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Financial Risk and Financial Performance of Energy and Petroleum Firms Listed at Nairobi Security Exchange; Kenya

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Abstract:
Energy firms are facing financial risks which have led to poor financial performance in this sector and in the process, energy and petroleum firms have increased the charge out rate which has increased the standard living by increasing the prices of the commodity. The increase in energy prices is attributed to increase in cost incurred in relation to credit risk, cost incurred by the energy firms in the production of power. This study therefore sought to determine financial risk and financial performance of energy and petroleum firms listed at NSE in Kenya. Specifically, the study sought to examine the credit risk and financial performance of energy and petroleum firms listed at NSE in Kenya, determine the liquidity risk and financial performance of energy and petroleum firms listed at NSE in Kenya, to establish the interest rate risk and financial performance of energy and petroleum firms listed at NSE in Kenya and evaluate the influence of foreign exchange rate risk and financial performance of energy and petroleum firms listed at NSE in Kenya. The study adopted a descriptive research design. The target population for this study was four energy and petroleum companies listed on the Nairobi Securities Exchange namely Total energies, Umeme, Kenya Power Lighting Company and Kenya Electricity Generating Company. Census method was adopted in this study. A secondary data collection form was used to collect the data. Panel data was used. The data was coded and then imported into STATA software for analysis; codes were assigned to each response. The dataset was then verified if the data correlates with captured data into STATA Version 13. Panel regression model was used in the present study to model the linear association between explanatory dependent (financial performance) and independent variables (credit risk, liquidity risk, interest rate risk, and foreign exchange rate risk). The main model for statistical analysis was derived from the main objective of the study. The study conducted pilot test and found that the data collected was adequate and could be used for further analysis. Also, the data met the panel regression assumptions of multicollinearity, stationarity, autocorrelation, normality, and linearity. Through pilot test, the study computed Husman test and identified that random effect was preferred. The results revealed that credit risk, liquidity risk, interest rate risk, and foreign exchange rate risk have significant negative effect on financial performance of energy and petroleum firms listed at NSE in Kenya. The study therefore, concluded that financial risk and financial performance of Energy and Petroleum Firms Listed at Nairobi Security Exchange are negatively related implying that increase in financial risks used in this study would results to decrease in financial performance. The study recommended that energy and petroleum firm in Kenya should maintain optimal liquidity to ensure organizational efficiency and effectiveness and upholding of good relations with stakeholders. Further, the government through Central Bank of Kenya should take necessary steps to increase the value of domestic currency; this will help to safeguard the profitability of the energy firms.

Key Word: *Liquidity Risk, Foreign Exchange Risk, Interest rate Risk, Credit Risk, Financial Risk Financial Performance, Listed Energy and Petroleum Firms, Nairobi Security Exchange*

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I. Introduction

The performance of the global economy has been affected by crises like the unforeseen Covid-19 pandemic that hit the world in 2019 and led to an economic slowdown. The previous global economic crisis was the financial crisis of 2008–2009 which was attributed to excessive risk appetites by financial institutions (Agustina, Linda, & Niswah, 2016). The crisis led to an erosion of the investor trust in the ability of firms to manage risks effectively (Dey, Syed, & Zabihollah, 2018). However, a study by Wamalwa and Mukanzi (2018) on nonfinancial firms indicated that "the 2008–2009 financial crisis did not significantly affect established risk management practices and firms' commitment to financial risk". Therefore, the success of any organization depends on sound financial management.

Agustina, Linda, and Niswah (2016) posit that financial risks face several companies since their valuation especially the listed companies rely on market-related factors that make financial risks. This further affects how such companies perform financially as well as their general competitive advantage. Financial performance studies the companies' financial health concerning the effective use of resources leading to maximization of profits and sustainability of wealth generation to shareholders (Nyasaka, 2017). Companies around the world have made substantial investments in personnel, processes, and technology to help control business risk (Mugi, 2015). Historically, these risk investments have focused primarily on financial controls and regulatory compliance. Too many institutions took on excessive risk with too little regard for reasonable, realistic long-term performance expectations. The debacle is focusing minds on more robust approaches to financial risk management, with a new imperative to keep pace with financial innovation, performance incentives, and business goals. Reforms will stretch financial risk management across the organization and involve systematically linking financial risk and corporate performance management, leading to an informed view of reward (Parlak, & İlhan, 2016).

According to Lelgo and Obwogi (2018), credit risk is the most common type of financial risk that hinders company performance in Africa. Due to the failure of the rival's legal debt to meet the regulations, this risk affects the net worth of assets. Liquidity inadequate cash for daily operational requirements increases risk, reducing institutions' capacity to fulfill their liabilities as they become due. The risk of loss when a firm in a foreign exchange transaction pays the currency it sold but does not get the currency it bought is called a foreign exchange settlement risk (Kioko, 2019). Energy companies in Kenya rely on imported fuel for satisfying their customers' needs. The whole business of international trade involves several risks ranging from foreign exchange rate fluctuations to highly dynamic international crude oil prices (PIEA, 2018). The whole business from procurement to sales at the pump station involves several financial risks that call for managing to ensure higher financial performance. High fluctuations in international oil prices and frequent reviews of oil prices on the local market have meant that oil companies keenly manage their financial exposures closely to ensure stability in financial performance (PIEA, 2018). Proper management of risks ensures that the financial earning capacity of a firm is enhanced and guarantees future firm growth. Therefore, strong financial risk management practices can help energy firms reduce their exposure to financial risks, and enhance their ability to compete in the market with other well-established institutions (Iqbal and Mirakhor, 2017).

