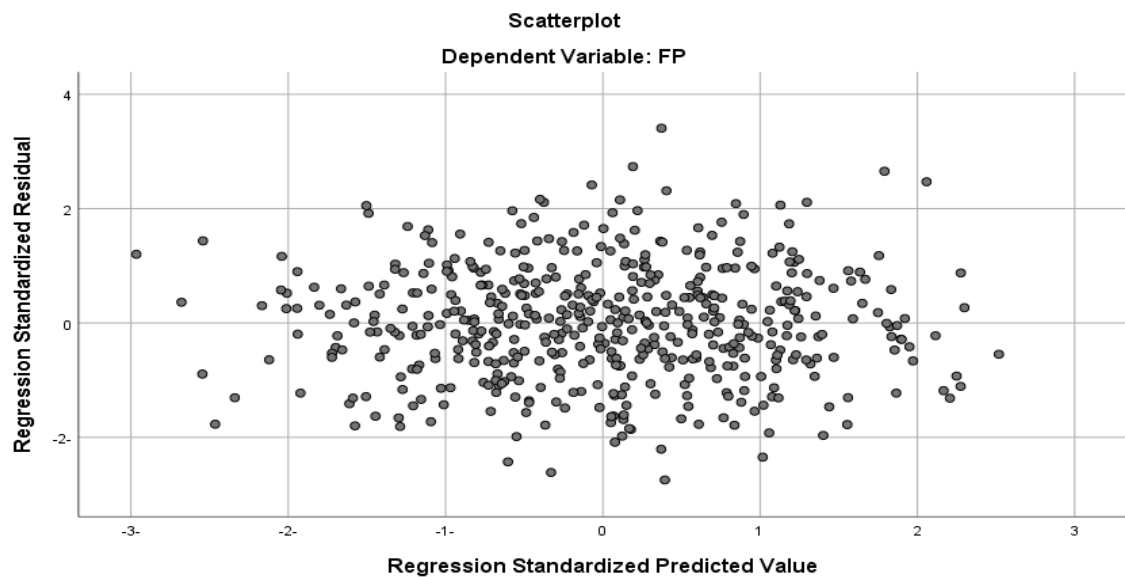


Fig. 2: Standardized Predicted Values

4.4 Hypotheses Test Results

1. Testing the effect of ESG disclosure on FP

Table (7) , show the results of regression analysis showed that sustainability dimensions of (E), (S), and (G) had significant and direct effects on the dependent variable(financial performance), where all models demonstrated statistical significance at the 0.000 significance level, and adjusted R² values indicated strong explanatory power(65.2% for (E), 63.7% for (S), and 58.8% (G). in addition to, when the three dimensions were combined within the ESG index, the model's explanatory power increased to 89.6%.Hence, integration of environmental, social, and governance dimensions has a stronger impact on dependent variable than the impact of each dimension individually, which underscores the importance of adopting a comprehensive approach to implementing sustainability practices within Saudi firms, Confirm these results with studies[12, 22] [1] .

Table 7: Testing results the effect of ESG disclosure on FP

Model	Variables	R	Adjusted R2	F	Sig.	Durbin-Watson	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
							B	Std. Error	Beta		
1	(Constant)	.811 ^a	.652	134.630	.000 ^b	2.006	.313	.087		3.603	.000
	E						.016	.001	.807	30.342	.000
2	(Constant)	.802 ^a	.637	126.334	.000 ^b	2.035	.407	.090		4.530	.000
	S						.016	.001	.796	29.384	.000
3	(Constant)	.771 ^a	.588	102.726	.000 ^b	1.914	.357	.096		3.734	.000
	G						.016	.001	.764	26.470	.000
4	(Constant)	.947 ^a	.896	613.505	.000 ^b	1.910	.706	.049		14.422	.000
	ESG						.023	.000	.944	64.975	.000

a. Dependent Variable: FP

To support the results by using SmartPLS, (Fig. 3) shows a path map of the relationship between ESG and FP variables, showing the direct effects of E, S, and G, in addition to the compound effect of the ESG on FP, which reached an effect strength of (0.945), reflecting the pivotal role of these practices in enhancing the FP of Saudi firms. Hence, it proves the hypothesis of a significant effect of ESG on FP.

