

# Financial Variables and Systematic Risk among Deposit Money Banks in Nigeria

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**Abstract:** This study investigated the effect of financial variables on systematic risk (beta) of Money Deposit Banks in Nigeria. Five hypotheses were formulated following five specific objectives stated for the study. The dependent variable of the study is systematic risk while the independent variables employed for this study are liquidity, profitability, operating efficiency, growth rate and leverage while firm size was used as control variable. This study adopted on ex-post facto research design and secondary data were obtained from published annual reports and accounts of ten (10) quoted money deposit banks for a seven-year period of 2012 and 2018. The data collected were analyzed using descriptive statistics, correlation analysis while pooled multiple regression and other diagnostic test were used in testing the formulated hypotheses. Analyses showed that all the variables have statistical insignificant positive effect on systematic risk of money deposit banks in Nigeria during the period under investigation. Hence, in the light of the result which was obtained, we recommend among others that since variation in liquidity, operating efficiency, firm growth rate and firm leverage did not have a significant effect on systematic risk, risk managing policies of these banks should not focus on these financial variables in a bid to altering the companies systematic risk exposure. Furthermore, investor should also look for alternative means of predicting the level of systematic risk of a firm for efficient portfolio management.

## 1. INTRODUCTION:

Recent global financial crisis has clearly evidenced the need for all stakeholders to develop a comprehensive understanding of corporate systematic risk. Earlier studies explored have shown that corporate investors want a high return from investments which goes a long way to increase the associated risk. Systematic risk can be caused by recessions, political factors, economic crises, changes in taxation, natural disasters, foreign investment policy, war, variation in interest rate policy etc. which can affect the entire market but can be avoidable through diversification (Nucera, Schwaab, Koopman, & Lucas 2016). For a trade on an open market firm in such a business sector, as assumed by financial specialists the danger of a company's stock indicated the danger of a firm. High firms' risk is evidenced by higher stock instability and the vice versa (Nawaz, Ahmed, Imran, Sabir, Arshad, Rani & Khan; 2017). According to (Mulli, 2014) risk is the possibility that a certain unfavorable event will occur, which may be attributed to the probability of earning less than the expected return on investment.

There are two kinds of risk: systematic and unsystematic risk. Both systematic and unsystematic risk affects stock prices. The risk that can be diversified is called unique risk or firm-specific risk or unsystematic risk or diversifiable risk (Puspitaningtyas, 2015). The systematic risk is also known as undiversifiable risk, which is caused by the influence of external factors on an organization. Such factors are beyond the normal control of an organization (Dedunu, 2017). However, the concern of diversified investors is the systematic risk and there is a higher rate of return for stock that has a higher systematic risk (Rowe & Kim 2010). Therefore, financial variables effects on systematic risk of common stocks are the most significant information for company to enhance shareholder's wealth.

Accordingly, Sharpe (1964) proposed that as a component of the Capital Asset Pricing Model (CAPM) beta coefficient ( $\beta$ ) is one of the most respected measurements of risk. This model beta, which is based on Markowitz's portfolio theory (1952), is a measure of relative risk. Puspitaningtyas (2017) stated that CAPM is used to determine a theoretically appropriate required rate of return of an asset. The model takes into consideration the sensitivity the asset to systematic, which is also known as market risk or risk non-diversifiable risk. It is normally represented by the proportion of beta ( $\beta$ ) as well as the expected return of the market and the expected return of a theoretical risk-free asset in the financial industry. However, Dedunu (2017) proposed that there is a direct link between risk and expected return. This means that when the level of risk on any investment is high, the expected return of that investment will equally increase. Systematic risk of a firm is vital because it indicates the level of risk of the firm in relation to the market risk (Dedunu 2017) Consequently, wealth maximization is the heartbeat of every investor but the problem is the ability to construct efficient portfolios. To achieve this, investors should have a good understanding of the systematic risk inherent in the investment.

