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Enterprise Risk Management and Firms' Value Nexus: A Case of Saudi Emerging Market

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Abstract: The application of Enterprise Risk Management (ERM) practices in the companies could have a pleasant effect on the performance of firms in terms of reducing managerial and operational risks, which would also contribute positively to the firms' value. Therefore, the present study investigates the role of applying ERM on Saudi firms' value in Energy, Materials, and Capital Goods companies. For this purpose, data is collected from 41 companies during 2017-2020 in Energy, Materials, and Capital Goods, which are listed on the Saudi Stock Exchange. The data is collected from the annual financial reports of the companies, posted on the Saudi Stock Exchange. The statistical analysis corroborates that applying ERM contributed positively to the Saudi's Companies' firms' value. Moreover, the size of the audit office also improves the relationship between ERM application and firms' value. In addition, return on assets also helps to improve firms' value. However, the effects of firms' size and leverage show statistically insignificant effects on firms' value. Based on the results, the present study recommends that Saudi companies in the investigated sectors should implement the ERM practices to improve the firms' value.

Keywords: Enterprise; Enterprise Risk Management; Risk Management; Emerging Market; Saudi Arabia; Stock Exchange.

1 Introduction

The concept of Enterprise Risk Management (ERM) is gaining vital significance among business professionals. Instead of taking a compartmentalized strategy, businesses are using technology to identify and mitigate risk in a holistic manner. ERM necessitates the integration of multiple parts of a company, as well as multiple procedures, to collectively appreciate the level of an organization's exposure to risks that could distort corporate objectives and growth prospects. ERM examines existing data to assess if uncertainty would succeed or fail and makes decisions based on the provided possibilities. Risk management's main aim is to enhance the value of an investor's stock at large [1]. By using EMR, risks must be identified, managed, and responded to by management. Because risks cannot be removed in the business world. However, firms can utilize ERM to find, control, and respond to hazards by fostering a robust risk management culture throughout an industry [2]. Literature has corroborated that adopting ERM as a corporate strategy to improve the planning and decision-making procedures has a broad influence on firms' value and performance. [3,4,5] Saudi Arabia and the other oil-producing countries in the region are conducting the business in a similar fashion to the rest of the world. Moreover, despite differences in economic, societal, legal, and cultural surroundings, Saudi Arabian organizations are on par with western organizations in terms of adopting ERM systems. Saudi Arabian economy is robust and stable, despite its reliance on oil and foreign labor. However, the Saudi business environment has its own set of characteristics and demands to consider in implementing the ERM practices. There is abundant global literature on the implementation of the ERM and its effects on firms' value. However, to our knowledge, the literature is limited in investigating the role of the ERM on firms' value collecting firm-level data. Hence, this present study may claim a contribution in Saudi ERM literature by investigating the nexus between ERM practices and firms' value in 41 Energy, Materials, and Capital Goods companies [6].

2 Literature Review

Two theories lend themselves nicely to ERM, which are portfolio theory and contingency theory. Portfolio theory gives investors a framework for thinking about a portfolio's aggregate risk and helps them manage risk through diversification and asset allocation. Risk management on a portfolio basis brings value to organizations by allowing management to make educated decisions based on all risks that the company faces at the same time. According to the

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ERM approach, risks should be identified and addressed on a portfolio basis in order to balance them against potential returns. As a result, ERM helps a business in addressing and managing a wide range of risks, both financial and non-financial. Moreover, individual hazards might be reduced in contrast to overall risks using this collective way of merging and combining various types of risks, which would result in increased profitability and efficiency through cost reductions [7]. Moreover, Nocco and Stulz [8] argued that managing risks on a portfolio basis might keep a unified view of the different types of risks and would add value to an organization by permitting the administration to make informed choices. It is also simultaneously considering the various risks that the organization faces.

