International Journal of Applied Economics, Finance and Accounting
ISSN 2577-767X
Vol. 16, No. 2, pp. 199-207.
2023
DOI: 10.33094/ijaefa.v16i2.949

Enterprise risk management and firm value: Evidence from selected commercial banks in Sub-Saharan Africa

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Keywords:
Commercial banks
Enterprise risk management
Firm value
Sub-Saharan Africa.

JEL Classification:
G32; G19; M49.

Received: *3 February 2023*
Revised: *6 April 2023*
Accepted: *19 April 2023*
Published: *1 May 2023*
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Abstract

The study investigated the relationship between enterprise risk management and the firm value of quoted banks in Sub-Saharan Africa using an ex-post facto research design. A sample of twenty-seven (27) commercial banks was obtained from three (3) regions of Sub-Saharan Africa (Nigeria, South Africa, and Kenya). The dependent variable is the firm value (Tobin's Q), while the independent variable is enterprise risk management (measured using enterprise risk management size, independence, and disclosures). Secondary data were obtained from the annual reports and accounts of the sampled banks in Sub-Saharan Africa from 2012-2021. Data obtained were analyzed using descriptive statistics (mean, median, standard deviation, kurtosis, skewness, and Pearson correlation), diagnostic statistics (variance inflation factor, heteroscedasticity, Ramsey regression specification-error test, Cameron and Trivedi's decomposition of IM-test,) and inferential statistics (principal component analysis, fixed and random effects panel data regression). The fixed and random effects panel data regression results indicated that while enterprise risk management independence (t= 4.63; prob. = 0.000) and enterprise risk management disclosure (t= 2.68; prob. = 0.008) positively and significantly affect firm value, enterprise risk management size (t=-0.04; prob. = 0.967) insignificantly and negatively affects firm value in Sub-Saharan Africa. Among other recommendations, it was suggested that banks need to promote ERM practices as well as ensure risk compliance among banks in Sub-Saharan Africa. Additionally, banks should increase their level of independence of the risk committee while at the same time increasing their level of enterprise risk management practices in the region.

Funding: This study received no specific financial support.
Competing Interests: The authors declare that they have no competing interests.

1. Introduction

Predominantly, organisations (including banks) are confronted with numerous types of risks due to the dynamism in both the micro and macro environments, which require constant review. Fundamental among these dynamisms are changes in the profile and interconnectedness of risks, uncertainties, innovations, advancements in information technology (IT), and the rise of multi-polar global powers competing for influence and dominance, among others. These factors, along with the ever-increasing complexities in demand and supply, have been observed by Olayinka, Eriki, Arumona, and Ame (2017), Anton (2018), and Altanashat, Dubai, and Alhety (2019). They had led to a more widespread study of risks, in order to ensure that all risks that could affect organisations are suitably and proactively addressed, in order to avoid unpleasant surprises.

Over the years, several organizations (e.g. Enron, Worldcom, etc.) have collapsed as a result of the incapability in Enterprise Risk Management (ERM) (Abdullah, Janor, Hamid, & Yatim, 2017; Alawattegama, 2018). While some of these organizations adopted ERM in their framework, others opted for Traditional Risk Management (TRM). According to Abdullah and Ku Ismail (2015), TRM is an approach to risk management with a silo-outlook that fails to provide a comprehensive review of all risks facing organizations. Thus, a paradigm shift from a silo- based risk management to a more holistic approach is needed, which is where ERM comes in.

ERM refers to holistic strategies that attempt to evaluate and manage portfolios of risks confronting and those likely to confront organisations (Adegbie & Dada, 2018). The Committee of Sponsoring Organizations of the Treadway Commission (2017) sees ERM as the culture, practices, and capabilities that are integrated with strategy-setting and performance that corporate organizations rely on to manage risk so as to create, preserve

and realize value. COSO framework views ERM as encompassing environmental, social, and governance-related risks, which can enhance strategy-setting and performance.