The energy and petroleum industry is operating in an ever-changing environment. Traditional energy companies must revise their business strategies and adapt to new market conditions. In addition, more companies are entering renewable energy industries. The Paris Agreement of October 2016 foreshadows the need for governments, and thus indirectly corporations, to implement new measures to meet the climate standards (United Nations, 2015). Firms must employ a variety of techniques to mitigate the negative consequences of new laws and regulations. Furthermore, organizations often employ a variety of tactics to strengthen their market position and improve their performance, with the research being equivocal on whether characteristics have a good impact on it (Westerman et. al, 2020)

United Nations (2015), Adoption of the Paris Agreement, United Nations Framework Convention on Climate Change secretariat, United Nations Framework Convention on Climate Change secretariat (UNFCC), Bonn. Because of load increase, the scarcity of fossil fuel resources, and the pollution caused by traditional generators, the need for renewable energy sources is growing rapidly. Renewable energy sources generate electricity from natural resources and emit less pollution than conventional fuel-based generators. Integrating renewable energy sources into the main grid give various advantages like minimizing real power losses, cutting pollution level, and lowering the expensive system of conventional fuel-based generator reserve (Al Talaq, 2020). However, total financial analysis for integrating renewable energy sources into the grid, as well as power quality issues, must be addressed. Overvoltage, under voltage, transient stability, and harmonics all has an impact on the overall system's optimal behavior and power quality.

Onsongo, Muathe, and Mwangi (2020) did a study on financial risk and performance of commercial and services listed companies in the Nairobi securities exchange, Kenya. The objective was to determine the impact of financial risk on the performance of these firms. Credit risk had an insignificant positive impact on return on equity (ROE), while liquidity risk had a considerably negative effect on ROE and operational risk had a positive but insignificant impact on ROE, according to the findings. The positive coefficients from the data analysis indicated that commercial and service companies at NSE were able to take on more credit to boost their performance, but the negative coefficients indicated that these companies had high financial difficulties during the study period, with current liabilities surpassing current assets.

Mwangi (2019) in his study determined the relationship between financial risk and financial performance of manufacturing firms listed on the Nairobi security exchange. Liquidity risk had a negative effect which was a sign on financial performance, interest rate risk had an insignificant negative effect on financial performance. In his study, he found that this risk is associated with a firm's future financial position. Data were analyzed using panel data methods. In Kenya, credit risk is one of the financial risks that have affected the oil

marketing firms. Githiomi (2018) noted that credit is applied by these firms to influence demand through increasing sales volume, presence in the market, and profits. Credit is a risky affair as it affects a firm's returns and the level of exposure to losses. If the credit risk is not efficiently managed it may lead to liquidity problems whereby short-term obligations far exceeds the rate of cash inflows, in severity it can lead to insolvency and collapse or bankruptcy

Statement of the Problem

The financial performance of energy and petroleum listed on the Nairobi securities exchange in Kenya has sent mixed signals The Annual financial reports for Total Kenya from 2016 to 2020 indicated the Return On Equity (ROE) was as following 2016 was 11.54% in 2017 increased to 12.80%in 2018 it declined to 10.20% in 2019 it raised slightly to 10.40% and 2020 it increased slightly up to 12.27%. The Annual reports for Kengen from 2016-to 2020 Indicated the Return on equity (ROE) as follows in 2016 it was 3.9% in 2017 it rose slightly to 5.0% in 2018 it declined to 4.15% in 2019 it declined slightly to 4.04% and in 2020 it rose again to 8.10%. In the annual reports for Umeme from 2016-to 2020 the Return On Equity (ROE) was as follows, in 2016 was 22.24% in 2017 it declined up to 5.74% in 2018 it rose to 18.39%in 2019 it fall to 16.69% and in 2020 it also declined to 5.36%. The Annual reports for KPLC from 2016-to 2020 Indicated the Return on equity (ROE) as follows in 2016 it was 11.5% in 2017 it decreased to 8.34% in 2018 it rose to 23% in 2019 it declined to 1.6% and in 2020 it increased slightly by 2.43% Various studies have been conducted on financial risk and financial performance. For instance; Githiomi (2016) conducted a study on the effects of financial risk management practices on the financial performance of oil marketing companies in Kenya and found that Credit is a risky affair as it affects a firm's returns and the level of exposure to losses. Mukanzi, Maliesto, and Maniagi (2016) conducted a study on the influence of financial risk on the stock return of non-financial firms listed on the Nairobi securities exchange. Ochieng and Karanja (2016) conducted a study on the effect of financial leverage on the financial performance of deposit-taking savings and credit co-operative in Kenya. Of the reviewed studies, most of them have been conducted in the financial services industry. Thus, the current study seeks to examine the financial risk and financial Performance of Energy and petroleum Firms listed at NSE in Kenya. Specifically, the study seeks to explore how credit risk, liquidity risk, interest rate risk, and foreign exchange rate risk influence the financial performance of energy and petroleum firms listed at NSE in Kenya.