Scholars of enterprise risk management focus on five aspects, such as supply chain & operationalization financing, industrial organization, package prices, and managing disaster operations [9]. Blome and Schoenherr [10] created a band of suppositions about the way businesses manage supply risks during fiscal crises, highlighting how risk mitigating strategies have started to shift and demonstrating and how they are linked to ERM based on detailed case studies with eight European businesses. The approach has further been separated considering whether companies are mainly involved in production or services. This distinction would impact the issues related to supply chain handling. Thoroughly anchoring the research in both theory and empirical aspects, the researchers might float the significant knowledge, which would be helpful in policy implications for academics as well as for practitioners. Al-e-Hashem et al. [11] used a supply chain technique including many suppliers, producers, and clients to tackle multi-site, period & product aggregation production-planning issues in the wake of uncertainties. They recommended the solutions based on the LP-metrics approach and the industrial units were used to explain the implementations of the suggested method. The results showed that the suggested model may provide a mechanism for attaining successful supply chain production planning.

Jonek-Kowalska's [12] research focuses on the effectiveness of deploying a robust ERM system in Polish energy and fuel companies. The study evaluated the effectiveness of ERM software implementation in terms of fiscal results and risk exposure to corporate value. In the relation to financial results, a four-stage approach was used for efficacy measurement, which included documenting fiscal outcomes as profits and losses, the percentage change in the net fiscal result annually, profitability of net capital, and profitability of its capital. Enterprise value was calculated using Book Value (BV), Economic Value Added (EVA), and Market Value (MV). The ERM system was established by all of the evaluated companies with the significant risk vulnerability of the fuel and energy business in mind, which were notably market risks. Considering these, the deployment of ERM systems in a few of the investigated companies has resulted in verifiable financial statements and business value stabilization. After two years of monitoring, the assessment criteria have shown a significant variation over time and a lack of discernible development trends.

Working on the listed firms in the Taiwan Stock Exchange from 2004 to 2015, Wang et al. [13] explored the effect of ERM as a prospective moderator variable of the correlation in external financing activities and earnings management. The findings suggested that managers coped with financing using both real activities and receivables earnings. Faisal and Hasan [14] were looking for empirical evidence on the impact of ERM adoption on company value using panel data from manufacturing enterprises, which were registered in the Indonesia Stock Exchange during 2013-2017. Hence, the data was quantitative, which was acquired from secondary sources such as the Indonesian Stock Exchange's annual and financial reports. The empirical results of this study showed that the ERM application had a positive impact on corporate value.

The aim of utilizing ERM in the organization may be considered that the supervisors in firms should work to safeguard stakeholders' interests. In this way, the implementation of the ERM practices would effectively and positively impact the corporate value. Hence, the effective ERM application may have a favorable effect on the organization's performance and the growth in corporate value consequently. Therefore, this study aims to fill a vacuum in the Saudi literature exploring the effectiveness of the ERM in contributing to the firms' value in the context of Saudi companies.

3 Methods

3.1 Objectives and Hypothesis

The present research is an attempt to find practical evidence of the effect of applying ERM on the value of the enterprises using data from a sample of companies listed in the Saudi Stock Exchange during the period from 2017 to 2020 in the Energy, Materials, and Capital Goods companies. The general objective of this applied study is to analyze the effectiveness of the application of Enterprise Risk Management (ERM) to the value of the enterprises in Saudi Arabia. However, this goal is divided into the following sub-goals:

1.Evaluating the effectiveness of implementing ERM for a sample of companies listed on the Saudi Stock Exchange during the period from 2017 to 2020 using the content analysis method based on the effectiveness criteria set by the COSO [15] Committee to measure the effectiveness of enterprise risk management.

2.Measuring the market value of the sample companies based on the (Tobin's Q) model, which is a measure of the firm's market value.

3.Examining the impact of applying ERM on the value of joint-stock companies registered in the Saudi Stock Exchange in the above-mentioned sectors.

Research Hypothesis

The application of ERM has a statistically positive effect on the firms' value.

