



## **Risk Management and Shareholders Wealth Maximization among Listed Pharmaceutical Companies in Nigeria**

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### **Abstract**

This study examined Risk Management and Shareholders Wealth Maximization among Listed Pharmaceutical Companies in Nigeria. Specifically, the study examined the relationship between operational risk, liquidity risk, market risk, leverage and shareholders wealth maximization in the pharmaceutical sector in Nigeria. Multiple regression estimation approach was employed on information extracted from a sample consisting of six (6) pharmaceutical companies quoted on the Nigerian Exchange Group between the period of ten (5) years (2017 to 2021). Panel Least Square (PLS) regression technique was employed in estimating the data and testing the formulated hypotheses. The findings revealed that there is an insignificant relationship between operational risk, liquidity risk, market risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria. The results also uncovered that there is a significant relationship between leverage and shareholders wealth maximization in the pharmaceutical sector in Nigeria. In line with the findings, the study recommends that the management of listed pharmaceutical companies in Nigeria should put adequate resources in place that will enable them understand operational risk so as to guarantee effective operational risk management in order to enhance shareholders wealth maximization. It is also recommended that an appropriate debt- equity mix should be adopted by listed pharmaceutical companies in Nigeria if they must improve their shareholders wealth maximization and remain competitive

**Keywords:** Operational Risk, Liquidity Risk, Market Risk, Leverage, Shareholders Wealth Maximization.

## **Introduction**

The fundamental and traditional objective of business organizations is maximization of shareholders' wealth (Oladipupo & Okafor, 2006). All activities of the organizations are geared towards achieving this objective (Oladipupo & Okafor, 2006). Theophilus and

Ademola (2020) opined that shareholders wealth maximization hypothesized that the immediate financial objective and crucial aim of public corporations is and should be to maximize returns to shareholders. Nwaobia and Ajayi (2020) disclosed that wealth maximization had always

been the desire of every potential investor and shareholders of listed companies seem to be motivated to make investment decisions based on this expectation. Shareholders' wealth maximization is the measure of the level of profitability of the ordinary shareholders' investment and a reflection of the competencies of the managers in utilizing the available resources for value creation. It is defined by the relationship between profit after tax and the number of common shares outstanding (Nwaobia & Ajayi, 2020).

Shareholders' wealth maximization is enhanced when an effective and pragmatic risk management model is implemented and adopted in the system from top to bottom level of management (Ogundajo, Adefisoye & Nwaobia, 2020). Temile, Enakirerhi, Felix and Jatmiko (2019) disclosed that risk management is the process that aims at helping organizations to understand, and take action on all their risks with a view to increasing the probability of success and reducing the likelihood of failure.

Firms face different kind of risks in their daily operations and the manner in which they deal with them greatly influences their performance. Risk in financial terms is usually defined as the probability that the actual return may differ from the expected return (Otieno, 2020). Fatimehin (2022) opined that the Nigeria business environment is examined to be unfriendly with reference to uncertainties in political regimes, cyber security risks, the demographic structure, the economic situation, falling oil and gas prices and geopolitical conflicts. In view of this, management of companies cannot afford to manage risks casually, especially in this era of constantly changing innovation and technological developments. Consequently, enterprise risk management is adopted as a strategic tool structured to help management to respond to impending risks and management uncertainties using an integrated and all-inclusive approach (Fatimehin, 2022).

According to Ogundajo, Adefisoye and Nwaobia (2020) some of the risks associated with corporate organizations include operational risk, liquidity risk, market risk, leverage among others. Muthia, Ghasarma, Andaiyani and Setiawan (2019) opined that among other risks, operational risk is considered to be more complex as it involves many aspects in an organization and also impacted by many factors. Muthia, Ghasarma, Andaiyani and Setiawan (2019) buttressed that operational risk is integral to all business process compared to liquidity risk that is tend to be specific to one business area. Ghasarma, Andaiyani and Setiawan (2019) described operational risk as the risks caused by the failed internal process, people and systems. Meshack and Mwaura (2016) disclosed that operational risk may tangibly manifest itself in the likes of business disruption, control failures, errors, misdeeds or external events. Meshack and Mwaura (2016) buttressed that operational risk can be divided from into those losses that are expected and those that are unexpected. Operational risk is not a new risk, but hard evidence suggests that this risk is significant and maybe growing, virtually every catastrophic corporate loss that has taken place during the past twenty (20) years. Operational risks affect client satisfaction, organization's reputation and its relationship with its stakeholders thereby reducing shareholder value. It increases volatility of operating costs and earnings (Anetoh, Nwadiolor, Anetoh & Okeke, 2021).

Liquidity on the other hand, points out to the ability of firms in paying back their short term liabilities (Yameen, Farhan & Tabash, 2019). It plays an important role in smoothening all operations of a firm. The importance of liquidity to the performance of a company might determine the level of shareholders wealth maximization of a company. Liquidity is a prerequisite for a firm as it shows its ability for meeting its short-term obligations (Yameen, Farhan & Tabash, 2019).

Market risk is a risk where the value of a firm's financial instrument fluctuates due to volatility in its market price, with less consideration of whether these changes are caused by factors that relate to individual instruments or that of their issuer (counter-party), or by factors relating to all the instruments traded on the market (Noor, Njeru & Muoria, 2017). Market risk is a situation where a firm experiences losses due to factors affecting overall performance of the financial markets. Market risk cannot be

eliminated through diversification it can only be controlled through hedging (Noor, Njeru & Muoria, 2017).

Onifade, Momoh and Ajulo (2021) explained that leverage is utilized to determine the quantity of monetary resources corporate organization need to consider the structure of corporate organization that aspire to maximize shareholders wealth.

In this regards, this study examines risk management and shareholders wealth maximization among listed pharmaceutical companies in Nigeria.

Empirically, several studies have so far conducted on risk management in Nigeria and the world over; for example, Fatimehin (2022), Anetoh, Nwadiolor, Anetoh and Okeke (2021), Okpala, Ifurueze and Ofor (2021), Ogundajo, Adefisoye and Nwaobia (2020), Fadun and Oye (2020), Otieno (2020), Meshack and Mwaura (2016), among others.