ERM primarily applies efficient risk management in driving organizations' risks profile. Thus, for banks in Sub-Saharan Africa to be able to face the internal and external complexities of the global economy, they need to invest significant resources in ERM (see (Altanashat et al., 2019; Egberi, 2020)), particularly in areas of ESG – environmental, social, and governance-related risks, which is the focus of this study. The ERM framework has a low probability of failure and, instead, increases the value of the firm (Siyanbola & Adebayo, 2021).

Practically, ERM aims at strengthening organizations' ESG by supporting decision-making processes in selecting priorities, as well as identifying, analysing, and removing uncertainties that can create obstacles in areas of change and development (Yitayaw, 2021). Therefore, ERM involves the ability of an organisation to use its resources to identify, assess, monitor, treat, and report all risks that can affect change and development. In the literature, numerous studies have shown that ERM results in improved firms' value and performance (Alawattegama, 2018; Altanashat et al., 2019; Egberi, 2020; Odiri, Aruoren, & Okoro, 2021).

However, the work of Olayinka et al. (2017) shows that having a risk committee at the board-level does not result in improved performance and firm value. Thus, there is conflicting evidence on whether ERM leads to increased firm value and whether this holds true for banks in Sub-Saharan Africa, as it has not been thoroughly researched in a single study. In addition, there are diverse ERM measurements. While some studies use a dummy variable ('1' organizations that had implemented ERM and '0' if otherwise) (Altanashat et al., 2019; Egberi, 2020; Odiri et al., 2021), other studies employ a questionnaire designed to address ERM frameworks, including governance and culture, strategy and objective setting, performance, review and revision, and information, communication, and reporting) (see (Alawattegama, 2018; Altanashat et al., 2019)).

In this study, we used the ERM index (ERMI), which is the sum of ERM indicators: ΣStrategy+ ΣOperations + ΣReporting + ΣCompliance. This measure is commonly employed in the literature because it captures risk management components aimed at enhancing value and performance. In addition, the value of the firm was measured using Tobin's Q, which is similar to measures used in prior studies (Anton, 2018; Egberi, 2020; Husaini & Saiful, 2018; Odiri et al., 2021). To assess if ERM increases banks' value in Sub-Saharan Africa, the remaining parts of this paper are organised as follows: Review of Related Literature, Methodology, Results & Discussion, and Conclusion.

2. Review of Related Literature

2.1. Enterprise Risk Management (ERM)

The most classical definition of ERM was advocated by the Committee of Sponsoring Organizations of the Treadway Commission (COSO); Committee of Sponsoring Organizations of the Treadway Commission (2017) sees ERM as the culture, practices, and capabilities integrated with strategy-setting and performance that firms rely on to manage risk to create, preserve, and realize improved performance and value. In COSO's recent framework, ERM now embraces environmental, social, and governance-related risk to enhance strategy-setting, performance, and value. Additionally, the Committee of Sponsoring Organizations of the Treadway Commission (2017) sees ERM as a process of risk mitigation mechanisms put in place to spot-check and address current and potential risks which may affect the existence of such organisation.

To achieve this, an organisation must implement reasonable risk-assurance strategies aimed at realizing the set objectives. ERM is an essential framework for organizations, particularly after the global financial crisis, which led to the disappearance of most banks in Sub-Saharan Africa (Adegbie & Otitolaiye, 2020; Annor & Obeng, 2017; Bawa, Akinniyi, & Njarendy, 2018; Egberi, 2020; Odiri et al., 2021).