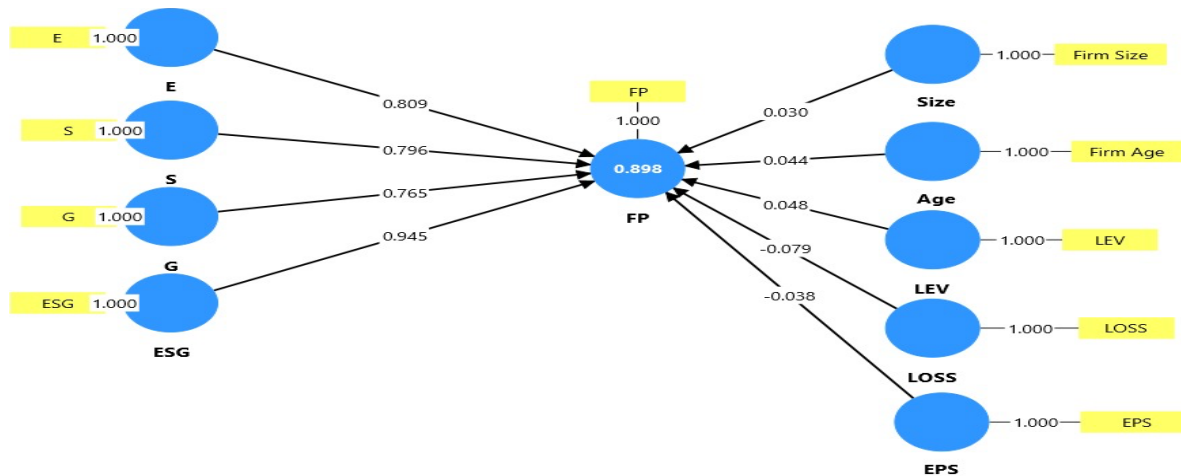


Fig. 3: Path map of the relationship between ESG and FP

2. Testing the effect of family ownership on FP

Table(8) , show the results of the regression analysis showed a statistically significant relationship between family ownership and FP, with R (0.363), indicating a moderately strong relationship, while the adjusted R² value was 0.120, meaning that family ownership explains only 12% of the variance in FP. Also, model (5) showed statistical significance at the 0.000 significance level, indicating the significance of the model as a whole. Furthermore, (Beta = 0.344), indicating a moderate positive effect of family ownership, supported by a T value of 8.133. The results of the current study are consistent with[6, 27, 28] , this suggests that having family ownership in the organizational structure may positively influence changes in financial performance (FP).

Table 8: Testing results the effect of family ownership on FP

Model	Variables	R	Adjusted R2	F	Sig.	Durbin-Watson	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
							B	Std. Error	Beta		
5	(Constant)	.363 ^a	.120	10.679	.000 ^b	2.070	.000	1.929		.135	.259
	Family Ownership						.000	8.133	.344	.001	.005

a. Dependent Variable: FP

To support the results, (Fig .4) presents a path diagram designed using SmartPLS4, which shows that family ownership positively affects financial performance by a factor of (0.337), which supports the hypothesis that ownership pattern can play a role in enhancing financial performance.