Therefore, having carefully looked at these previous studies, we found that none of the abovementioned studies focus on pharmaceutical sector in Nigeria, therefore absence of empirical studies on pharmaceutical sector in Nigeria provided a gap that needed to be filled, hence the need for this study. Against this backdrop, the following research objectives are raised:

The main objective of this study is to examine risk management and shareholders wealth maximization in the pharmaceutical sector in Nigeria, while the specific objectives are to determine the relationship between operational risk, liquidity risk, market risk, leverage and shareholders wealth maximization in the pharmaceutical sector in Nigeria.

## **Literature Review**

### **Concept of Shareholders Wealth Maximization**

The shareholder's wealth maximization measures the amount of profit for the period available to the owners as the residual returns resulting from the operational activities during the period under consideration (Nwaobia & Ajayi, 2020). Studies had measured the performance of expected returns due to the equity providers of fund using shareholder's wealth maximization (Kapellas & Siougle, 2017). Liu and Sun (2017) opined that shareholder's wealth maximization is a suitable performance evaluation technique to ascertain the productiveness of the managers saddled with the responsibility of piloting the affairs of the company and a good parameter to measure the amount of return on ordinary shareholder's investment based on current period's performance (Fayed & Dubey, 2016).

According to Bankole, Ukolobi and McDubus (2018) maximizing shareholders' wealth has always been a focus for all companies as a precedence among other corporate issues like corporate social responsibilities. Bankole, Ukolobi, McDubus (2018) posited that shareholder wealth is the projected future earnings to the firm owners calculated in their present value. These projected future earnings are usually in the form of dividends distributed periodically and proceeds from the trading of share. They also highlighted that dividends are paid to ordinary shareholders out of corporate profits.

### **Risk Management**

The concept of risk management does not have a generally accepted definition. Ojo (2019) defined risk management as the process of planning, organizing, directing, and controlling resources to achieve given objectives when surprisingly good or bad events are possible.

Bayyoud and Sayyad (2015) defined risk management system as, "all of the mechanisms concerning the process of standard setting, reporting, verifying the compliance with standards, decision-making and implementing, which are established by the board of directors in order to monitor, to keep under control and, if necessary, to change the risk/return structure of the future cash flows of the bank and, accordingly, the quality and the extend of the activities" The definition highlights on the key function

of risk management i.e. to control the risk or return structure of future cash flows. It can be analyzed that financial sector operates in the highly volatile market with foreign exchange fluctuations. In Nigeria, risk management disclosure is regulated by Nigerian Code of Corporate Governance (NCCG) of 2018. The code recommended that there shall be adequate disclosure on firms' risk management based on financial risk, strategic risk, operational risk, empowerment risk and technological risk in the corporate reporting (Okpala, Ifurueze & Ofor, 2021).

### **Components of Risk Management**

#### ***Operational risk***

Operational risk is the risk of loss resulting from ineffective or failed internal processes, people, systems, or external events that can disrupt the flow of business operations (Fatimehin, 2022). Operational risk can be viewed as part of a chain reaction: overlooked issues and control failures, whether small or big lead to greater risks materialization, which may result in an organizational failure that can harm a company's bottom line and reputation. While operational risk management is considered a subset of enterprise risk management, it excludes strategic, reputational, and financial risk (Fatimehin, 2022).

Operational risks arise from inadequate or failed internal processes, people and systems, or from external events. They include: fraud, security failure, legal breaches, physical (e.g. infrastructure failure) or environmental risks (Chukwunulu, Ezeabasili & Igbodika, 2018). Operational risks affect client satisfaction, organization's reputation and its relationship with its stakeholders thereby reducing shareholder value. It increases volatility of operating costs and earnings (Anetoh, Nwadiolor, Anetoh & Okeke, 2021).

The importance of operational risk management cannot be overemphasized (Fadun & Oye, 2020). Effective operational risk management will help corporate organizations to identify all the risks that they are exposed to, including those that they do not have the expertise or experience to manage, thereby helping them to put frameworks in place to reduce such risks and the associated impact if it crystallizes which in turn makes them less vulnerable to systemic problems (Fadun & Oye, 2020).

#### ***Liquidity Risk***

Liquidity is a ratio that aims to measure a company's ability to meet its short-term obligations (Reschiwati, Syahdina & Handayani, 2019). A company that has high liquidity means that it can pay the short-term debt, so it tends to reduce total debt, which in turn capital structure will be smaller, so it can be said that liquidity affects the capital structure (Reschiwati, Syahdina & Handayani, 2019).

Liquidity risk is the type of risk which may arise from the fact that the firm may find it difficult to generate enough quantum of funds with which short-term financial obligations can be met (Ayodele & Alabi, 2014). Liquidity risk is the most often thought of as a sudden liability short fall that is associated with a deposit withdrawal or with a decline in borrowing capacity (Ayodele & Alabi, 2014).

Liquidity risk is the risk stemming from the lack of marketability of an investment that cannot be bought or sold quickly enough to prevent or minimize a loss (Noor & Abdalla, 2014). It is the risk that a given security or asset cannot be traded quickly enough in the market to prevent a loss (or make the required profit) (Noor & Abdalla, 2014).

#### ***Market Risk***

Market risk is the risk that a firm will incur losses because of a change in the price of assets held resulting from changes in interest rate, securities, commodity prices, foreign exchange rate and other market risk factors (Odubuasi, Oshilim & Ifurueze, 2020). Ekinci (2016) upholds that market risk is the

risk of losses in liquid portfolio arising from the movements in market prices and consisting of interest rate, foreign currency, equity and commodity price risks. In the words of Ekinci (2016) and Namasake (2016), market risk exposure is more volatile than credit risk exposure because of rapid changes in market condition that can cause severe financial losses and possible collapse.

The risk of a change in the value of a company's financial position is referred to as market risk and which results to changes in the value of the underlying components like stock price, commodity prices and others (Ogbeiwi & Okoughenu, 2020). The adverse price fluctuation on equity as it affects the economic value of an asset is explained by market risk Yousfi (2014). Importantly, various alternative measures of market risk have been utilised by some studies which includes book-to-market, gearing ratio, financial leverage and many others (Ogbeiwi & Okoughenu, 2020).