Objectives of the Study

i) To examine credit risk and financial performance of Energy and petroleum firms listed at NSE in Kenya.
ii) To determine liquidity risk and financial performance of Energy and petroleum firms listed at NSE in Kenya.
iii) To establish interest rate risk and financial performance of energy firms listed at NSE in Kenya.
iv) To evaluate foreign exchange rate risk and financial performance of Energy and petroleum firms listed at NSE in Kenya.

Research Questions

i. What is the effect of credit risk and financial performance of Energy and petroleum firms listed at NSE Kenya?
ii. What is the effect of liquidity risk and financial performance of Energy and petroleum firms listed at NSE in Kenya?
iii. What is the effect of interest rate risk and financial performance of Energy and petroleum firms listed at NSE in Kenya?
iv. What is the effect of foreign exchange rate risk and financial performance of Energy and petroleum firms listed at NSE in Kenya?

II. Literature Review

Theoretical Framework

The study was guided by the following theories; International Fisher Effect Theory, Arbitrage Pricing Theory, Neo-classical theory and Liquidity Preference Theory

Liquidity Preference Theory was proposed by John Maynard Keynes (1936). The interest rate is said to be unstable because of the fluctuation in interest rates across trade partner nations, according to this hypothesis. Furthermore, interest rate parity is the differential between interest rates in foreign nations and interest rates in the United States. According to Isiaka and Lasisi (2018) parity means that the difference in interest rates between two currencies is reflected in either a discount or a premium for the forward exchange rate on the foreign currency, with no sale or purchase of currency taking place in the financial market. Liquidity risk is

connected to liquidity, according to Olawale (2016), since investors prefer liquidity. The liquidity preference theory, as explained by Keynes, includes three reasons that influence how much liquidity is needed. Individuals desire liquidity, and as a result, they must have enough cash on hand for fundamental transactions because income is not always accessible. The transaction motivation is the term for this. This motivation implies that an individual's need for liquidity is driven by his or her income; high-income levels are equal to how much people or The precautionary motivation is the requirement for liquid cash to function as a backup; this is an extra layer of security in the case of an unexpected occurrence or circumstance that necessitates a substantial financial investment. Apart from these two reasons, individuals also have a speculative motive, which forecasts that bond prices will continue to decrease rapidly, allowing the investor to utilize liquid cash to invest in assets with higher future returns (Zaidanin & Zaidanin, 2021). The speculative motive suggests that investors are afraid to commit cash for investment capital now because they are worried about missing out on greater possibilities in the future. Liquidity Preference Theory, the theory supports liquidity risk.

Irving Fisher proposed the International Fisher Effect theory in 1930. According to him, there is a tradeoff between changes in the foreign rate of exchange and interest rate changes. Because of arbitrage opportunities across financial markets, which generally take the form of capital flows, the Fisher effect asserts that real rates of interest across nations are the same. The real rate of interest equivalency states that a country with a lower interest rate should likewise have a lower inflation rate. However, this causes the actual currency worth of a country to depreciate over time (Isanzu, 2017).

The connection between relative interest rates and foreign currency rates is explained by the interest rate theory of exchange rate expectations. The nominal rate of interest differentials shows the differences in exchange rates between two states. This is referred to as the International Fisher effect by Giddy (1997), and it is closely related to Irving Fisher's observation of the Fisher effect. Where the international Fisher effect prevails, interest rates in gaining currencies tend to be low and interest rates in declining currencies tend to be high. This helps to minimize the effects of projected currency gains and losses. According to Al-Eitan, and Bani-Khalid, (2019) foreign currencies with relatively high-interest rates are more likely to devalue since the high nominal rates of interest reflect the projected inflation rate. The theory supports the foreign exchange rate risk.

Arbitrage Pricing Theory was introduced by Ross in 1977. This theory holds that the expected return of a financial asset can be modeled as a linear function of various macroeconomic factors or theoretical market indices, where sensitive changes in each factor are represented by a factor-specific beta coefficient. The model-derived rate of return will then be used to price the asset correctly, the asset price should equal the expected end of period price discounted at the rate implied by the model. The price diverges should bring it back into line. Models for exchange rate determination imply an ambiguous effect of stock market liquidity defined in money aggregates, exchange rate, rapid money expansion in a country, stable demand for money, and depreciation of nominal exchange rate. Most models would predict that in the long run, an increase in a country's money growth would be reflected wholly on the price level with the latter offset by a depreciation of the exchange rate. This theory was developed by Ross (1976) and Roll and Ross (1995) provided a more intuitive explanation of the APT and discussed its merits for portfolio management While the macro variable model uses macroeconomic variables based on the economically interpretable effect on stock prices (Erdugan, 2012). The APT specifies returns as a linear function of more than a single factor. It predicts a relationship between the returns of a portfolio and the returns of a single asset through a linear combination of variables. The APT approach moved away from the risk versus return logic of the CAPM and exploited the notion of "pricing by arbitrage" to its fullest possible extent. As Ross (1976) has noted, arbitrage-theoretic reasoning is not unique to his particular theory but is the underlying logic and methodology of virtually all finance theories. There are many multifactor assets pricing models developed in the literature. According to Sinclair (1984), all of the multifactor asset pricing models developed in the literature can be treated as special theoretical cases of the APT. This theory will be used to assess credit risk and the financial performance of energy and petroleum firms listed at NSE in Kenya.