ERM is an instrument aimed at enhancing corporate governance practices, primarily via risk management in the banking industry (Schulte & Hallstedt, 2018). In the banking industry, risk entails credit, market, and operational risks (Jonek-Kowalska, 2019). According to Lobo, Siqueira, Tam, and Zhou (2019), a high magnitude of risk disclosure contains both mandatory and non-mandatory risk management disclosures. Most recently, there has been debate regarding whether to move organizations towards strategic risk management, which would result in distinct considerations of operational and strategic risks or not. ERM can be used to evaluate the performance and value dimensions of firms. The studies by Odiri et al. (2021) and Anton (2018) found that ERM significantly influences the value of the firm, while Odubuasi, Ofor, and Ilechukwu (2022), and Olayinka et al. (2017) showed that an enterprise risk committee does not lead to improved performance and firm value.

In this study, we employed three (3) ERM measures: ERM size, independence, and ERM disclosure index. We operationalized ERM size as the total number of individuals sitting on the risk committee of banks in Sub-Saharan Africa, which consists of both directors and non-directors. ERM independence refers to the percentage or ratio of non-executive directors and shareholders representatives in the risk committee to the total risk committee. On the other hand, the ERM disclosure index is the aggregate of the ERM components (strategy, operations, reporting, and compliance), disclosed by banks in Sub-Saharan Africa.

2.2. Firm Value

Predominantly, enterprise risk management studies use business performance construct in measuring the value of a firm (Okoro & Ekwueme, 2021; Okoro & Ihenyen, 2020). In the literature, diverse proxies for Tobin's

Q have been employed. For instance, Erickson and Whited (2012) used the market value of debt in addition to the market value of equity minus the replacement value of inventories over the replacement value of the capital stock. On the other hand, Whited and Wu (2006) employed the market-to-book value of assets as a proxy for Tobin's Q.

Of all Tobin's Q measures, there is no consensus on how to proxy it empirically, given that it is problematic to measure empirically. Thus, to resolve this, Barro (1990); Okoro (2014), and Okoro (2016) advocated stock market price use. Thus, Tobin's Q can be measured as the aggregate of market capitalization, total liabilities minus cash flows divided by total assets; this is the route the study adopted as its measurements of Tobin's Q. Besides, other studies (see (Anton, 2018; Danisman & Demirel, 2019; Faisal & Hasan, 2020; Husaini & Saiful, 2018)) showed that there is a relationship between ERM and improved firm value and performance.

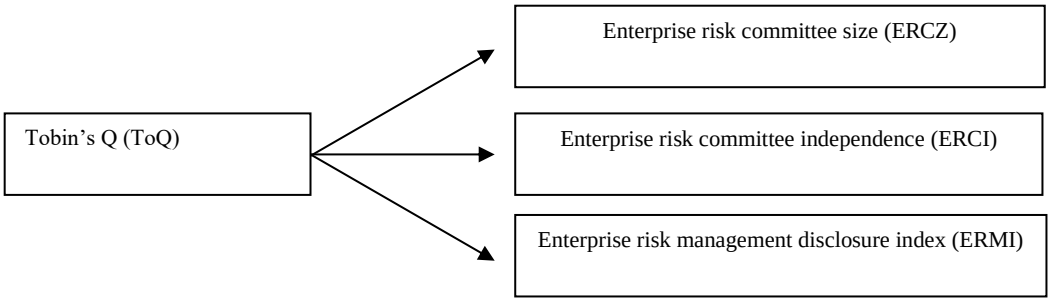

Figure 1. Conceptual model of the study.

Figure 1 illustrates the conceptual relationship between a firm's value (Tobin's Q) and the measures of enterprise risk management (enterprise risk size, independence, and disclosures); the conceptual model was done to provide a pathway for estimating the empirical model of the study.

2.3. Theoretical Underpinning

This study is based on the Modern Portfolio Theory (MPT) as its theoretical underpinning, which was advocated by Harry Markowitz and later popularized by William Sharpe. The underlying philosophy of MPT is centred around the characteristics of investment, which aims to maximize returns and minimise risks by carefully selecting different assets. MPT uses quantitative methods in selecting portfolios that are less volatile compared to individual assets because most of the risk components can be diversified (Nyagah, 2014).