### ***Leverage***

Leverage could be described as a corporate policy of utilizing loan to enhance corporate investment and performance (Ofulue, Ezeagba, Amahalu & Obi, 2022). Ofulue, Ezeagba, Amahalu and Obi, (2022:173) also refers to "leverage as the amount of debt a firm uses to finance assets. Leverage results from using borrowed capital as a funding source when investing to expand the firm's asset base and generate returns on risk capital."

Leverage is defined as the quantity of debts corporate organizations employs to acquire assets, increase corporate performance, establish or purchase a new company (Igbal & Usman, 2018). Leverage could be described as the ability of an organization to utilized the assets or funds that a fixed load to augment the degree of earnings for corporate owner (Onifade, Momoh & Ajulo, 2021). Leverage is utilized to determine the quantity of monetary assets organization required to consider the structure of a company who aspire to boost revenue (income). Onifade, Momoh and Ajulo (2021:25) opined that "there are two kinds of leverage namely: operating leverage and financial leverage. Operating leverage demonstrate the use of fixed operating costs by the company in respect of company investment activities, while financial leverage emphasizes the use of funds from debt or issue preferred stock. The use of these funds raises fixed costs which can be either interest or dividends".

### **Theoretical Framework**

The study is underpinned on the shareholder theory.

#### ***Shareholder Theory***

Milton Friedman propounded the shareholder theory in 1970. He opined that the objective of most businesses is to increase shareholders' interest. As pointed out by Baah, Agyapomaa, Elikplimi, and Alexander (2018) the emphasis of the shareholder theory is on the maximization of shareholder's value. The shareholder theory is also premised on the fact that managers are hired as agents by shareholders to operate a business in their interest, thus empowering them legally and morally to act on their behalf. The shareholder theory is opined to be associated with ancient business methods; it is also greatly criticized. One of the criticisms is that it solely focused on shareholder's interest which contradicts the interest of other people in the same business (Green, 1993).

The study adopted both the shareholders' theory and the value at risk theory because, while the shareholders' theory is associated with shareholders' wealth maximization, the value at risk reflects the risk inherent in every investment and expects every investor to analyze the possible risk associated with investment. Although, the shareholders expect much from their investment, yet should realize that the inherent risk in corporate organizations can only be managed and cannot be out-rightly whisked away

(Ogundajo, Adefisoye & Nwaobia, 2020). Consequently, both theories reflect the ideology of the relationship between risk management and shareholders' wealth maximization.

### **Empirical Review**

Fatimehin (2022) examined the effect of risk management on the performance of listed consumer goods firms in Nigeria. Longitudinal panel research design was adopted in this study. The population of the study consists of all the twenty-seven (27) listed consumer goods firms on the Nigeria Stock Exchange as at 31st December 2021. In order to arrive at the sample size, the purposeful sampling technique was employed. As a result of the criterion ten (10) firms meet the requirement to form the sample size of the study. The study ranges from 2012 to 2021 a period of ten years. The secondary data adopted in this study were gathered from financial statements published on the Nigeria Exchange Group Plc and the individual company's financial statements. The study employed descriptive statistics and panel regression with the help of STATA version 13. The study found that operational risk has no significant effect on financial performance of listed consumer goods firm in Nigeria.

Anetoh, Nwadiolor, Anetoh and Okeke (2021) investigated the effect of credit and operational risks on firm value of listed deposit banks in Nigeria. The study adopted an ex-post facto research design. The target population of the study was all the deposit money banks listed in Nigeria Stock Exchange. The study used secondary sources of data from Central Bank of Nigeria as well as from annual reports and financial statement of accounts of deposit money banks under review from 2010 – 2019. The Structural Equation Modeling was used to test the formulated hypotheses at 5% level of significance. The findings showed that operational risk had a significant and positive effect on firm value of deposit money banks in Nigeria.

Ogundajo, Adefisoye and Nwaobia (2020) investigated the risk management and shareholders' wealth maximization. An ex-post-facto study of 100 firm-year observations was conducted using ten listed Deposit Money banks in Nigeria for a period of 10 years from 2009 to 2018. The results of the multiple regression analysis carried out revealed that risk management significantly affected shareholders' wealth of listed banks. Operating efficiency risk (OPER) had significant negative effect on Market Value (MV).

Fadun and Oye (2020) analyzed the impact of operational risk management practices on the financial performance of commercial banks in Nigeria. 10-years (2008 - 2017) secondary data extracted from audited financial statements of selected commercial banks in Nigeria were used for the study. The data was analyzed using the Linear Multiple Regression Model. The results showed that there is a positive relationship between operational risk management and the financial performance of banks. The findings revealed that sound operational risk management practices impact positively on the financial performance of banks.

Muthia, Ghasarma, Andaiyani and Setiawan (2019) investigated the effect of operational risk on profitability in Islamic banks. The total of 14 Islamic banks in Indonesia for the period of 2016-2018 was selected to be the sample of this study. The findings show that the appropriate model in this study is Pooled OLS model and operational risk, which is measured by cost to total asset, is found to be positively related to profitability.

Bayunanda, Ompusunggu and Ak (2018) investigated the relationship between debt-to-equity ratio and earnings management among listed manufacturing companies in Indonesia Stock Exchange from 2010 – 2016. The study utilized purposive sampling technique to selected forty-seven (47) companies, which made up the study sample size. Based on the quantitative nature of the study, multiple regression was utilized in estimating the data generated for the purpose of the study with the aid of SPSS 25. The study revealed that debt-to-equity ratio is statistically insignificant in relation to earnings management.

Noor, Njeru and Muoria (2017) assessed market risk effects on performance of transport firms in Mombasa County. The study employed triangulation (Mixed of quantitative and qualitative) research design. The target population of this study was 2013 transport firms and the sample size was 172 firms arrived at through stratified and purposive sampling methods. The questionnaire was the primary data tool. The study found out that market risk has significant effects on financial performance of transport firms in Kenya.

**Methodology**

**Data Analysis Techniques**

This study shall employ the use of the Panel Least Square (PLS) analysis technique which entails the use of the fixed-effect model and random effect model to ascertain the causal relationship that exists between these variables. The Hausman test shall be utilized for this study due to the panel analysis that will be carried out which shall make reference to two models the fixed effect model and the random effect model. This test shall be carried out to select between these models

The study adopts a correlation research design. Secondary data was obtained from financial statements of selected pharmaceutical companies quoted on the Nigerian Stock Exchange.