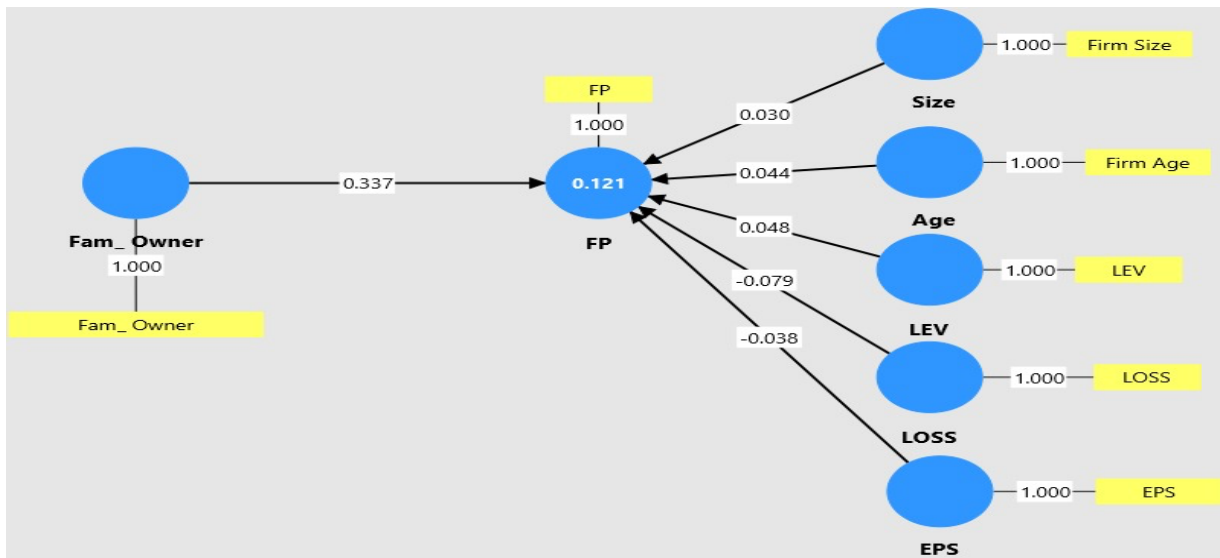


Fig. 4: path map of the relationship between Fam_Owner and FP

3. Testing the effect of family ownership relation between ESG & FP

Table (9) shows the results of the analysis of the interaction between ESG sustainability dimensions and family ownership on FP, where models (6, 7, and 8) represent the interaction of each dimension with family ownership and show high correlation coefficient values ranging from 0.823 to 0.853, with adjusted R² values of 0.723, 0.707, and 0.671, respectively, indicating a clear improvement in explaining variance compared to the separate dimension models. Also (Beta), for the interaction between E and G with family ownership, they were also statistically significant (0.049 and 0.062, respectively), while the interaction between S and family ownership appeared to have a less significant effect (Beta = 0.037). It is worth noting that the model (9), which combined all dimensions into a unified interaction, demonstrated the highest explanatory power, with an R = 0.976 and R² = 0.952, with a very high significance level (Sig. = 0.000). These results reflect that the impact of ESG practices on FP becomes stronger and more effective when combined with family ownership [15, 33, 34], thus, supporting the hypothesis that family ownership may enhance the impact of ESG disclosure on (FP).

Table 9: Testing results the effect of family ownership relation between ESG &FP

Model	Variables	R	Adjusted R2	F	Sig.	Durbin-Watson	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
							B	Std. Error	Beta		
6	(Constant)	.853 ^a	.723	145.673	.000 ^b	2.017	.428	.078		5.461	.000
	E* Fam_Owner						.007	.003	.049	2.046	.041
7	(Constant)	.844 ^a	.707	134.600	.000 ^b	2.031	.509	.082		6.240	.000
	S * Fam_Owner						.006	.004	.037	1.499	.000
8	(Constant)	.823 ^a	.671	114.103	.000 ^b	1.922	.474	.086		5.500	.000
	G * Fam_Owner						.009	.004	.062	2.399	.017
9	(Constant)	976 ^a	.952	1107.758	.000 ^b	1.839	.799	.033		23.922	.000
	ESG * Fam_Owner						1.807	.001	.000	.013	.000

a. Dependent Variable: FP

To support these findings, Figure (5) displays a path map created using SmartPLS, showing the relationships between ESG components, family ownership, and financial performance. The figure shows that E, S, and G had a direct and positive impact

on FP. Also, the impact of family ownership on these relationships is also demonstrated through the moderation paths linking Fam_Owner to each of the ESG components, supporting the hypothesis that family ownership patterns may strengthen or weaken the relationship between ESG and FP.