Mandelbrot and Hudson (2004) asserted that through an efficient ERM approach, organizations can rely on the conventional principle of diversification, which advocates that "never put all your eggs in one basket" or portfolio. The relevance of MPT to this study is that ERM does not allow risks to be treated on a silo-based approach. Just as assets are combined in a portfolio to assess its collective risks, all the risks of the enterprise are centred on the risk management committee (RMC), which treats the risks when they are beyond the risk appetite of the organization.

3. Methodology

This study investigated the relationship between ERM and firm value in Sub-Saharan Africa. An *Ex-post facto* design was used, and the study population comprised all quoted banks in Sub-Saharan Africa. Sub-Saharan Africa is divided into four (4) regions: West, Southern, East, and Central Africa. One country was selected from each region (West: Nigeria; Southern: South Africa; and East: Kenya). Central Africa was excluded from the study due to the lack of available data on ERM.

Given the enormous nature of banks in Sub-Saharan Africa, a sample of twelve (12) banks was selected in Nigeria, nine (9) in Kenya, and six (6) in South Africa, totalling twenty-seven (27) banks in Sub-Saharan Africa. The sampling method was based on inclusive and exclusion criteria; the criterion used was centred on banks with national and international authorizations, as well as banks that had disclosed ERM indicators during the study periods. Hence, banks in Sub-Saharan Africa with national and international authorizations were included, while those without national and international authorizations were excluded from the study's sample.

Secondary data of ERM (proxied by enterprise risk committee size, independence and ERM disclosure index) and firm value (Tobin's Q) were obtained and computed from the annual reports and accounts of the selected banks in Sub-Saharan Africa from 2012-2021. These variables are similar to those used in prior empirical studies (Egberi, 2020; Ekinci & Poyraz, 2019; Gordon, Loeb, & Tseng, 2009; Odiri et al., 2021). The dependent variable is firm value while independent variable is ERM; given the above, the following empirical model was estimated:

$$Q_{it} = \alpha_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \mu_{it} \quad (1)$$

Equation 1 presents the implicit form of the regression model while equation 2 describe the explicit form of the regression model on the relationship between ERM and firm value. Where α, β, and μ are regression

constants; to estimate the model, we translated Equation 1 to Equation 2 to show the relationship between ERM and firm value:

$$ToQ_{it} = \alpha_0 + \beta_1 ercmz_{it} + \beta_2 erci + \beta_3 ermi + \varepsilon_t \quad (2)$$

Table 1. Operationalization of variables.

Parameters	Operationalization
Firm value (ToQ)	$\frac{\text{Market capitalization + Total liabilities – Cash flows}}{\text{Total asset}}$
Enterprise risk committee size (Ercmz)	Total number of directors and non-directors on the risk committee in a fiscal year
Risk committee independence (Erci)	Ratio of non-executive director and shareholder representatives in the risk committee to total risk committee members' size
Enterprise risk management disclosure index (Ermi)	Dummy variable for banks ERM information (Strategy + Operations + Reporting + Compliance); one (1) for companies disclosing ERM information and zero (0) if otherwise.
i=1,2,3, ...40	Number of banks used in the study
t =1,2, …10	Time period for the study (2012-2021)
$\beta_{1\text{-}3}$	Coefficient of the independent variable (ERM)
I_t	Error (Other variables not captured in the ERM model)

The data obtained were analysed via descriptive statistics (mean, median, standard deviation, skewness, kurtosis, and Pearson correlation); diagnostic statistics (variance inflation factor, Breusch Pagan-Cook test for heteroskedasticity, Ramsey regression specification-error test (RESET); Cameron and Trivedi's decomposition of IM-test & principal component analysis), and inferential statistics (fixed and random effect panel regression). The Hausman specification test was carried out to ascertain the most efficient model (FE or RE) for assessing the relationship between ERM and firm value. The analysis was carried out via STATA 13.0 version.