The population of this study comprises of all the eight (8) pharmaceutical companies quoted on the floor of the Nigerian Stock Exchange as at December, 2021.

A total of six (6) pharmaceutical companies quoted on the Nigerian Stock Exchange form the sample size of this study. The convenient sampling technique was utilized in selecting each of the companies. However, the choice of the sample size was based on the availability of data for all the variables included in the model (in all the proposed years to be studied). The study covered a period of five (5) years (2017 – 2021).

**Model Specification**

To investigate risk management and shareholders wealth maximization, the study adopted and modified the model of Ogundajo, Adefisoye and Nwaobia, (2020). The model in their econometric form is given below:

The functional equation was developed as:

$$Y = f(X)$$

Where:

Y = Dependent Variable: Shareholders’ Wealth (SHWM).

X = Independent Variable: Risk Management (RM).

$$MV_{it} = \alpha_0 + \alpha_1 NPLR_{it} + \alpha_2 CAR_{it} + \alpha_3 OPER_{it} + \alpha_4 LQR_{it} + \varepsilon_{it} \dots \dots \dots \text{equation (1)}$$

Where:

Y= Market Value.

x<sub>1</sub> = Credit risk (CR) measured as non- performing loan to total loan ratio (NPLR).

x<sub>2</sub> = Capital risk (CAR) measured as capital adequacy ratio (CAR).

x<sub>3</sub> = Operational Efficiency Risk (OPER) measured as operating risk expenses ratio.

x<sub>4</sub> = Liquidity Risk (LQR) measured as liquidity ratio.

α<sub>0</sub>= constant; ε = error term; i = Entity; t = Time

However, the study adapt the work of Ogundajo, Adefisoye and Nwaobia, (2020) by removing two (2) variables such as Credit risk (CR) and Capital risk (CAR) and employing two (2) additional variables such as Market Risk (MKRK) and Leverage (LEV) in order to deepen the scope due to the peculiarity of the region under investigation. Therefore the regression model is specified below:

In a functional form, we have

$$SHW = f(OPRK, LIQR, MKRK, LEV) \quad \dots \text{eq. 1}$$

This can be re-specified in regression form as:

$$SHW_{it} = a + \beta_1 OPRK_{it} + \beta_2 LIQR_{it} + \beta_3 MKRK_{it} + \beta_4 LEV_{it} + e_{it} \quad \dots \text{eq. 2}$$

**Where:**

SHW	=	Shareholders Wealth Maximization (proxied by total equity (shareholders fund))
OPRK	=	Operational Risk
LIQR	=	Liquidity Risk
MKRK	=	Market Risk
LEV	=	Leverage
$e_{it}$	=	Error terms
"i"	=	Firms
"t"	=	Time

The apriori signs are  $\beta_1 > 0$ ,  $\beta_2 > 0$ ,  $\beta_3 > 0$  and  $\beta_4 > 0$

This connotes that all the endogenous variables are expected to positively influence shareholders wealth maximization in the pharmaceutical sector in Nigeria in the period under investigation.

**Results and Discussion of Findings**

**Descriptive Statistics**

The description of the properties of the variables ranging from the mean of each variable, minimum, maximum and standard deviation are however presented in table 4.1:

**Table 1: Descriptive Statistics**

	SHW	OPRK	LIQR	MKRK	LEV
<b>Mean</b>	6.518124	1.152736	1.213780	0.167452	0.712380
<b>Median</b>	6.569585	0.384650	1.196144	0.058795	0.074666
<b>Maximum</b>	7.236500	6.001946	2.803456	1.306605	9.972041
<b>Minimum</b>	5.590185	0.070495	0.288688	0.002680	0.003974
<b>Std. Dev.</b>	0.471889	1.544125	0.654533	0.289370	1.982509
<b>Skewness</b>	-0.205513	2.016343	0.721960	2.927104	3.830731
<b>Kurtosis</b>	1.937766	6.314966	3.048713	11.07434	17.50103
<b>Jarque-Bera</b>	1.621603	34.06446	2.609098	124.3335	336.2223
<b>Probability</b>	0.444502	0.000000	0.271295	0.000000	0.000000
<b>Sum</b>	195.5437	34.58209	36.41341	5.023564	21.37140
<b>Sum Sq. Dev.</b>	6.457705	69.14538	12.42399	2.428318	113.9799
<b>Observations</b>	30	30	30	30	30

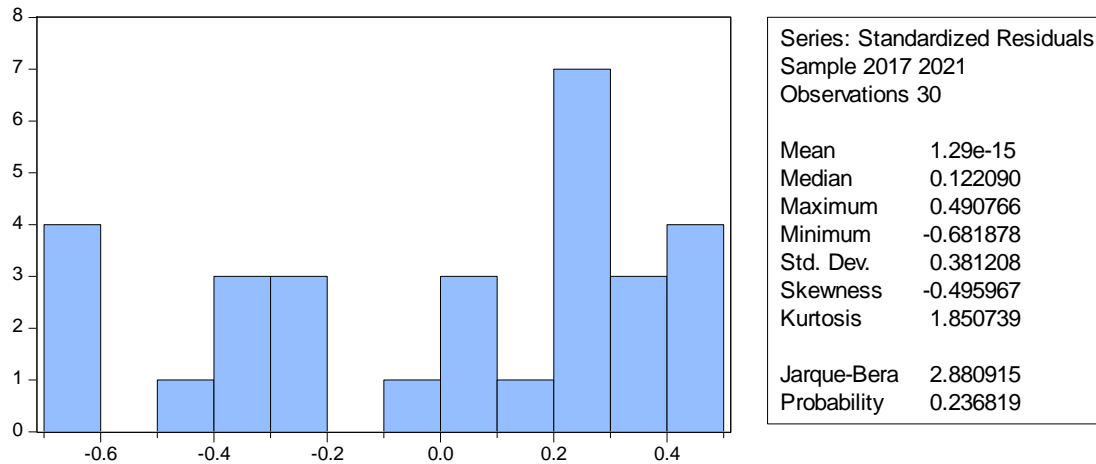
*Source: E-view 9.0 Output, 2023*

The descriptive statistics in table 1 shows the characteristics of the variables from the selected pharmaceutical companies that formed the overall sample of the study. As observed, the mean value of the dependent variable Shareholders Wealth Maximization (proxied by total equity (shareholders fund)) showed positive value ranging from 5.590185 to 7.236500 suggesting that Shareholders Wealth Maximization (SHW) of the selected pharmaceutical companies for the period under review skewed towards the positive. The mean values of all the other independent variables [Operational Risk (OPRK),



Liquidity Risk (LIQR), Market Risk (MKRK) and Leverage (LEV)] showed positive values with mean values of 1.152736, 1.213780, 0.167452, and 0.712380 respectively. The standard deviations of each of the variables showed minimal dispersion ( $\pm$ ) from the mean values which are highly desirable. More so, the probability values of the Jargue Bera test for all factors are significantly lower than the 0.05 indicating that the series are uniformly distributed.