Therefore, to understand the relationship that exists between financial variables and systematic risk is vital for companies' financial managers and investors. This study therefore is aimed at evaluating the kind of relationship that exists between financial variables and systematic risk using deposit money bank as a case point.

## 2. OBJECTIVE OF THE STUDY

The main objective of this study is to ascertain the relationship between systematic risk (beta) and financial variables of deposit money banks in Nigeria. The specific objectives are to:-

- Investigate the influence of liquidity on systematic risk of deposit money banks in Nigeria.
- Examine the effects of profitability on systematic risk of deposit money banks in Nigeria.
- Determine the influence of operating efficiency on systematic risk of deposit money banks in Nigeria.
- Access the influence of growth rate on systematic risk of deposit money banks in Nigeria.
- Investigate the effect of leverage on systematic risk of deposit money banks in Nigeria.

### 2.1 Research Hypotheses

The following null hypotheses were formulated for the study:

- H0<sub>1</sub>.** Liquidity has no significant effect on systematic risk of deposit money banks in Nigeria.  
**H0<sub>2</sub>.** Profitability does not significantly affect systematic risk of deposit money banks in Nigeria.  
**H0<sub>3</sub>.** Operating efficiency does not significantly affect systematic risk of deposit money banks in Nigeria.  
**H0<sub>4</sub>.** Growth rate does not significantly affect systematic risk of deposit money banks in Nigeria.  
**H0<sub>5</sub>.** Leverage does not significantly affect systematic risk of deposit money banks in Nigeria.

## 3. REVIEW OF RELATED LITERATURE:

### 3.1. Systematic Risk:

Risk is defined as the possibility of realizing low returns or even making loss, thereby preventing you from meeting required objectives (Bodie, Kane and Marcus (2009). There are two types of risk in investments: Systematic risk and unsystematic risk (Estrada, 2002; Bodie, Kane and Marcus, 2009; Sudarsono, Husnan, Tandelililn and Ekawati, 2012; Toth, Lancaric, Piterkova and Savov, 2014; Puspitaningtyas, 2015). The risk that can be eliminated by diversification is called unique risk or firm-specific risk or unsystematic risk or diversifiable risk (Estrada, 2002; Bodie, Kane and Marcus, 2009; Toth, Lancaric, Piterkova and Savov, 2014; Puspitaningtyas, 2015). Although systematic risk is caused by non-firm reasons, internal factors of the firms contribute to the level of the systematic risk. In other words, firm's internal factors can determine the extent of the effect of systematic risk on that firm (karakus 2017).

The risk that cannot be lost through diversification is called systematic risk or beta ( $\beta$ ) (Scott, 2009; Estrada, 2002; Anjum, 2014; Toth, Lancaric, Piterkova and Savov, 2014; Puspitaningtyas, 2015). Beta is a measure of the movement between the change in the price of securities and changes in the market value of the market portfolio. Beta is a measure of the return movement of securities (portfolio) to market return (Puspitaningtyas, 2017). For the purpose this study, systematic risk is denoted as beta coefficient ( $\beta$ ), which calculates the level of security's systematic risk compared to that of the market portfolio. It means that change in stock due to change in market or more comprehensively it is covariance of stock returns of capital market, (Gu and Kim, 2002). Beta of securities can be calculated through estimation techniques, using historical data in such as market data and accounting data or fundamental data of a company. Estimating the beta of a securities can be done by regressing the return of securities (as dependent variable), and the market return (as independent variables). The resulting regression equation of time series data will produce beta coefficients, assumed to be stable over time during the period of observation (Puspitaningtyas 2017) For the purpose of this study, systemic risk was measured using beta coefficient, which is determined by regressing market return (change in market price of banking sector) as independent variables and security return (change in security price of individual banks) as dependent variable in line with the work of Puspitaningtyas, (2017).