3.2 Targeted Population and Research Sample

The data are taken from 41 companies listed in Saudi Stock Exchange from 2017-2020 for the empirical analyses. The data is collected from annual financial statements of the firms classified in the domains of Energy, Materials, and Capital Goods companies.

than three years, has not achieved accumulated losses of 20% or more of its capital during the study period. Moreover, it has not been subject to a write-off, merger, or suspension during the study's period.

3. The financial reports of the firm are available regularly and disclosed in the Saudi currency through the firm's website to ensure the availability of sufficient data for analysis.

Table 1 shows the study population and the procedures for selecting the study sample.

Table 1: Population and sample selection.

No	Industrial Sector	No. of firms	Excluded Firms			Sample Firms	The ratio / sector	The ratio / sample
			The company has not been listed in the stock market for more than three years	It achieved accumulated losses of 20% or more of its capital during the study period	Incomplete data and other reasons			
1	Energy	5	1	-	-	4	81%	9.75%
2	Materials	42	-	2	11	29	69.04%	70.73%
3	Capital goods	12	-	4	-	8	66.66%	19.51%
	Total	59	1	6	11	41	69.49%	100%

The application of the above-mentioned conditions has resulted in the selection of 41 companies. The data are collected for 4 years. Hence, the total observations are 164, presented in table 2.

Table 2: Total Observations.

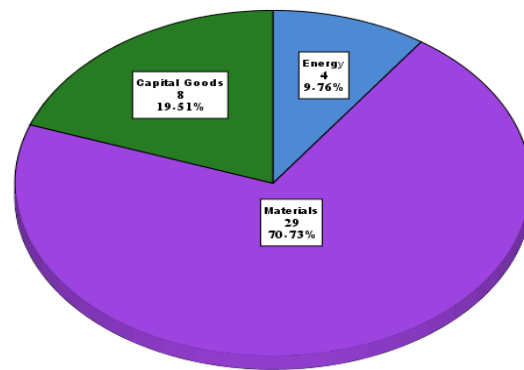| Information	Total
Companies listed on the Saudi's Stock Exchange (Energy, Materials, Capital Goods)	59
Excluded company	(18)
Companies used as sample	41
Research Period (2017-2020)	4
Total observations (41 companies x 4 years)	164

The firms are chosen based on the following conditions:

1. The firm's shares are listed on the Saudi Arabian Stock Exchange and are subject to trading throughout the study period.

2. The firm has been listed in the stock exchange for more

Fig.1: Study sample.

3.3 Data Description

The current empirical study mainly relies on content analysis of annual financial reports, on-financial reports, information

on the firm's website, information on the Saudi Arabian Stock Exchange website, and information available on relevant statistical analysis websites.

Data related to the study's variables were obtained from the following sources:

1. The sample firms' websites.
2. Saudi Arabian Stock Exchange website https://www.saudiexchange.sa
3. Mubasher Saudi website https://www.mubasher.info/markets/sa
4. Investing.com website https://sa.investing.com
5. Reuters website http://www.reuters.com/finance

3.4 Variables

Firm Value (FV)

The explained variable of the study is firms' value, which is calculated by Tobin's Q ratio as follows:

$$Tobin's\ Q = \frac{Total\ Market\ Value\ (TMV) + Total\ Book\ Value\ of\ Laibilities}{Total\ Book\ Value\ of\ Assets}$$

TMV represents the current value of total outstanding shares.

ERM Implementation

The efficacy of ERM implementation was used as the independent variable. The ERM is measured based on the points related to the board of directors' involvement achieving effectiveness of ERM as risk management context of COSO [15], which highlights 4 key indicators of the company board's role in assisting the firm's ERM implementation, which is following:

1. An assessment activity to comprehend the threat and its alignment with the firm's risk appetite.
2. The board of directors is cognizant of the fact that how well ERM has been implemented by the company's management.
3. The overall risk portfolio is scrutinized considering the company's risk appetite.4. Large-scale hazards are monitored by coping with acceptable risks.