Neo-classical theory of interest was formulated in 1930 by Robertson & Ohlin. According to this theory, the demand and supply of loanable funds are what determine interest rates. This theory presents a more practical approach to interest theory as compared to other classical theories. In this theory, demand for loanable funds is determined by three factors; investment, hoarding, and dissaving. Investment demand is the main source of demand for loanable funds. New capital goods such as inventories form the broader class of investments. Any entrepreneur compares the expected returns to the rate of interest before making an investment decision. The demand for loanable funds and the rate at which investors are willing to have an inverse relationship (Saidu & Tumin, 2019). Hoarding, according to the theory, the demand for loanable funds is also determined by people who hold on to idle cash to meet their liquidity requirements. Finally, dissaving opposite to saving decreases interest rates because it occurs when people spend more beyond their income (Waseem & Abdul, 2018). This theory will be used to establish the effect of interest rate risk on the financial performance of energy and petroleum firms listed at NSE in Kenya

Conceptual Review

This is a diagram showing the linear relationships between independent factors (Liquidity Risk and Foreign Exchange Risk) and the dependent variable (Financial performance) as illustrated in figure 1.

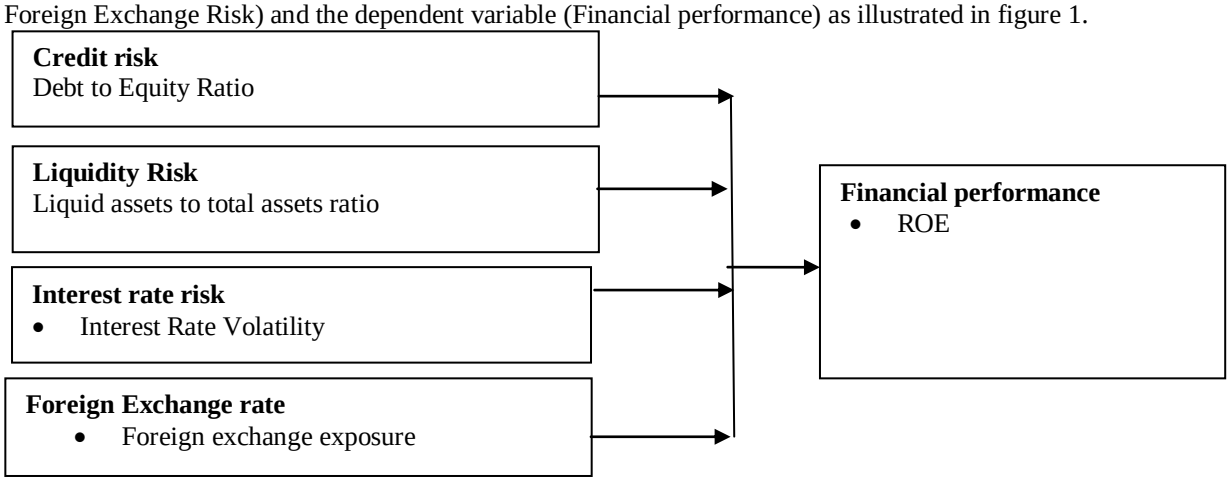

Figure 1.0: Conceptual Framework

Empirical Review

Liquidity Risk and Financial Performance

Wani and Ahmad (2016) conducted a study on liquidity risk and financial performance of the Indian insurance industry. As per the data, liquidity risk has a statistically significant positive association with the insurance industry's return on the asset in India. The research was carried out in Asia and focused on the insurance business; thus, the conclusions may not apply to Kenyan circumstances. Sohaimi, (2016) researched liquidity risk and performance of Malaysian banks. The results of the multiple regressions showed that liquidity risk affects banks' capital and reserve significantly, with the non-performing loan (NPLs), exacerbating the liquidity risk. They have a negative relationship with a deposit, cash, and liquidity gap. Isiaka (2018) investigated the impact of liquidity risk on the performance of Nigerian insurance businesses listed on the stock exchange. Multiple panel regression methods were used in the study. Leverage has a substantial negative impact on Return on Assets, according to the study's findings. The current ratio will be used as a measure of liquidity risk, while the Return on Equity will be used as a measure of performance. Musiega et al (2017) conducted a study on the influence of liquidity risk on the performance of commercial Banks in Kenya. Secondary data were used in the study. The findings were credit risk had a negative relationship with performance hence managers should aim at reducing this risk to increase performance for commercial banks in Kenya. Muriithi and Waweru (2017) conducted a study on Liquidity Risk and Financial Performance of Commercial Banks in Kenya. Findings indicate that NSFR is negatively associated with bank profitability both in the long run and short run while LCR does not significantly influence the financial performance of commercial banks in Kenya both in the long run and short run. However, the overall effect was that liquidity risk has a negative effect on financial performance.

***Foreign Exchange Rate Risk and Financial* Performance**

Bartov and Bodnar, (2014) conducted a study on the influence of the foreign exchange rate on the financial performance of commercial banks in Pakistan. The operating profitability of businesses with short foreign exchange positions was lower than the operating profitability of firms with long foreign exchange positions, according to an analysis of 30 firms done from the third quarter of 2012 through the second quarter of 2015. Mbithi (2016) conducted a study on the effect of foreign exchange rates on the financial performance of firms listed on the Nairobi securities exchange. From the findings, the study found that the listed firm's financial performance is affected by the foreign exchange rates movements. Use the income statement and the owner‘s equity account to record foreign exchange differences. The study further concluded that unrealized foreign vi exchange gains/losses affected the Net Income of listed companies as it was posted to either income statement or owners’ equity. According to Kent and Shapiro, (2015) researched on the overall goal of this research was to see how hedging foreign exchange risk affected the financial performance of non-banking firms listed on the Nairobi stock exchange. The researchers used multiple regression analysis to see how the hedging strategies influenced the firm's performance. The results indicated that non-financial businesses' performance would be 0.564 if all aspects were taken into consideration (internal hedging strategies, external hedging techniques,

inflation, and interest rates). Mugi (2017) conducted a study on the influence of foreign currency risk management methods on the performance of commercial banks in Kenya.