Table 2a. Summary of descriptive statistics (Nigeria).

Statistics	ToQ	Ercmz	Erci	Ermi
Mean	0.860	6.980	66.250	0.810
Median	0.800	7.000	62.500	1.000
Standard deviation	0.250	2.110	18.490	0.380
Kurtosis	23.700	3.720	3.550	3.670
Skewness	4.170	0.150	0.220	-1.630
N	120	120	120	120

4. Results and Discussions

Table 2a presents a summary of descriptive statistics for the dependent variable (Tobin's Q) and independent variables (enterprise risk committee size, enterprise risk committee independence, and enterprise risk management disclosure) for the sampled commercial banks in Nigeria from 2012-2021. The results show that Ermi (enterprise risk management disclosure) had a mean of 0.81, indicating that banks inadequately disclose ERM information, including strategy, operation, reporting, and compliance. This is because Ermi did not assume a perfect score of 1.0.

Furthermore, the enterprise risk committee size (Ercmz) and risk committee independence (Erci) had a mean of 6.98 and 66.250 respectively. This implies that approximately 7% of directors and non-directors were on the risk committee, while a significant level of independence of risk committee was recorded at 66%. Erci had the highest dispersion of 18.490, while ToQ had the least at 0.250. The standard deviation values revealed relative changes in the variables from 0.250 to 18.490. Additionally, the standard deviation values for Ercmz (2.110) and Ermi (0.380) showed relatively low dispersion of banks' risk committee size and disclosure index in Nigeria. Furthermore, the skewness values for ToQ (4.170), Ercmz (0.150), and Erci (0.220) are positive, except Ermi (-1.630) that is negative. This suggests that, in Nigeria, the firm's value variable (ToQ) and the enterprise risk committee size and risk committee independence variables moved in similar directions, while the enterprise risk management disclosure index moved in the opposite direction to the other study variables. Furthermore, the kurtosis values for ToQ (23.700), Ercmz (3.720), Erci (3.550), and Ermi (3.670) were greater than 3 (leptokurtic distribution), suggesting increased chances of tremendous positive firms value due to efficient ERM practices in Nigeria.

Table 2b shows that Ermi that enterprise risk management disclosure had a mean of 0.980, which indicats that banks in Kenya inadequately disclosed information related to their ERM strategy, operation, reporting, and compliance. Ermi did not assume a perfect score of 1.0. Additionally, Ercmz and Erci had mean of 3.700 and 77.360 respectively. This implies that only 4% of directors and non-directors served on the risk committee, while a high level of independence (about 77%) was recorded, which was higher than in Nigeria.

Table 2b. Summary of descriptive statistics (Kenya).

Statistics	ToQ	Ercmz	Erci	Ermi
Mean	0.200	3.700	77.360	0.980
Median	0.190	4.000	100	1.000
Standard deviation	0.110	1.860	35.830	0.100
Kurtosis	3.740	3.990	3.670	97.200
Skewness	0.670	-0.760	-1.500	-9.790
N	99	99	99	99

Erci recorded the highest dispersion (35.830), while ToQ recorded the least dispersion (0.110). The standard deviation showed relative changes in the variables revolving around 0.110-35.830. The standard deviation values for Ercmz (1.860) and Ermi (0.100) revealed relatively low dispersion of banks' risk committee size and disclosure index in Kenya, which were similar to those recorded in Nigeria (see Table 2a).

The skewness values for Ercmz (-0.760), Erci (-1.500) and Ermi (-9.790) are negative, except for Tobq (0.670), which is positive. This suggests that in Kenya, while firm value (ToQ) moved in the opposite direction, Ercmz, Erci and Ermi moved in the same direction but in the opposite direction with ToQ. Moreover, the kurtosis values for ToQ (3.740), Ercmz (3.990), Erci (3.670), and Ermi (97.200) were more than 3, indicating increased chances of tremendous positive firm value due to efficient ERM practices in Kenya.