These factors are measured from 1 to 3 to evaluate the completion of each criterion mentioned above. A weak enforcement criterion has delegated a value of one, a medium (fair) implementation criterion is assigned a value of two, and a good implementation criterion is assigned a value of three. Firms will get a minimum of 4 points, who do not follow COSO's efficiency standards. However, the maximum score is 12, which follows all standards in a good way. The following table shows the method of measurement:

Firm Size (FSIZE)

The firms' total assets in natural logarithm form are used to calculate the business size in this research. The complexity

Table 3: ERM based on COSO [15].

Firm	Assessment procedures for risk as	The ranking of the effectivene	A whole review of risk	The attentiveness of major handled	Total From (4-12)
	per risk appetite of firms. From (1-3)	ss of ERM in the knowledge of the board of directors. From (1-3)	portfolio as per risk appetite of firms. From (1-3)	risks. From (1-3)	
1: poor implementation		2: medium (fair)		3: good	

of risk must be dealt with by businesses. The number of risks associated with a rise in firm size tends to increase the possibility of applying the ERM. Larger organizations also tend to invest more in ERM programs [16]. Moreover, the bigger firms demand efficient risk-management systems as the risk would increase in terms of its breadth and complexity. Consequently, the bigger firms would have a positive impact on their value because of their capacity to implement the ERM [16, 17].

Return on Assets (ROA)

ROA is utilized as a profitability indicator, which can be used to evaluate a company's ability to maximize its assets in order to have a profit. ROA is a metric, which assesses a company's ability to generate income from its existing assets. Companies having a greater return on assets/investment (ROI) would have a greater capacity to invest in adopting the ERM. Consequently, ROA could positively affect the value of a company. It may be calculated by dividing the company's gross assets by its net profit before taxes (Lechner & Gatzert, 2018) [16].

Leverage (LEV)

The leverage ratio is a metric that measures how much money a firm borrows from outside sources to fund its growth and functioning. The company's high debt to asset ratio shows that it is in serious danger of repaying the debt or its interest. The leverage ratio of a corporation is determined by dividing the total liabilities by total assets (Lechner & Gatzert, 2018) [16].

Size of the audit office (BIG4)

The size of the audit office is introduced as an interactive variable to test its effect on the correlation between (Effectiveness of ERM Implementation) and the dependent variable (the value of the enterprise). It can be tested with the relationship between the two variables for the companies linked to the audit office (BIG4) versus the companies not connected to the office. The efficiency of the enterprise's risk management is influenced by the size of the audit office. Moreover, the firm's association with BIG4 offices increases the enterprise's worth as well. This is a dummy variable that takes (1) if the company is assessing its accounting statements at BIG4, or (zero) if it is not [18].

Table 4 provides a summary of all variables of the study in hand.

3.5 Model of the Study

In light of the objectives, variables, and hypothesis of the research, the research model can be formulated through the

following equation:

$$FV_{it} = \beta_0 + \beta_1 ERM_{it} + B_2 FSIZE_{it} + \beta_3 ROA_{it} + \beta_4 LEV_{IT} + \varepsilon_{it}$$

Where:

FV_{it} : Dependent variable, Firm Value measured using the Tobin's Q model.

ERM_{it}: Effectiveness of ERM Implementation

$Size_{it}$: Firm Size

ROA_{it}: Return on Asset

Lev_{it}: Leverage

ε_{it}: Amount of random error

Table 4: Variables and measurement method.