Credit Risk and Financial Performance

Isanzu (2017) conducted a study to examine the impact of credit risk on the financial performance of Chinese banks. Secondary data was collected from the five largest commercial banks in the country for the period of 7 years from 2008 to 2014. Data analysis was done using a balanced panel data regression model, and the study findings reveal nonperforming loans and Capital adequacy have a significant impact on the financial performance of Chinese commercial banks; therefore, the need to control credit risk is crucial for bank financial performance. Al-Eitan and Bani-Khalid, (2019) researched the impact of credit risk (CR) on the financial performance of Jordanian commercial banks listed on the Amman Stock Exchange, for the period 2008-to 2017. The results showed that CR has a negative and significant impact on return on assets (ROA) and return on equity (ROE). Further, the results indicated that CR (measured by the ratio of doubtful debts to total loans, non-performing loans, and loan losses to total loans) has a negative and significant impact on ROA, and ROE. While the total deposits and bank size have a positive and significant impact on the financial performance of these Jordanian commercial banks.

Zaidanin and Zaidanin (2021) conducted a study on the impact of credit risk management on the financial performance of the United Arab Emirates commercial banks. It is concluded from the regression outcomes that the non-performing loans ratio and cost-income ratio have a significant negative impact on commercial banks' profitability in the United Arab Emirates, while capital adequacy ratio, liquidity ratio, and loans-to-deposits ratio all have a very weak positive relationship on the return on assets but they are not determinants of bank's profitability due to the insignificant statistical impact on it. Afriyie (2016) examined the impact of credit risk on the profitability of rural and community banks in the Brong Ahafo Region of Ghana. The findings indicated a significant positive relationship between non-performing loans and rural banks' profitability revealing that there are higher loan losses but banks still earn profit. He found that there is a relationship between credit risk management and the profitability of selected rural banks in Ghana. Rural banks with a higher capital adequacy ratio can better advance more loans and absorb credit losses whenever they crop up and therefore record better profitability. Mutua (2016) investigated how credit risk management affects the financial performance of Savings and Credit Cooperatives (SACCOs). The study discovered a substantial link between the lending strategy in risk minimization and the financial success of these businesses. The debt-to-income ratio was employed as a measure of credit risk in this study, although Mutua did not (2016). It also included liquidity and operational risks to analyze the impact of financial risk on company performance, which Mutua's study did not include.

Interest Rate Risk and Financial Performance

Waseem and Abdul (2018) investigated the influence of interest rate changes on the profitability of four large Pakistan commercial banks. As a consequence, it is discovered that interest rates and commercial bank profitability have a strong and positive correlation. It indicates that when the value of the interest rate rises or falls, the value of a bank's profitability rises or falls as well. Saidu and Tumin (2019) investigated the performance and financial ratios of samples of four Malaysian and nine Chinese commercial banks from 2011 to 2017. The study found that the liquidity and size of the banks do not influence the performance of the banks in both countries. Kolapo and Dapo (2015) investigated the impact of interest rate risk on the performance of Nigerian deposit money institutions. Interest rate is viewed by banks as either the price of deposits or the cost of borrowing. Each measure of interest rate risk is determined to have an insignificant influence on bank performance using the fixed effect regression technique. Interest rate risk is also found to have a minimal influence on changes in return on assets, implying that it has little impact on bank performance. Odeke and Odongo (2014) investigated interest rate risk exposure and commercial bank financial performance in Uganda. The variation predicted maturity gaps, basis risk, and assets and liabilities margins, and explained 20.19 percent of the performance of commercial banks. Except for basis risk, the overall study of interest rate risk exposure and bank performance revealed a typically positive relationship. Ngumi and Ondigo (2014) investigated the impact of lending interest rates on deposit-taking microfinance firms' financial performance in Kenya. As a result, data from nine DTMs were examined using a multivariate regression model for five years (2009-2013). According to the findings, there is a substantial positive link between lending interest rates and DTM financial success.

III. Material And Methods

The study used quantitative research and a descriptive research design. The process of collecting and analyzing numerical data is known as quantitative research. Descriptive research aims to describe a population, situation, or phenomenon systematically and accurately. It can answer the questions of what, where, when, and

how, but not why. The population for this study was all four energy and petroleum companies listed on the Nairobi Securities Exchange namely Total energies, Umeme, Kenya Power Lighting Company, and Kenya Electricity Generating Company. The study was conducted over 5 years; between 2016 and 2020. The study involved the collection of secondary data from all the energy and petroleum firms listed at NSE Kenya. The financial statements were obtained for 5 years from 2016 to 2020 from the NSE website. The panel data comprised cross-section and time-series data. The four energy and petroleum firms listed at NSE in Kenya namely Total energies, Umeme, Kenya Power Lighting Company, and Kenya Electricity Generating Company comprised the cross-section data while the five-year period from 2016 to 2020 is time-series data. Panel data was used. The data was coded and then imported into STATA software for analysis. The four energy and petroleum firms listed at NSE in Kenya formed the panels for the data. The data contained columns for credit risk, liquidity risk, interest rate risk, foreign exchange rate risk, and financial performance. The panel regression model was used in the present study to model the linear association between explanatory dependent (financial performance) and independent variables (liquidity risk and foreign exchange rate risk). The Panel regression analysis was used in the present research for several reasons: to determine the relationship between each element under investigation and determine the relationship between dependent and independent variables (Russell, 2013).