Table 2c. Summary of descriptive statistics (South Africa).

Statistics	ToQ	Ercmz	Erci	Ermi
Mean	1.120	6.040	85.710	0.390
Median	1.020	6.000	100	0.000
Standard deviation	0.480	2.440	23.460	0.490
Kurtosis	4.060	3.700	8.620	3.180
Skewness	0.400	0.090	-2.310	0.430
N	66	66	66	66

Table 2c revealed that Ermi had a mean of 0.390; this indicates that ERM information (strategy, operation, reporting, and compliance) in South Africa was inadequately disclosed by banks since Ermi did not assume a perfect score of 1.0. Also, Ercmz and Erci had a mean of 6.040 and 85.710 respectively; this implies that there were about 6% of directors and non-directors on the risk committee while a significant level of independence of the risk committee was recorded amounting to about 86%, which was higher than Nigeria and Kenya.

Erci had the highest dispersion (23.460), while ToQ had the lowest value of 0.480. The standard deviation showed relative changes in the variables revolving around 0.480-23.460. The standard deviation values for Ercmz (2.440) and Ermi (0.490) revealed relatively low dispersion of banks' risk committee size and disclosure index in South Africa. These results were similar to those recorded in Nigeria and Kenya (see Table 2a-2b).

The skewness values for ToQ (0.400), Ercmz (0.090), and Ermi (0.430) were positive, except Erci (-2.310), which was negative. This suggests that in South Africa, the firm's values moved in the same direction with Ercmz and Ermi, while Erci moved in the opposite direction to the all variables of enterprise risk management and firms' value. Moreover, the kurtosis values for ToQ (4.060), Ercmz (3.700), Erci (8.620), and Ermi (3.180) were more than 3, indicating increased chances of tremendous positive firms' value as a result of efficient practices of ERM in Kenya.

Table 3. Pearson correlation (KPC).

Parameters	ToQ	Ercmz	Erci	Ermi
ToQ	1.000			
Ermi	0.221	1.000		
Erci	0.002	0.322	1.000	
Ercmz	-0.027	-0.681	0.522	1.000

Table 3 shows that ToQ, Ermi(0.221), and Erci(-0.002) are positively correlated, while Ercmz (-0.027) is negatively correlated with ToQ. This suggests a positive relationship among enterprise risk management independence, enterprise risk management disclosure, and the value of banks. In contrast, a negative relationship exists between enterprise risk committee size and the value of banks in Sub-Saharan Africa. Furthermore, the correlation coefficients show that no two pairs of independent variables were perfectly correlated. This is because none of the coefficients surpassed 0.8 (Gujarati, 2003 cited in Okoro and Ekwueme (2021) and Okoro and Ihenyen (2020)).

Table 4a shows the VIF results for the sampled commercial banks in Sub-Saharan Africa. The mean VIF value is 1.85, which is less than the conventional VIF threshold of 10. This indicates that there no multicollinearity in the model of enterprise risk management and firm value in sub-Saharan Africa. Thus, the panel dataset (ToQ, Ercmz, Erci & Ermi) satisfies one of the assumptions of linear regression.

Table 4a. Variance inflation factor (VIF).

Parameters	VIF	1/VIF
Ercmz	2.310	0.434
Erci	1.870	0.535
Ermi	1.380	0.725
Mean VIF	1.850	0.565

Table 4b. Breusch-Pagan/Cook-Weisberg test for heteroscedasticity.

Chi1(1)	=	21.240
Prob. > chi2	=	0.000

The Breusch-Pagan/Cook-Weisberg test for heteroskedasticity resulted in a value of 21.240 with Prob.> F=0.000 Table 4b, which is less than 0.05% level of significance, suggesting the absence of heteroskedasticity problem in the model of the study. This suggests that the panel dataset does not contain unequal variance. Furthermore, the absence of heteroskedasticity in the panel dataset satisfies another assumption of linear regression.