### 3.2. Financial Variables:

Financial variables have the same meaning as accounting variables or financial ratios. Accounting variable is generally presented as a ratio of finance. It is a variable that presents the information (data) from the accounting of firm's financial accounting process and presented in the financial statements of a company (Puspitaningtyas, 2017).

As cited by Muhammad I, Samina R and Athar I (2018), Foster (1978) states that financial ratios establish the relationship between the items of balance sheet and profit and loss account in order to identify the strength and weaknesses of the firm. Financial ratios indicate the financial position of the company (Meheshwari S, Meheshwari K & Meheshwari K, 2011). This paper therefore gives the meaning of financial variables as variables or financial ratios, which can be used to access organizational performance for a period of time. These variables have well defined with

specific formula and it serves as analytical tool for comparability. The financial variables adopted for this study are: Leverage, Liquidity, Profitability, Firm size, operating efficiency and Growth rate.

### 3.3. Leverage:

Li (2016) stated that financial leverage is the extent to which a company relies on debt. A leveraged company is the company with some debt in its capital structure (Ross, Westerfield, Jaffe and Jordan, 2011). Periasamy, (2009) also defines leverage as the extent to which firms make use of debt to increase profitability. Leverage of the firm is computed by debt-equity ratio, which is obtained by total debt to shareholders equity. It shows the relationship between the proportion of assets provided by the stockholders and the proportion of assets provided by creditors (Srivastava; 2014). Financial leverage can equally mean the level of borrowed fund used by a business or investor in business/investment financing. Thus, it is a measure of the proportion of firm's debt to equity in financing its assets (Joseph; 2018). As debt increases, financial leverage increases (Maghanga and Kalio 2014). In the words of Dogan (2013) as cited by Joseph (2018), financial leverage is a measure of the level equity and debt used by firm to finance its assets.

### 3.4. Liquidity:

Liquidity is having enough money in form of cash, to meet your financial obligations. Liquidity indicates how much a company's able to pay short- term financial obligations at maturity using avail- able liquid assets. One way of measuring the liquidity variables is to use the current ratio, i.e. the ratio between current assets by current liabilities. This measurement shows, how much the company's ability to pay current liabilities with current assets available (Syamsuddin, 2007; Panwala, 2009; Puspitaningtyas, 2015; Niresh, 2012; Ra- jdev, 2013; Putra, Lahindah & Bambang, 2014; Ismail, 2016).

### 3/5. Profitability:

All the efforts of management and planning are directed towards improving profitability (Best, 2012). The word profitability is a combination of two words profit and ability. According to Nishanthini and Nimalathasan,(2013) profit is defined as the excess of inflow over outflow while profitability is seen as the ability of investing in order to earn a return from such investment. Azhar (2019) stated that in an organizational context, profitability is the amount of profit or money a firm is able to realize from its limited resources. In most cases, the main aim of organizations is to increase profitability. Profitability therefore is the ability of the company to benefit from a number of funds invested in the total assets. It is the ratio between the net profit after tax to stockholders' equity. This measurement shows the level of net income realized from owners of companies on capital invested (Puspitaningtyas, 2015; Jami & Bahar, 2016).

### 3/6/ Operating Efficiency:

According to Li (2016), Operational efficiency indicates how efficiently the company generates outputs by inputs, which is the efficient management of the company's assets. The highly efficient company may be facing a lesser probability of loss or actual failure as a result excellent management and therefore, the company exhibits low risk (Borde, 1998). However, high efficiency may be as a result of aggressive implementation of business strategy (Borde, 1998) for example the company that is after fast sales growth without having keen interest in cost control. In such situation, the company may be facing a higher risk (Gu & Gao, 2000). Operational efficiency is measured by efficiency ratios which indicate outputs, often represented by sales revenues, for given level of assets. Operating efficiency can be measured by asset turnover ratio.  $\text{Asset Turn over} = \frac{\text{Total Revenue}}{\text{Total assets}}$ . **3/7/ Growth:**