IV. Result and Discussion

Descriptive Analysis

Descriptive statistics are a category of statistics that primarily describe the features and characteristics of a data set. It includes frequency distribution, percentage as a proportion of the population, measures of spread as well as measures of central tendency. Descriptive statistics in this study were computed to describe the overall distribution of the collected data. The study computed their mean, standard deviation, and minimum and maximum Values. Table 1 presents the findings obtained.

Table 1.0: Descriptive Statistics

Variable	Obs	mean	Std.Dev	Min	Max
CR	20	1.42434	0.6367609	0.2383	2.3194
LR	20	5.159485	2.527591	0.5561	9.2046
IR	20	2.596305	1.10493	0.356	4.2349
FX	20	4.447555	1.817604	0.6293	6.9344
ROE	20	5.853265	4.141193	0.6465	14.2072

From the findings in Table 4.1, it is seen that on average, the four energy companies listed on the Nairobi Securities Exchange recorded an average credit risk ratio of 1.4243. The minimum ratio recorded was 0.2383 and the maximum value was 2.3194. The standard deviation value of 0.6367 is small which suggests that the ratios recorded by individual companies over the five years did not deviate much from the mean value. The average liquidity risk ratio is 5.1594. The minimum ratio recorded over the five years was 0.5561 and the maximum value was 9.2046. This is an indication that there was a large difference between individual liquidity risk ratios recorded by individual companies as indicated by a large standard deviation of 2.5275.

On average, the four energy companies recorded an average interest rate risk of 2.5963 as shown in Table 4.1. The minimum interest rate risk recorded was 0.356 and the maximum ratio was 4.2344. The findings also showed that the standard deviation was 1.1104 which is slightly small an indication that the individual ratios recorded by the four companies over the five years had a slight deviation from the mean value. Average Foreign Exchange Rate Risk of 4.4475. The minimum ratio recorded was 0.6293 and the maximum value was 6.9344. The findings also show that the standard deviation was small (1.8176<2). This suggests that the individual Foreign Exchange Rate Risk ratio recorded by the companies between 2016 and 2020 did not have a very large deviation from the mean value. This study measures the Financial Performance of energy companies using Return on equity (ROE). The average return on equity of the four energy companies was 5.8532. The findings also show that the minimum ratio recorded was -0.6465 and the maximum ratio was 14.2072. This suggests that there are companies that recorded profit while others made losses. There was a huge difference between means and the individual ratios recorded by the companies over the five years as indicated by a large standard deviation value of 4.1419

Inferential Analysis

Stationarity Test

This study applied the ADF test. ADF tests the null hypothesis that the data has a unit root. If the P-value is less than a 5% level of significance, then the null hypothesis was rejected, implying stationarity.

However, if the P-value is higher than a 5% level of significance, then the null hypothesis is accepted, implying non-stationarity. The study tested for the stationarity of each variable.

Table 2.0: Augmented Dickey-Fuller Test for Unit Root

dfuller LR ,Lags (1)

Augmented Dickey-Fuller test for unit root number of obs = 18

Interpolated Dickey Fuller

Z(t)	Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value
Liquidity Risk	-10.343	-3.461	-2.88	-2.570
Credit Risk	-10.217	-3.461	-2.88	-2.570
Interest Rate Risk	-10.174	-3.461	-2.88	-2.570
Foreign Exchange Rate Risk	-11.768	-3.461	-2.88	-2.570
ROE	-10.118	-3.461	-2.88	-2.57

Mackinnom approximate p-value for Z(t) = 0.0000

The findings show that the p-value for each variable was 0.000 which is less than the selected level of significance (0.05). The study, therefore, accepts the null hypothesis and concludes that data on credit risk, liquidity risk, interest rate risk, foreign exchange risk, and financial performance were stationary. This implies that the fitted data would not produce spurious models.

Hausman Test

Hausman specification test was employed in the detection of endogenous repressors in a regression model. For OLS regression to be computed, the data assumes that there is no correlation between independent variable and the error term. The null hypothesis was rejected if the value of P is less than the significant level (0.05), meaning that the used data is not from a normal population. The presence of endogenous repressors in a regression model may cause failure in the estimators of OLS. To decide between fixed or random effects a Hausman test was conducted where the null hypothesis was that the preferred model is random effects, that is if the Prob>chi2 value was greater than 0.05. The alternative the fixed effects if the Prob>chi2 value was less than 0.05. It basically tested whether the unique errors (ui) are correlated with the regressors.