Type	Variables	Sym	Measurement Method
Dependent Variable	Firm Value	FV	Tobin's Q ratio
Independent Variable	Effectively of ERM	ERM	ERM application as
Control Variables	Firm Size	FSIZE	Total assets in log form.
	Return on Asset	ROA	dividing the net profit before tax by the company's total
	Leverage	LEV	The leverage ratio of the company is measured by the ratio of total liabilities to total assets
Interactive Variable	Size of The Audit Office	BIG4	This variable is measured as a dummy variable that takes (1) in the case if the company is reviewing its financial reports at one of (BIG4), or (zero) otherwise

4 Results and Discussions

Testing the validity of data is performed through a series of tests as follows:

4.1 Normal Distribution Test

This test is performed for the purpose of verifying the normal distribution of data and is performed by using both (Kolmogorov - Smirnov) and (Shapiro – Wilk) tests to ensure that the pattern of distribution of the study data, which is related to the continuous variables. It is following a normal to determine the type of tests that will be used in the statistical analysis of data whether parametric or non-parametric statistical tests.

The following table shows the values resulting from both (Kolmogorov Smirnov) and (Shapiro-Wilk) tests and the level of significance for each variable

Table 5: Distribution for Continuous Variables.

Continuous Variables		Kolmogorov -Smirnov Statistic		Shapiro-Wilk Statistic	
		value	Sig.	value	Sig.
Firm Value	FV	0.220	0.000	0.742	0.000
Firm Size	FSIZE	0.158	0.012	0.940	0.030
Return on Asset	ROA	0.111	0.200*	0.973	0.426
Leverage	LEV	0.100	0.200*	0.961	0.174

The previous table shows that:
- The level of significance (Sig.) for both (Kolmogorov-Smirnov) and (Shapiro-Wilk) tests is less than (0.05) for Firm Value and Firm Size variables and for (Return on Asset, Leverage) the significance levels are more than (0.05).
- Based on the previous conclusion on the variables' significance values, the data related to (Firm Value and Firm Size variables) are not following a normal distribution, while other variables data (Return on Asset, Leverage) is following a normal distribution.

Accordingly, it was considered when doing the statistical analysis to perform non-parametric tests for the data that do not follow a normal distribution.

4.2 Strength of the Study Model and Its Explanatory Ability

Testing the effectiveness and explanatory ability of the study model is performed to discover any issues of overlapping or linear duplication between the independent variables through the Multicollinearity Test (the Durbin Watson Test). This test aims to calculate the Variance Inflation Factor (VIF) for

each of the independent variables that affect the dependent variable. Additionally, the model variables are tested to verify that they are free from self-correlation problems. This can be clarified through the following table:

Table 6: Multicollinearity and Durbin Watson Test.

Independent Variables	Multicollinearity Test		Durbin Watson Test
	VIF	Tolerance	
ERM	1.253	0.798	2.476
SIZE	1.998	0.500	
ROA	1.568	0.638	
LEV	1.791	0.558	
BIG4	1.898	0.527	

The previous table shows that:
- Variance Inflation Factors (VIF) of all independent and control variables are less than (10), which means that the independent variables are free from both overlapping issues and linear duplication, as the correlation between them has no statistical significance and is very low, which indicates the strength of the model that is used for explanation and determination of model.
- Durbin Watson (DW) values are equal to (2.476), thus it falls within the ideal range which is within the range of (1.5-2.5), which indicates the absence of any auto-correlation issues between independent variables that may affect the validity of results

Based on the above, the independent variables are proved to be free from both overlapping issues and linear duplication; also there are no auto-correlation issues in the model variables. Therefore, the strength of the study models and their increase in their explanatory capacity is proved which can ensure the validity of the data for statistical analysis and any produced results.

Table 7 depicts the descriptive analysis for the study variables, which is a starting point for the analysis of the study.

Table 8 shows that there is an improvement in the Firms' value over the years of the study, as it increased from 1.304 in 2017 to 1.809 in 2020. The firms' average value during 2017-2020 for the sample firms was 1.432, which is satisfactory. The effectiveness of ERM implementation in the sample companies is reached at an average of 8.536, which is acceptable, but not good. The risk management in the study sample shows that there are 26 companies with an average of 9.807, which is good. However, 12 companies are fair in ERM implementation with an average of 6.916. Lastly, there are three companies with poor ERM implementation with an average of 4.