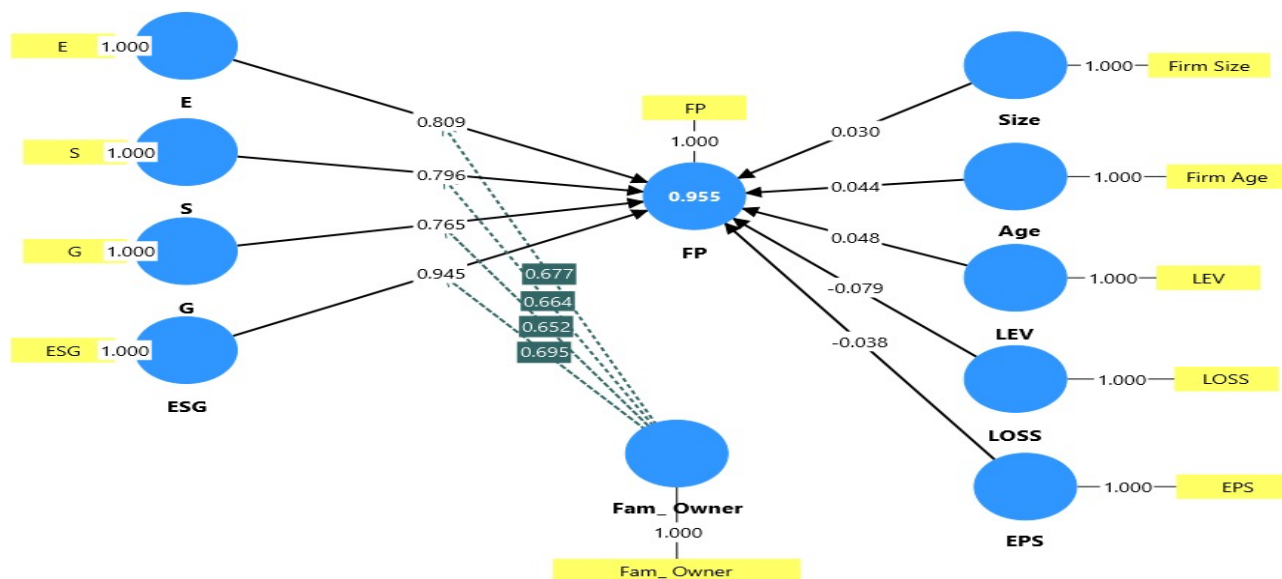


Fig. 5: path map of the relationship Fam_Owner , ESG, FP

5. Results & recommendations

This study aims to investigate moderating role of family ownership in relationship between Environmental, Social, and Governance (ESG) disclosure and financial performance (FP) among listed firms in Saudi Arabia, in light of the country's increasing emphasis on transparency and sustainability under Vision 2030, current study addresses a critical gap in the literature by exploring how family-controlled ownership structures interact with ESG initiatives to effect on FP, hence to achieve the study objective utilizes a sample of 500 firm-year observations covering the period from 2019 to 2023, with ESG data sourced using Bloomberg's scoring methodology and financial performance measured by Return on Assets (ROA). The empirical analysis is conducted using advanced statistical techniques including SPSS and SmartPLS.

The study's results provide strong evidence that ESG disclosure has a significant and positive effect on financial performance, where regression models revealed that while each ESG dimension (environmental (E), social (S), and governance (G)) individually contributes to FP, their integration into a composite ESG index results in the highest explanatory power (Adjusted $R^2 = 89.6\%$). This suggests that comprehensive and integrated ESG practices are more effective in enhancing firm profitability than focusing on individual components in isolation. These results are in agreement with prior empirical evidence in Saudi context [1, 12, 22], which affirmed the positive link between ESG disclosure and indicators such as ROA.

Furthermore, the analysis confirmed a statistically significant relationship between family ownership and financial performance, although the explanatory power of family ownership was relatively moderate (Adjusted $R^2 = 12\%$), the relationship was positive and meaningful, indicating that family-controlled firms on average achieve higher financial returns. These findings are consistent with those of [6, 27, 28], emphasized the role of long-term orientation and tighter control mechanisms in improving performance. However, this result stands in partial contrast with [13], found that family ownership might negatively affect FP in Saudi firms, pointing to the complexity and contextual dependence of this relationship. The most notable finding relates to the moderating role of family ownership in the ESG and FP relationship, the models incorporating interaction terms between ESG and family ownership illustrate a marked increase in explanatory power, with the composite interaction model reaching an Adjusted R^2 of 95.2%, these interaction effects were particularly strong for (E,G) dimensions, suggesting that family involvement enhances the financial benefits of ESG initiatives, possibly due to socio-emotional wealth motivations and a desire to preserve family legacy, this supports the conclusions [15, 33, 34], that family firms often engage in ESG strategically for long term value creation. Conversely, this finding differs from those of [39, 40], which reported that concentrated family control may hinder ESG engagement due to agency concerns. Overall, the evidence suggests that the presence of family ownership in Saudi firms plays a crucial conditional role in shaping the ESG and financial performance nexus. The study recommends that Saudi firms implement an integrated ESG disclosure approach that concurrently addresses ESG factors; the evidence unequivocally indicates that such comprehensive disclosure markedly improves financial performance and aligns with the strategic objectives of Vision 2030, especially in fostering corporate

transparency and long-term sustainability. Furthermore, regulatory bodies and policymakers ought to establish standardized ESG reporting guidelines that regard ownership structure as a pivotal element, also Initiatives that offer incentives for ESG compliance, training programs for family-owned enterprises, and awareness campaigns highlighting the financial advantages of ESG can expedite the integration of responsible corporate practices throughout the Saudi market.

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