Table 3.0: Hausman Specification Test

```
. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |    fixed        random       Difference          S.E.
-------------+------------------------------------------------------------
          X1 |   .0014981     .0020005       -.0005024        .0011812
          X2 |  -.0009897     .0009219       -.0019117        .0017254
          X3 |  -.0012513    -.0006014       -.0006499        .0012197
          X4 |   .0039354     .0008063        .0031291        .0022211
------------------------------------------------------------------------------

                           b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

                  chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =         4.71
                Prob>chi2 =       0.3178
```

Since the Prob>chi2 value (0.3178) was greater than 0.05 a random effect was preferred and conducted. The findings were in agreement with Green (2018) that the null hypothesis for the test is that the random effect model is preferred to fixed effect model and is to be rejected if the p value is less than 5% to imply that fixed model is preferred.

Correlation Analysis

The study computed Spearman correlation analysis to establish the strength and the direction of the relationship between the dependent and the independent variables. The findings were as presented in Table 4.0.

Table 4.0: Correlation Analysis

	ROE	CR	LR	IR	FX
ROE	1.000				
CR	-0.856	1.000			
	0.000				
LR	-0.805	-0.258	1.000		
	0.01	0.177			
IR	-0.895	0.325	-0.357	1.000	
	0.004	0.258	0.014		
FX	-0.855	0.248	-0.196	0.563	1.000
	0.009	0.245	0.186	0.089	

From the findings in Table 4.0, credit risk and financial performance of energy firms listed at NSE in Kenya have a strong relationship (r= -0.856). The relationship was significant at a 5% level of significance since the p-value (0.000) was less than the selected level of significance (0.05). This agrees with Chen (2016) that a good understanding of risk determinants within the industry of operation will provide valuable information that will allow business managers and investors to adopt wise investment strategies. Therefore, when credit risk is kept at a minimum, through proper knowledge business performance will increase, The findings also show that the findings show that liquidity risk and financial performance of petroleum firms listed at NSE in Kenya were strongly and negatively correlated (r= -0.805). The relationship was significant since the p-value (0.010) was less than the selected level of significance (0.05). This is in line with the findings of Tabari *et al.* (2013) that poor management of liquidity risk negatively affected performance. Therefore, firms with limited liquidity will always experience funding shortfalls.

On interest rate risk, the findings showed that there is a strong relationship between interest rate risk and the financial performance of energy and petroleum firms listed at NSE in Kenya (r= -0.895). The influence was significant since, at a 95% confidence interval, the p-value (0.004) was less than the selected level of significance. The findings agree with the findings of Hoffman, Langefield, Pierobon, and Vuillemey (2018) that high levels of interest rates tend to hurt financial institutions in fixed-rate economies and nonfinancial companies in variable-rate economies. Finally, foreign exchange risk is seen to have a strong relationship with the financial performance of energy firms listed at NSE in Kenya (r= -0.855). The relationship is considered to be significant since the p-value (0.000) was less than the selected level of significance (0.05). This concurs with Simakova (2017) that the undervaluation of local currency led to a decline in the company's stock returns. Undervaluation of local currencies moved company stock prices to higher levels in the various countries under investigation. Local currency depreciation positively affected the volume of exports while at the same time increasing the cost of importing commodities from other countries. This shows that change in foreign exchange risk will affect company performance.

Regression Analysis

The study computed regression analysis to test the influence of credit risk, liquidity risk, interest rate risk, foreign exchange rate risk, and financial performance of energy and petroleum firms listed at NSE in Kenya. The findings were also used to test the research hypothesis. Table 5.0 presents the model summary and the ANOVA findings.

Table 5.0: Model Summary and Analysis of Variance

SOURCE	SS	DF	MS	
MODEL	324.5358	4	81.13396	Number of obs=20
RESIDUAL	1.420426	15	0.946951	F(4,15)=856.79
TOTAL	325.9563	19	17.15593	Prob>F=0.00
				R-squared=0.9956
				AdjR-squared=0.9945
				Root MS=.30773

The model summary findings were used to show the amount of variation in the dependent variable that can be explained by changes in the independent variable. From the findings in Table 5.0 above, the value of the adjusted R-squared is 0.9945 which suggests that 99.45% variation in the financial performance of energy and petroleum firms listed at NSE in Kenya can be explained by credit risk, liquidity risk, interest rate risk, and foreign exchange rate risk. The findings further showed that f statistic F(4,15 = 856.79) was greater than the f

critical value from the f-distribution tables (3.056). The findings further showed that the p-value (0.000) was less than the selected level of significance (0.05). This suggested that the model was significant and that the variables credit risk, liquidity risk, interest rate risk, and foreign exchange rate risk are significant predictors of the financial performance of energy firms listed at NSE in Kenya. To further understand the influence of each variable, the coefficients table was computed. Table 6.0 presents the findings.