Table 5. Ramsey RESET test.

F (3, 278)	=	2.560
Prob. > chi2	=	0.055

Table 5 presents the results of the Ramsey regression specification-error test (RESET) for omitted variables and fitted values of the dependent variable (ToQ) in the model. The test revealed an F(3, 278) value of 2.560 with Prob. > F= 0.055, suggesting that the powers of fitted values have no relationship, indicating that there are no omitted variables in the model. Furthermore, the results suggest that the model does not suffer from functional misspecification, which is a condition where the functional form of the model does not match the true relationship between the independent and dependent variables. Overall, the results of the RESET test provide further evidence that the model is appropriate for analysing the relationship between the variables in Sun-Saharan Africa.

Table 6. Cameron and Trivedi's decomposition of IM-test.

Source	Chi2	Df	P
Heteroskedasticity	43.070	9	0.000
Skewness	17.280	3	0.001
Kurtosis	6.890	1	0.009

Table 6 shows Cameron and Trivedi's decomposition (CTD) of the information matrix (IM) test. The CTD-IM test was carried out to ascertain if the models of ERM and firm value do not violate any of the axioms of panel data regression for the purpose of making suitable inferences. The results for heteroskedasticity (Chi2 = 43.070; p-value = 0.000 <0.050), skewness (Chi2=17.280; p-value=0.001), and kurtosis (Chi2=6.890; p-value=0.009) are statistically significant, suggesting that the models of ERM and firm value did not violate any of the axioms of panel data regression. Thus, the dataset satisfies the basic axioms of panel data regression, such as normality, multicollinearity, heteroscedasticity, and information decomposition.

Table 7. Commonality of the variables.

S/N	Variables	Uniqueness	Commonality Σ(loading)2 or 1(-Uniqueness) %
1	Erci	0.162	83.780%
2	Ermi	0.260	73.990%
3	Ercmz	0.513	50.290%

Table 7 suggests that enterprise risk management independence (Erci) had the highest commonality at 83.780%, followed by the disclosure of enterprise risk management (Ermi) at 73.990%, while enterprise risk committee size (Ercmz) had the least commonality at 50.290%. This implies that Erci is the strongest predictor of firm value, while Ercz is the weakest predictor. Therefore, Erci is the most reliable measure for predicting a firm's value in sub-Saharan Africa.

Table 8 shows that the coefficients are 0.052 (Erci), -0.0040(Ercmz), and 0.042(Ermi), indicating that an increase in enterprise risk management independence (Erci) and enterprise risk management disclosure (Ermi) of banks in Sub-Saharan Africa would lead to about 5.21% and 4.22% increase in firm value (ToQ) while increasing the size of enterprise risk management (Ercmz) would lead to a decrease in firm's value by 0.040%.

Furthermore, the t-test results of Erci (t= 4.630; prob. = 0.000), and Ermi (t= 2.680; prob. = 0.008) showed that they are statistically significant in explaining their effects on the value of banks (ToQ) in Sub-Saharan

Africa. On the other hand, Ercmz (t=-0.040; prob. = 0.967) is statistically insignificant and has a negative effect on the value of banks (ToQ) in Sub-Saharan Africa.

Table 8. Fixed and random effects regression for ERM and firm value in Sub-Saharan Africa.

Estimator(s)	Fixed effect (FE)		Random effect (RE)	
Variable(s)	**Coefficient**	**Prob.**	**Coefficient**	**Prob.**
Erci	0.052 (4.630)	0.000	0.053 (4.820)	0.000
Ercmz	-0.001 (-0.040)	0.967	-0.001 (-0.010)	0.997
Ermi	0.042 (2.680)	0.008	0.041 (2.640)	0.008
_cons.	0.396 (3.88)	0.000	0.393 (3.930)	0.000
F-value	(F, 3, 271) = 7.180			
F-probability	0.001			
R-Squared (Within)	0.074			0.074
R-Squared (Between)	0.262			0.265
R-Squared (Overall)	0.077			0.077
Wald Ch2(3)				23.490
Prob. Ch2				0.000
Hausman test	Chi2(2) = 1.700		Prob>Chi2= 0.637	