**Figure 1** Normality Test



**Source:** Researchers Computation (2023)

The histogram normality and other descriptive statistics of the regression variables are revealed in the normality test above. The result showed a mean Jarque-Bera test of 2.880915 and associated probability value of 0.236819 which is significantly greater than the 5% level indicating that not all the series are evenly distributed. Thus, the issue of endogeneity arising from the heterogeneous nature of the data are likely evident.

**Table 2: Correlation Analysis**

Covariance Analysis: Ordinary  
 Date: 07/14/23 Time: 23:33  
 Sample: 2017 2021  
 Included observations: 30

Correlation t-Statistic Probability	SHW	OPRK	LIQR	MKRK	LEV
<b>SHW</b>	1.000000				
	-----				
		-----			
<b>OPRK</b>	-0.191655	1.000000			
	-1.033295	-----			
	0.3103	-----			
<b>LIQR</b>	0.384595	-0.501914	1.000000		
	2.204658	-3.070671	-----		
	0.0359	0.0047	-----		
<b>MKRK</b>	-0.123918	-0.012309	-0.070362	1.000000	
	-0.660805	-0.065140	-0.373246	-----	
	0.5141	0.9485	0.7118	-----	
<b>LEV</b>	-0.495710	-0.127763	-0.189812	0.174740	1.000000

	-3.020247	-0.681644	-1.022986	0.939087	-----
	0.0053	0.5011	0.3151	0.3557	-----

*Source: Eviews 9 (2023)*

Table 2 presents the correlation matrix of variables adopted in the study. The aim is to show how the variables are related among themselves and to also check for possible high correlations which could lead to multicollinearity problem. As observed from the result, an insignificant negative correlation exists between the dependent variable Shareholders Wealth Maximization (SHW) and the variables of Operational Risk (OPRK), Market Risk (MKRK) and Leverage (LEV) at -0.191655, -0.123918 and -0.495710 respectively; while the variables of Liquidity Risk (LIQR) showed insignificant positive associations with the dependent variable Shareholders Wealth Maximization (SHW) at 0.384595. However, the variable that have significant association with the dependent variable of Shareholders Wealth Maximization (SHW) passed the scale at 1% level of confidence. This suggests that all the independent variables move in the same direction with the dependent variable. It is also observable that the issue of high-correlation is not evident among the variables as none of the correlation coefficients is above 0.90.

### Diagnostic Tests

To ensure reliability and validity of the empirical results, some diagnostic tests were conducted. In order to test for the presence of multicollinearity in the model, the Variance Inflation Factor (VIF) was carried out, the Hereroskedasticity test was conducted using Breusch-pagan-Godfrey test.

**Table 3: Variance Inflation Factors**

Variance Inflation Factors

Date: 07/14/23 Time: 23:38

Sample: 1 30

Included observations: 30

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
OPRK	0.003501	2.263916	1.436016
LIQR	0.019910	6.687573	1.467389
MKRK	0.071722	1.391099	1.033187
LEV	0.001689	1.294566	1.142023
C	0.059261	10.54655	NA

*Source: Eviews 9 (2023)*

The result of the variance inflation factor in Table 4.3 shows the absence of multicollinearity. The centered VIF values of the explanatory variables are far below the benchmark of 10. The explanatory variables of Operational Risk (OPRK) reported a centered VIF of 1.436016; Liquidity Risk (LIQR) 1.467389, Market Risk (MKRK) 1.033187 and Leverage (LEV) 1.142023. All the variables of the model recorded a centered VIFs that are not substantially above 1.00 and are not indicative of the problem of multicollinearity.

**Table 4: Heteroskedasticity Test: Breusch-Pagan-Godfrey**

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	1.912615	Prob. F(4,25)	0.1396
Obs*R-squared	7.029419	Prob. Chi-Square(4)	0.1343
Scaled explained SS	2.076459	Prob. Chi-Square(4)	0.7217

*Source: Researcher's Compilation (2023)*

The test for Heteroskedasticity is presented in Table 4. It checks for the presence of non-constant variable leading to the breakdown of the BLUE properties in which the efficiency and consistency property may be lost. The decision rule is to conclude that there is no Heteroskedasticity if the F-statistic values are respectively greater than the critical values at 5% level. In the absence of this (i.e. if the critical values at 5% is greater than the F-statistic and observed R-square value), we conclude that there is Heteroskedasticity. As shown in Table 4.4, the p-value (4.25%) of the corresponding observed chi-square value is greater than 5%. Hence, we accept the null hypothesis of heteroskedastic error term which is desirable. The implication of this is that the regression results can be applied reliably.

### Estimation Results

The fixed effect and random effect model estimation technique were adopted. However, in order to ascertain the one that is most appropriate. The Hausman's Test was applied; the result obtained is show below:

**Table 5: Hausman Test Result**

Correlated Random Effects - Hausman Test

Equation: Untitled

Test period random effects

Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random		0.253848	4	0.9926
<b>Period random effects test comparisons:</b>				
Variable	Fixed	Random	Var(Diff.)	Prob.
OPRK	-0.035059	-0.042437	0.000566	0.7566
LIQR	0.173655	0.161833	0.001689	0.7736
MKRK	0.003118	-0.046355	0.018029	0.7125
LEV	-0.108593	-0.110891	0.000414	0.9100

Source: Author's Computation (2023)

**Null Hypothesis:** Random effect model is not desirable

**Alternative Hypothesis:** Random effect model is desirable.

Decision Rule: Accept null if product is greater than 5%.

Accept alternative if product is less than 5%.