Table 6.0: Regression Coefficients

From the coefficients table above, the following regression model was fitted;

ROE	COEF.	Std.Err	t	p>|t|	(95%Conf.	Interval)
LR	-0.33086	0.076819	-4.31	0.000	-0.48217	-0.17955
CR	-2.47444	0.192802	-12.83	0.000	-2.8542	-2.09468
IR	-1.64313	0.151607	-10.84	0.000	-1.94174	-1.34451
FX	-0.18643	0.008895	-2.1	0.000	-0.03616	-0.00112
Cons	15.73649	0.09292	169.36	0.000	15.55347	15.91951

$$\mathbf{Y = 15.7364 - 2.4744X_{1it} - 0.3308X_{2it} - 1.6431X_{3i\,t} - 0.0186X_{4it}}$$

The regression equation above shows that when all the variables (credit risk, liquidity risk, interest rate risk, and foreign exchange rate risk) are held to a constant zero, financial performance of energy firms listed at NSE in Kenya will be at a constant value of 15.07364. The findings also show that credit risk has negative influence on financial performance of energy firms listed at NSE in Kenya (β= -2.4744). Also, the influence was found to be significant since the p-value (0.000) was less than the selected level of significance (0.05). This meant that credit risk had negative significant influence on financial performance of energy firms listed at NSE in Kenya. The study therefore concluded that credit risk has significant influence on financial performance of energy firms listed at NSE in Kenya. The findings of the study agrees with Alshatti (2015) who established positive and insignificant impact of NPL on both ROA and ROE; negative and significant effect of total debt to total equity ratio on both ROA and ROE and CAR has no influence on both ROA and ROE. Therefore, large debt increases debt services and liabilities attracting more financial risk which may adversely affect performance.

The findings also showed that liquidity risk has negative influence on financial performance of energy firms listed at NSE in Kenya (β= -0.3308). The influence was also seen to be significant since the p-value obtained (0.000) was less than the selected level of significance 0.05. This meant that liquidity risk has negative significant influence on financial performance of energy and petroleum firms listed at NSE in Kenya. These study findings agrees with the findings of Laminfoday (2018) that liquidity risk had a negative and significant impact on return on asset. Failure to identify and check liquidity risk may lead a company into many financial problems including inability to meet clients' demands and pending financial obligations which would put the company's performance prospects in jeopardy.

In addition, interest rate risk was found to have negative influence on financial performance of energy and petroleum firms listed at NSE in Kenya (β= -1.6431). The findings also showed that the influence of interest rate risk on financial performance was significant since the p-value (0.000) was less than the selected level of significance (0.05). This implied that interest rate risk has negative significant influence on financial performance of energy and petroleum firms listed at NSE in Kenya. These findings concur with the findings of Ali and Nsenje (2017) that volatility in exchange rate had significant effect on profitability. It also agrees with Hoffman, Langefield, Pierobon and Vuillemey (2018) that high levels of interest rates have a tendency to hurt financial institutions in fixed-rate economies and nonfinancial companies in variable rate economies.

Finally, the findings showed that foreign exchange rate risk has a negative and significant influence on financial performance of energy and petroleum firms listed at NSE in Kenya (β= -0.0186). The influence was also found to be significant since the p-value obtained (0.037) was less than the selected level of significance (0.05). This implied that foreign exchange rate risk has negative significant influence on financial performance of energy and petroleum firms listed at NSE in Kenya. The findings agrees with Simakova (2017) who revealed a negative association between exchange rate and share value; undervaluation of local currency led to a decline in the company's stock returns. The increased ratio of debt denominated in foreign currency leads to high company exposure to foreign exchange volatilities. Undervaluation of local currencies moves company stock prices to higher levels in the various countries under investigation. Local currency depreciation positively affected the volume of exports while at the same time increased the cost of importing commodities from other countries.

V. Conclusion and Recommendation

The study findings showed that credit risk has negative influence on financial performance of energy and petroleum firms listed at NSE in Kenya. The study therefore concluded that credit risk has negative significant influence on financial performance of energy and petroleum firms listed at NSE in Kenya. The study found liquidity risk has negative influence on financial performance of energy and petroleum firms listed at NSE in Kenya. The study therefore concludes that liquidity risk has negative significant influence on financial performance of energy and petroleum firms listed at NSE in Kenya. The study findings showed that interest rate risk has negative influence on financial performance of energy and petroleum firms listed at NSE in Kenya. Based on these findings the study concluded that interest rate risk has negative significant influence on financial performance of energy and petroleum firms listed at NSE in Kenya. The findings showed that foreign exchange rate risk has a negative and significant influence on financial performance of energy and petroleum firms listed at NSE in Kenya. From these findings, the study concludes that foreign exchange rate risk has negative significant influence on financial performance of energy and petroleum firms listed at NSE in Kenya.

The study recommends energy and petroleum firms to embrace effective credit risk systems that have a suitable credit risk environment operating under a sound credit administration that involves monitoring and proper credit risk controls; this would help in minimizing possibilities of firm failure. Also, the companies should engineer effective strategies to address credit risk issues carefully this is because poorly designed credit risk policies would compromise asset quality and expose the company to financial distress. The study recommends energy and petroleum firm in Kenya to ensure they maintain optimal liquidity to ensure organizational efficiency and effectiveness and upholding of good relations with stakeholders. The companies should also embrace properly established system that would assist them in identifying sources of financial risk and therefore protect firm value. The study also recommends energy and petroleum firms to move their focus on interest rate risk policies and practice and direct their efforts to prudent monitoring of the assets and liabilities mismatch positions in order to help control the effect of changes in interest rates. The study further recommends energy firms to immunize themselves against variability in interest rate sensitivity of their assets and liabilities, through proper financial risk that manage to keep the interest rate risk within prudent levels. The study recommends the government through Central Bank of Kenya to take necessary steps to increase the value of domestic currency; this will help to safeguard the profitability of the energy firms. The study also recommends development of appropriate monetary policy, ones that can reduce inflation which is the main reason causing foreign exchange to fluctuate.

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