The common measure of firm growth is annual gross revenues, which is also called total sales. The yearly change in these metric shows whether the overall business profile is increasing, decreasing or static. However, that firm's revenues are growing does not necessarily mean that the firm is financially healthy. For instance, many startups grow revenues quickly but operate at a loss for years. Nevertheless, increase growth in revenue is a high indicator, which shows that a business is becoming more visible and advancing new markets. As cited by Zhou and Wit (2009) growth is an outcome from the organizational resulting from the combination of firm's capabilities, routines and specific resources (Nelson & Winter, 1982). Growth opportunities of a firm are highly related to the organizational production activities (Coad, 2009). As cited by Li (2016), Moyer and Chatfield (1983) explained that investors may regard the growing earnings as the indication that the company has abilities to manage its risk successfully but the company with a low or even negative growth may fail in managing the risk. Annual percentage change in earnings before interest and taxes is used to compute the growth of any firm.

### 3.8. Theoretical Framework

Theories are formulated to predict, explain, and understand phenomena and also to challenge and extend existing knowledge within the limits of critical assumptions. The theoretical framework is the basis that can hold or support a theory of a research study. The theoretical framework presents and describes the theory that describes why the research problem in study exists. This work therefore is anchored on modern portfolio theory.

### 3.9. Modern Portfolio Theory:

Portfolio theory was developed by Harry Markowitz in 1952, which states that instead of concentrating on the risk of each individual asset, a diversified portfolio is less unpredictable than the total sum of its individual parts. Instead of expecting a single asset class to provide a portfolio's returns, having multiple classes spreads out the risk through diversification. The theory states that each security has its own risks and that a portfolio of diverse securities shall be of lower risk than a single security portfolio. Simply put, the theory emphasizes on the importance of diversifying to reduce risk. The theory states that investors should not select portfolios that maximize expected return in isolation, because this condition alone ignores the principle of diversification. He proposed that investors should instead consider variances of return, together with expected returns in order to choose portfolios that offer the highest expected return for a given level of variance. In making this choice, there is need that investors should have good understanding of systematic risk and how to predict such inherent risk in security, in order to diversify their investments so as to achieve efficient portfolio. On this note, this study evaluated the relationship that exists between financial variables and systematic risk (beta), which will be of great benefit to investors in portfolio management.

### 3.10. Empirical Studies:

Kamran and Malik (2018) carried out a study to find out whether financial variables affect the systematic risk in sugar industry. The purpose of the study was to evaluate the relationship between financial variables and systematic risk. The study analyzed the annual data over the period of 2005-2015 from selective industry. To test the studied hypotheses simultaneously, panel tests were applied along with multiple regression analysis approach. The findings of sugar industry showed that liquidity, leverage (insignificant), operating efficiency, dividend payout, and chin model are negatively related while profitability and Tobin q (insignificant) are positively related with Systematic risk. The regression results show that significant association of liquidity, profitability, operating efficiency, growth, dividend payout and chin model are in line with earlier studies. The study further revealed that the studied variables have decisive impact for determinants of Systematic risk. Dedunu (2017) studied the Financial Variables Impact on Common Stock Systematic Risk. The purpose of the study was to evaluate the impact of financial variables on systematic risk of common stock. To achieve the goal of the study, selected 50 companies from CSE including manufacturing sector, beverage food and tobacco sector and hotel sector companies for the period of 2009-2016. The study selected dividend payout, profitability, liquidity and leverage as financial variables. Descriptive statistics, correlation analysis and regression analysis were used to test the variables. Regression results showed that dividend payout had a negative significant relationship with systematic risk while profitability, liquidity and leverage had a positive relationship. Pearson Correlation analysis showed insignificant effect of all the variables on systematic risk (beta). Also, profitability and liquidity had a positive relationship with systematic risk and the dividend payout and leverage represented a negative correlation with beta. Puspitaningtyas (2017) carried out research on estimating systematic risk for the best investment decisions on manufacturing company in Indonesia. The purpose of the paper was to evaluate the influence of the financial information on the systematic risk of stock of manufacturing companies listed on the Indonesia Stock Exchange for a period of five years from January 2011 to December 2015. The collected data was analyzed using multiple linear regression analysis to show that at the 0.05 level only variable sized companies can significantly influence systematic risk. The study revealed that financial leverage, liquidity, and profitability do not affect the systematic risk.