From the result of the Hausman Test, the chi-square statistics has a value of 0.99 and the corresponding p-value is greater than 5%. Hence, the null hypothesis was accepted. This implies that the random effect model is most appropriate for the study, (see appendix) in order to provide a comprehensive overview of the results.

**Table 5:**

Dependent Variable: SHW

Method: Panel EGLS (Period random effects)

Date: 07/14/23 Time: 23:26

Sample: 2017 2021

Periods included: 5

Cross-sections included: 6 Total panel (balanced) observations: 30

Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
OPRK	-0.042437	0.064171	-0.661303	0.5145
LIQR	0.161833	0.153033	1.057504	0.3004
MKRK	-0.046355	0.290455	-0.159594	0.8745
LEV	-0.110891	0.044572	-2.487890	0.0199

<b>C</b>	6.457372	0.264020	24.45790	0.0000
Effects Specification				
			S.D.	Rho
<b>Period random</b>			7.30E-08	0.0000
<b>Idiosyncratic random</b>			0.445289	1.0000
Weighted Statistics				
<b>R-squared</b>	0.347406	Mean dependent var		6.518124
<b>Adjusted R-squared</b>	0.242991	S.D. dependent var		0.471889
<b>S.E. of regression</b>	0.410573	Sum squared resid		4.214261
<b>F-statistic</b>	3.327161	Durbin-Watson stat		1.633504
<b>Prob(F-statistic)</b>	0.025751			
Unweighted Statistics				
<b>R-squared</b>	0.347406	Mean dependent var		6.518124
<b>Sum squared resid</b>	4.214261	Durbin-Watson stat		1.633504

*Source: Researcher's Computation via Eviews 9 (2023)*

As shown in the above table, the R-squared coefficient of determination stood at 0.34 which indicates that the model explains about 34% of the systematic variations in the dependent variable Shareholders Wealth Maximization (SHW). The Adjusted R<sup>2</sup> which controls for the effect of inclusion of successive explanatory variables on the degrees of freedom was 24% meaning that about 36% of the systematic variations in Shareholders Wealth Maximization (SHW) were not explained by the model after adjusting for the degree of freedom. However, the proportion of the variation not captured by the model has been addressed by the error term. The f-statistics value and the associated p-value stood at 3.327161 and 0.025751 respectively indicating that the hypothesis of a joint statistical significance of the model cannot be rejected at 5% level of significance and the linearized specification of the model can be assumed as appropriate.

The evaluation of the slope coefficients of the independent variables revealed the existence of negative relationship between Operational Risk (OPRK), Market Risk (MKRK), Leverage (LEV) and the dependent variable Shareholders Wealth Maximization (SHW) as depicted by the slope coefficient of -0.042437, -0.046355 and -0.110891 respectively. On the other hand, the other independent variable of Liquidity Risk (LIQR) has positive relationships of 0.012452 with the dependent variable Shareholders Wealth Maximization (SHW) as shown in the table. It is worthy to note that the variables of Leverage (LEV) passed the significance test at 5% level respectively, while the other three independent variable of Operational Risk (OPRK), Liquidity Risk (LIQR), Market Risk (MKRK) were not statistically significant meaning the variable of Operational Risk (OPRK), Liquidity Risk (LIQR) and Market Risk (MKRK) did not significantly influence Shareholders Wealth Maximization (SHW) of quoted pharmaceutical companies in Nigeria during the period under review as depicted by the findings of this study. Thus, a unit change in Operational Risk (OPRK), Liquidity Risk (LIQR), Market Risk (MKRK) may likely decrease Shareholders Wealth Maximization (SHW) significantly by up to 0.51%, 0.30% and 0.87% respectively, while Leverage (LEV) may likely increase Shareholders Wealth Maximization (SHW) significantly by up to 0.01%. Lastly, the Durbin-Watson value of 1.63 suggests that there is no evidence of autocorrelation among the error term.

### **Test of Hypotheses**

The employed hypotheses are statistically tested below as shown in their null form. The study sets its decision rule for the acceptance of the hypothesis at 5% level of significance; hence, the null hypothesis

would be rejected if the probability value is less than 5% (0.05). The following are the results of the tested hypothesis:

#### **Hypothesis One:**

H<sub>01</sub>: There is no significant relationship between operational risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria.

The first hypothesis of the study seeks to justify if there is significant relationship between Operational Risk (OPRK) and Shareholders Wealth Maximization (SHW). Utilizing the regression output in the previous table, and judging by the significance level of 0.51 which is greater than the 0.05 significance level as depicted in the regression Table 4.5, the study therefore accept the null hypothesis and concluded that there is no significant relationship between operational risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria during the period of the study.

#### **Hypothesis Two:**

H<sub>02</sub>: There is no significant relationship between liquidity risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria.

In the second hypothesis, the study seeks to clarify whether or not if there is a significant relationship between Liquidity Risk (LIQR) and Shareholders Wealth Maximization (SHW). Based on the regression result in table 4.5, Liquidity Risk (LIQR) was negatively and insignificantly related to Shareholders Wealth Maximization (SHW). It had a p-value of 0.5145 which is greater than the critical value of 0.05. Hence, the null hypothesis as stated is rejected. This means that there is no significant relationship between liquidity risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria.

#### **Hypothesis Three**

H<sub>03</sub>: There is no significant relationship between market risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria.

The third hypothesis of the study seeks to determine whether or not a significant relationship exists between Market Risk (MKRK) and Shareholders Wealth Maximization (SHW). Based on the regression output in the previous table 4.5, and judging by the significance level of 0.8745 which is greater than the 0.05 significance level as depicted in the regression. The study therefore accepts the null hypothesis and concluded that there is no significant relationship between market risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria during the period of the study.

#### **Hypothesis Four**

H<sub>04</sub>: There is no significant relationship between leverage and shareholders wealth maximization in the pharmaceutical sector in Nigeria.

The fourth hypothesis of the study seeks to determine whether or not a significant relationship exists between Leverage (LEV) and Shareholders Wealth Maximization (SHW). Based on the regression output in the previous table 4.5, and judging by the significance level of 0.0199 which is less than the 0.05 significance level as depicted in the regression. The study therefore rejects the null hypothesis and concluded that there is no significant relationship between leverage and shareholders wealth maximization in the pharmaceutical sector in Nigeria during the period of the study.