Besides, the overall R^2 is 0.077 for FE, indicating that all the ERM variables collectively explain about 7.71% of the variation in firm value (ToQ). This implies that other variables that influence the value of banks (ToQ) in Sub-Saharan Africa. Hausman specification result (Prob>Chi2= 0.647 > 0.050) suggests that FE is more efficient than RE. Therefore, the F-value supports the claim that enterprise risk management (ERM) significantly influences banks' value in Sub-Saharan Africa.

Over the years, some organizations have collapsed due to their inability to adequately engage their enterprise risk management committee to mitigate the risk they face (Abdullah et al., 2017; Alawattegama, 2018). While some organizations have adopted traditional risk management, others have adopted the ERM framework, which is viewed as a holistic risk management framework. Consequently, most organizations in sub-Saharan Africa, including banks, have embraced ERM.

Using the coefficients of the fixed and random effects panel data regression, we found that increasing enterprise risk independence and enterprise risk management disclosure of banks in Sub-Saharan Africa would lead to an increase in firm value while increasing enterprise risk management size would lead to a decrease in firm value. This finding agrees with the results of Odiri et al. (2021) and Anton (2018), who found a significant and positive effect of ERM on firm value. Contrarily, the results of the study disagree with the findings of Odubuasi et al. (2022) and Olayinka et al. (2017), who found a negative and insignificant effect of ERM on firm value.

On the basis of the R-squared value, it can be inferred that ERM variables have limited predictive ability on the value of banks in sun-Saharan Africa. Other factors such as capital adequacy, assets quality, liquidity level, earnings capacity, and firm attributes (e.g. firm size, age, leverage, etc) may also play a role in determining the value of banks in the region.

The results of the study conform to MPT where ERM does not allow risks to be treated on a silo-basis. Instead, all risks of the management committee, who then treats risks when they are beyond the risk appetite level. This approach is similar to how assets are combined together in a portfolio to assess their aggregate risk (Mandelbrot & Hudson, 2004; Nyagah, 2014).

5. Conclusion

The main aim of this study was to examine the relationship between ERM and firm value in Sub-Saharan Africa. Data of ERM (enterprise risk management size, independence and disclosure) and firm value (Tobin's Q) measures were obtained and computed from the annual reports, and accounts of twenty-seven (27) commercial banks in Sub-Saharan Africa from 2012-2021. Both descriptive and inferential statistical tools were employed in the analysis of data, and the results provide some insightful revelations.

Given the results of the study, it is recommended that banks need to promote ERM practices, particularly in their strategy and operations, as well as ensuring risk compliance among banks in Sub-Saharan Africa. Furthermore, findings indicate that increased independence of the risk management committee can improve the value of banks. Therefore, there is a need for banks in Sub-Saharan Africa to increase the level of independence of the risk committee. Additionally, ERM disclosure was ranked next to increase the value of banks. Hence management of banks should increase their levels of ERM practices in Sub-Saharan Africa.

Furthermore, banks in Sub-Saharan Africa should concentrate more on enhancing independence and disclosure of their ERM and ensure a reduction in the size of their enterprise risk management committee by reducing the number of directors on the committee. The study has contributed to knowledge by establishing that while enterprise risk management independence and enterprise risk management disclosure significantly and positively affect the value of a firm in Sub-Saharan Africa, enterprise risk management size does not. Finally, given the low R-squared value, which suggests the presence of other variables that may predict firm value in Sub-Saharan Africa, researchers should investigate whether firm attributes (such as firm size, listing age, leverage, etc) moderate the relationship between ERM and firm value in Sub-Saharan Africa.

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