The average natural logarithm of total assets for sample firms had a maximum value of 7.98 in 2019, and these results confirm the increase in the size of the firms from 2017 (7.928) until 2018 (7.943). The average Return on Assets of

the sample firms had a maximum value of 0.0458. These results confirm the fluctuation of the profitability for the sample firms over the years of the study, where the average profitability reached 0.045, 0.025, 0.023, and 0.033 in years 2017, 2018, 2019, and 2020, respectively. The degree of financial leverage for the sample firms had an average of 0.431, and the maximum value for the financial leverage degree over the study period was 0.438. The percentage of the sample firms' commitment to audit their financial reports with one of the big audit firms (BIG4) or an associated is 46.3% over the study period. This percentage represents the size and quality of the audit firm for the sample firms.

To test the unilateral relationship between firms' value and the ERM, a correlation analysis is performed in table 8.

Table 7: Descriptive Statistics.

Continuous Variables	Year	Mean	Std. Dev	Max	Min
Firm Value (Over the study period)	FV 2017	1.304	0.458	2.98	0.78
	FV 2018	1.270	0.511	3.40	0.62
	FV 2019	1.344	0.456	2.93	0.91
	FV 2020	1.809	0.836	4.76	0.99
The Average	FV	1.432	0.514	3.06	0.94
Effectively of ERM Implementation	ERM	8.536	2.292	12.00	4.00
	Good ERM	9.807	1.720	NO.=26	
	Fair ERM	6.916	0.288	NO.=12	
	Poor ERM	4.000	0.000	NO.=3	
Firm Size (over the study period)	FSIZE 2017	7.928	1.748	12.58	4.89
	FSIZE 2018	7.943	1.739	12.60	4.99
	FSIZE 2019	7.980	1.751	12.61	5.05
	FSIZE 2020	7.974	1.741	12.62	5.24
The Average	FSIZE	7.956	1.742	12.60	5.04
Return on Asset (over the study period)	ROA 2017	0.045	0.047	0.14	-0.05
	ROA 2018	0.025	0.069	0.18	-0.14
	ROA 2019	0.023	0.060	0.21	-0.13
	ROA 2020	0.033	0.059	0.16	-0.16
The Average	ROA	0.031	0.048	0.17	-0.06
Leverage (over the study period)	LEV 2017	0.421	0.239	0.91	0.02
	LEV 2018	0.438	0.246	0.90	0.02
	LEV 2019	0.433	0.242	0.86	0.01
	LEV 2020	0.431	0.246	0.91	0.01
The Average	LEV	0.431	0.239	0.86	0.01
Audit Office Size (Variable Dummy)	Views		Number	Percentage	
	BIG4 : Value (1)		19	46.3%	
	Not from BIG4: Value (0)		22	53.7%	

Table 8: Correlation between the Hypothesis Variables.

Dependent variable	Independent Variables	ERM	FSIZE	ROA	LEV
FV	Pearson Correlation	0.808**	0.189	0.454**	-0.382**
	Sig.	0.000	0.118	0.001	0.007

* 5% level of significance
** 1% level of significance

The positive correlation coefficient indicates the existence of a direct correlation (positive). The correlation coefficient value also indicates the strength of the correlation relationship. Thus, there is a strong positive correlation with a significant relationship between the effectiveness of ERM implementation (ERM) and firms' value. The correlation coefficient is positive and is almost equal to 1 at a 1% level of significance. Based on the above analysis, the study finds a statistically significant relationship between ERM and firms' value, which supports the validity of the hypothesis of the research. To measure the aggregate impact of ERM on firms' value, table 7 shows the results of the regression analysis.

Table 9: Regression Analysis.