### **Summary of Findings, Conclusion and Recommendations**

#### **Summary of Findings**

Sequel to the data collected from the financial statement of selected quoted pharmaceutical sector in Nigeria, and the analysis made using the Panel Least Squares regression techniques was utilized in testing the formulated hypotheses. One model was built in this study, which has Shareholders Wealth Maximization (SHW) as the dependent variable and Operational Risk (OPRK), Liquidity Risk (LIQR), Market Risk (MKRK), Leverage (LEV) as the independent variables. Based on the analysis, the following findings were achieved from the model, that;

1. There is a negative and insignificant relationship between operational risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria.
2. There is a positive and insignificant relationship between liquidity risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria.
3. There is a negative and insignificant relationship between market risk and shareholders wealth maximization in the pharmaceutical sector in Nigeria.
4. There is a positive and significant relationship between leverage and shareholders wealth maximization in the pharmaceutical sector in Nigeria.

### **Conclusion**

The outcome of this study offers an important insight into risk management and shareholders wealth maximization among listed pharmaceutical companies in Nigeria. A sample of six (6) pharmaceutical companies listed on the Nigeria Exchange Group were used for a period of five (5) years (2017 – 2021) with Shareholders Wealth Maximization (SHW) captured as the dependent variable, while the independent variables include Operational Risk (OPRK), Liquidity Risk (LIQR), Market Risk (MKRK) and Leverage (LEV). The findings as we gathered through the analysis show that the variables of Operational Risk (OPRK), Liquidity Risk (LIQR) and Market Risk (MKRK) has insignificant influence on Shareholders Wealth Maximization (SHW) among pharmaceutical companies listed in Nigeria, while Leverage (LEV) exhibited significant relationship with Shareholders Wealth Maximization (SHW) among pharmaceutical companies listed in Nigeria for the period under review, hence we can conclude that a unit change in Operational Risk (OPRK), Liquidity Risk (LIQR) and Market Risk (MKRK) may likely decrease Shareholders Wealth Maximization (SHW) significantly by up to 0.51%, 0.30% and 0.87% respectively, while a unit change in Leverage (LEV) may lead to an increase in Shareholders Wealth Maximization (SHW) among pharmaceutical companies listed in Nigeria by 0.014%.

### **Recommendations**

1. The study recommended that the management of listed pharmaceutical companies in Nigeria should put adequate resources in place that will enable them understand operational risk so as to guarantee effective operational risk management in order to enhance shareholders wealth maximization.
2. The study recommended that management of listed pharmaceutical companies in Nigeria should endeavor to cut down the time period it uses to translate inventories and trade receivables into cash. Adopting this method would guarantee incessant cash and cash equivalent supply and guarantee the resolution of trade payables without delay and successful and well-organized cash flow management. Doing this will to a very large extent improve shareholders wealth maximization.
3. The managers' of listed pharmaceutical companies in Nigeria should adopt optimum market risk management policy measures capable of promoting shareholders wealth maximization.
4. It is also recommended that an appropriate debt- equity mix should be adopted by listed pharmaceutical companies in Nigeria if they must improve their shareholders wealth maximization and remain competitive.

### **REFERENCES**

Abubakar, A. (2020). Financial leverage and financial performance of oil and gas companies in Nigeria. *Open Journals of Management Science*, 1(1), 28 – 44.

- Al-Mohareb, M. & Alkhalaileh, M. (2019). The association between earnings management and capital structure: An empirical study on Jordanian firms listed in Amman Stock Exchange. *International Journal of Economics and Financial Issues*, 9(6), 106 – 112.
- Anetoh, V. C., Nwadior, G. N., Anetoh, J. C. & Okeke, G. N. (2021). Effect of credit and operational risk management on firm value of deposit money banks in Nigeria. *African Journal of Accounting and Financial Research*, 4(1), 14 – 32.
- Arratia, A. (2014). Computational finance. An introductory course with R. Barcelona: Atlantis Press.
- Ayodele, T. D. & Alabi, R. O. (2014). Risk management in Nigeria banking industry. *Research Journal of Finance and Accounting*, 5(2), 131 – 136.
- Baah, A., Agyapomaa, G., Elikplimi, K., & Alexander, B. (2018). Does corporate governance structures promote shareholders or stakeholders value maximization? Evidence from African banks corporate governance. *The International Journal of Business in Society*, 18(2), 270-288.
- Baker, H. K., & Filbeck, G. (2013). Portfolio theory and management. Oxford: Oxford University Press.
- Bankole, K. O., Ukolobi, I. O., & McDubus, O. F. (2018). Creative accounting practices and shareholders' wealth. *Accounting and Taxation Review*, 2(4), 58 – 74.
- Bayunanda, A., Ompusunggu, A. P. & Ak, M. S. (2018). Influence of debt to equity ratio, return on assets and earning management on tax avoidance: Survey on manufacturing companies registered in BEI. *International Journal of Business, Economics and Law*, 15(5), 133 – 142.
- Bayyoud, M. & Sayyad, N. A. (2015). The impact of internal control and risk management on banks in Palestine. *International Journal of Economics, Finance and Management Sciences*, 3(3): 156 – 161.
- Chukwunulu, J., Ezeabasili, N., & Igbodika, M. (2018). Risk management and the performance of commercial banks in Nigeria. *IARD International Journal of Banking and Finance Research*, 5(1), 231 – 247.
- Effiong, S. A. & Enya, E. F. (2020). Liquidity risk management and financial performance: are consumer goods companies involved? *International Journal of Recent Technology and Engineering*, 9(1), 580 – 589.
- Ekinci, A. (2016). The effect of credit and market risk on bank performance: evidence from Turkey. *International Journal of Economics and Financial Issues*, 6(2), 427 – 434.
- Fadun, O. S. & Oye, D. (2020). Impacts of operational risk management on financial performance: a case of commercial banks in Nigeria. *International Journal of Finance & Banking Studies*, 9(1), 22 – 35.
- Fatimehin, A. D. (2022). Effect of risk management on the financial performance of listed consumer goods firms in Nigeria. *Bingham University Journal of Accounting and Business*, 7(1), 116 – 127.
- Florin, T., Florin, D., Petre, B., Pavel, F., & Sorina, C. (2017). Practical aspects of portfolio selection and optimization on the capital market. *Economic Research*, 30(1), 14 – 30.
- Froko, N. A. (2017). Short term financial leverage and shareholders' wealth maximization of Ghanaian banks: new theoretical evidence. *Research Journal of Finance and Accounting*, 8(13), 1 – 8.
- Green, R. M. (1993). Shareholders as stakeholders: Changing metaphors of corporate governance. *Washington and Lee Law Review*, 50(5), 4 – 9.
- Igbal, U. & Usman, M. (2018). Impact of financial leverage on firm performance. *SEISENSE Journal of Management*, 1(2), 70 – 78.
- Kassi, D. F., Rathnayake, D. N. & Edjoukou, A. J. R. (2019). Market risk and financial performance of non-financial companies listed on the Moroccan Stock Exchange. *Peer-reviewed version*, 1 – 24.
- Khan, A. A. S., Khan, Z., Ramakrishnan, S., Abbas, M. A. & Mahar, O. (2020). Performance of firms having liquidity risk: Evidence from Pakistani banks listed in stock exchange. *Ilkogretim Online - Elementary Education Online*, 19(4), 2898 – 2905.
- Leong, L. (1996). The theory of Value at risk. *Journal of Money, Credit and Banking*, 27(7), 40 – 42.
- Manganelli, G. & Eangle, C. (2001). Foreign bank entry, market structure and bank efficiency. *Journal of Policy Research*, 1(1), 1- 5.
- Marty, W. (2013). Portfolio analytics. An introduction to return and risk measurement. Geneve: Springer International Publishing Switzerland.
- Meshack, K. M. & Mwaura, R. W. (2016). The effect of operational risk management practices on the financial performance in commercial banks in Tanzania. *American Journal of Finance*, 1(6), 29 – 39.
- Muthia, F., Ghasarma, R., Andaiyani, S. & Setiawan, R. (2019). The nexus between operational risk and profitability in Islamic banking. *Advances in Economics, Business and Management Research*, 142(1), 407 – 411.
- Namasake, W. K. (2016). The effect of market risk on the financial performance of commercial banks in Kenya. Unpublished M.Sc. project submitted to School of Business, University of Nairobi.
- Noor, J. A. & Abdalla, A. I. (2014). The impact of financial risks on the firms' performance. *European Journal of Business and Management*, 6(5), 97 – 101.
- Noor, J. A. I., Njeru, A. & Muoria, E. (2017). Effects of market risk on performance of transport firms in Kenya. *IJRDO-Journal of Business Management*, 3(10), 50 – 71.
- Nwaobia, A. N. & Ajayi, A. (2020). Financial reporting quality and shareholders' wealth maximization: evidence from listed companies in Nigeria. *European Journal of Accounting, Auditing and Finance Research*, 8(6), 1 – 14.
- Odubuasi, A., Wilson-Oshilim, U. D. & Ifurueze, M. (2020). Effect of market risks on the financial performance of firms in Nigeria. *European Journal of Accounting, Auditing and Finance Research*, 8(6), 28 – 45.
- Ogbeiw, K. O. & Okoughenu, S. A. (2020). Market risk and corporate performance: An insight into the Nigerian listed companies. *Ilorin Journal of Accounting*, 7(1), 53 – 71.
- Ogundajo, G. O., Adefisoye, A. & Nwaobia, A. N. (2020). Risk management and shareholders' wealth maximization. *International Journal of Business, Economics and Management*, 7(6), 387 – 400.
- Ojo, A. (2019). Internal audit and risk management in Nigeria's public sector. *International Journal of Business & Law Research*, 7(2), 1 – 15.

- Okpala, N. E., Ifurueze, M. & Ofor, N. (2021). Effect of financial and operational risk management disclosures on performance of firms' in Nigeria and Ghana. *Journal of Accounting and Financial Management*, 7(4), 65 – 77.
- Oladipupo, A. O. & Okafor, C. A. (2006). Control of Shareholders' Wealth Maximization in Nigeria. *Journal of Business Systems, Governance and Ethics*, 6(1), 19 – 24.
- Onifade, H. O., Momoh, Y. C. & Ajulo, O. B. (2021). Impact of firm leverage on earning management: an assessment of listed pharmaceutical companies in Nigerian stock exchange. *International Journal of Advanced Research in Multidisciplinary Studies*. 1(1), 25 – 33.
- Otieno, F. O. (2020). Influence of liquidity risk on financial performance of agricultural firms listed on Nairobi Securities Exchange in Kenya. *The Strategic Journal of Business & Change Management*, 7(4), 985 – 994.
- Oyinloye, L., Olaniyan, T. O. & Agbadua, B. O. (2020). Effect of financial leverage on shareholder's returns in a dynamic business environment. *Corporate Governance and Organizational Behavior Review*, 4(2), 40 – 49.
- Reschiwati, R., Syahdina, A. & Handayani, S. (2020). Effect of liquidity, profitability, and size of companies on firm value. *Utopía y Praxis Latinoamericana*, 25(6), 325 – 331.
- Retkaputri, D. & Husodo, Z. A. (2021). The impact of firm leverage on shareholders' wealth in Southeast Asia. *Advances in Economics, Business and Management Research*, 177(1), 222 – 243.
- Temile, S. O., Enakirerhi, L. I., Felix, I. E. & Jatmiko, D. O. (2019). Risk management and internal control system of Nigeria's banking sector. *Humanities & Social Sciences Reviews*, 7(4), 943 – 949.
- Theophilus, A. A. & Ademola, A. (2020). Quality of accounting numbers and shareholders wealth maximization: empirical evidence for investment decisions in Nigeria. *International Journal of Finance and Accounting*, 9(3), 45 – 55.
- Yamai, Y., & Yoshiba, T. (2002). On the validity of value-at-risk: Comparative analyses with expected shortfall. *Monetary and Economic Studies*, 20(1), 57-85.
- Yameen, M., Farhan, N. H. S. & Tabash, M. I. (2019). The impact of liquidity on firms' performance: empirical investigation from Indian pharmaceutical companies. *Academic Journal of Interdisciplinary Studies*, 8(3), 212 – 220.
- Yousfi, I. (2014). Risk management practices and financial performance in Jordan: Empirical Evidence from Islamic Banks. *Published by Faculty of Economics, Commerce & Management, Ferhat Abbass Setif University, Algeria.*