The Dependent Variable		Firm Value (FV)				
The Independent Variables		Regression coefficient (B)	Beta Value	t-value	Sig level	Sig
(Constant)	(B_0)	-0.052		-0.156	0.877	
Effectively of ERM Implementation	ERM	0.166	0.739	7.361	0.000	statistically significant
Firm Size	FSIZE	0.004	0.015	0.139	0.890	Not statistically significant
Return on Asset	ROA	2.713	0.253	2.322	0.026	statistically significant
Leverage	LEV	- 0.042	0.020	-0.167	0.868	Not statistically significant
model explanatory value		R^2 =0.707				
model overall significance Prob (F-Statistic)		ANOVA =0.000				

Table 9 reports the results of the regression. The R^2 value is 0.707, which shows that ERM, LEV, SIZE, and ROA are explaining the FV by 70.7%, and the rest 29.3% power of explanation is from outside the hypothesized model. Moreover, the p-value from the ANOVA test reflects the overall goodness of fit in the estimated model at a 1% level of significance. Hence, the effects of ERM, LEV, SIZE, and ROA on FV are well-fitted in the model. The effect of ERM from COSO is found positive on firms' value at a 1% level of significance. Hence, the application of ERM remains an effective tool in boosting firms' value.

Moreover, company size has a positive but insignificant effect on firms' value. Hence, company size could not

statistically help to raise the firms' value. Contrarily, Lechner & Gatzert [16] argued that larger firms could have resources to invest in the application of ERM and would increase firms' value. Moreover, larger firms would have better risk management systems [17]. The effect of ROA is positive and significant. Hence, income flows from assets help to raise firms' value. Lechner & Gatzert [16] argued that income flows from assets (ROA) provide the capacity to the firms to support the ERM application. Lastly, leverage shows a negative but insignificant effect on firms' value.
The estimated regression model can be presented as follows:
$FV_{it} = - 0.052 + 0.17 ERM_{it} + 0.004 Size_{it} + 2.71 ROA_{it} - 0.042   Lev_{it} + \varepsilon_{it}$
After the validity of the research hypothesis, which states a positive relationship between the ERM and firms' value. The impact of the size of the audit office (BIG4) on the

relationship between the ERM and firms' value is verified. This analysis is conducted by studying the relationship between ERM and the firm value for the sample companies associated with BIG4 audit firms versus the rest of the sample firms not linked to BIG4 audit firms. The results are presented in Table 10.

Table 10: Correlations and regression analysis with BIG4.

Analysis	Coefficient and Sig.	Firms (BIG4)	Firms (Non-BIG4)
Correlation analysis	Pearson Correlation	0.994	0.989
	Sig.	0.000**	0.000**
regression analysis	Coefficient regression	0.178	0.162
	Sig.	0.000***	0.000***

* 5% level of significance
  ** 1% level of significance

The results in table 10 confirm the higher value of both the correlation coefficient and the regression of the relationship between ERM and the firm value in the sample companies associated with (BIG4) audit firms than the sample companies not linked to (BIG4) audit firms. Considering the results, it is concluded that the size of the audit office positively affects the form of the relationship between ERM and the firms' value. Based on the above discussion and the results of the statistical analysis. It may be stated that the hypothesis is proved partially valid, and the size of the audit office (BIG4) positively affects the form of the relationship between ERM and the firm value.

5 Conclusions

The ERM application would help in reducing managerial and operational risks in a company. Hence, the ERM practices would improve the firms' efficiency and value. To validate this theoretical hypothesis, the present study examines the role of ERM application on firms' value in 41 Energy, Materials, and Capital Goods companies registered in the Saudi stock market. The data is collected from 41 companies' annual financial reports during 2017-2020 from the companies in Energy, Materials, and Capital Goods sectors. The empirical exercise is validated the hypothesized positive relationship between the ERM and the firms' value. Moreover, the size of the audit office (BIG4) promotes the strength of the relationship between ERM application and firms' value. Further, return on assets also accelerated the firms' value. But the effects of firms' size and leverage were found statistically insignificant on firms' value. The present study recommends that Saudi companies in Energy, Materials, and Capital Goods sectors implement the ERM practices to improve the firms' value.

Competing interests

The author declares that they have no competing interests.

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