Nawaz, *et al* (2017) studied financial variables and systematic risk. The objective of the study was to determine the relationship between financial determinants and systematic risk of cement industry. Five financial variables were utilized as components, i.e. industry size, operating efficiency, liquidity, profitability, and financial leverage in this study. Six years data from 2008 to 2013 have been collected from Karachi Stock Exchange. The outcome of 29 cement industries revealed that there is a significant relationship between operating, efficiency, industry size and profitability with 181 systematic risks and the result of the study is similar to past studies while there is insignificant relationship between liquidity and financial leverage systematic risk (beta).

Karakus, (2017) researched on the determinants of affecting level from systematic risk: evidence from Bist 100 companies in Turkey. The purpose of the study was to investigate the impact of accounting variables on systematic risk of firms. Data were collected from 58 companies from BIST-100 Index for the period between 2006 and 2015 and panel data analysis was employed. The results of the study showed that there is a significant and positive effect of asset turnover, asset size, previous term equity to total debt and previous term cash ratio on systematic risk. However, there is a negative effect of profitability, cash ratio, equity to total debt, and previous term debt to total assets on systematic risk. The study also determined that previous term beta, consumer price index, and previous term



GDP per capita negatively affects the systematic risk and significantly increases the explanatory power of the model. Sharif, Hamid, Khurram, and Zulfiqar (2016) carried out a study on factors effecting systematic risk in isolation vs. pooled estimation: empirical evidence from banking, insurance, and non-financial sectors of Pakistan. The basic purpose of the financial manager is to maximize the wealth of shareholder by minimizing the risk. The study covered the period of 2010 to 2014 using panel data for common effect model, generalized method of moments and two step regression model. The study concluded that there is variables significance changes from sector to sector in individual spectrum but market value of equity and leverage has negative impact on systematic risk in a pooled regression, whereas profitability, firm size and dividend pay-out has positive effect on systematic risk. Salari (2015) carried out an analysis of systematic risk impact of common stock on financial ratios of accepted plants in Tehran stock exchange. The main purpose of the research was to investigate the relation between systematic risk of common stock and financial ratios of accepted plants in Tehran Stock Exchange using capital asset pricing model (CAPM). To do so, 226 plants whose required data for four-year period of research (2006-2009) were selected. Study was carried out on 8 independent variables (financial ratios) and also systematic risk was considered as dependent variable. Moreover, Hypotheses test was done based on simple and multi variable Regression. Statistical significance of the models was done in accordance with F and t statistics. Ultimately, concluded outcome showed that there is significant relation between research variables (Current ratio, Quick ratio, Liabilities to total assets ratio) and systematic risk. Adhikari (2015) investigated on the Determinants of Systemic Risk for Companies Listed on Nepal Stock Exchange. The study aimed at advancing empirical evidences on financial factors determining systemic risk in the pre-emerging stock market of Nepal as well as to identify whether pre-emerging stock market and developed and emerging stock markets exposed to the same financial factors that determine systemic risk. Data from 15 listed companies for a period of 5 years, 2009 to 2013 was tested and the study showed that profitability and size are positively related with the systemic risk, whereas the dividend payment is related negatively with systematic risk. The results therefore indicated that financial factors have significant predictive power for the systemic risk of a stock investment in Nepal. Kumar, Rahman and Akhtiar (2015) studied the Determinants of Systematic Risk: Empirical Evidence from Pakistan's Banking Sector. A sample of 17 banks out of total 22 listed on Karachi Stock Exchange were selected and studied over the period 2006 to 2012. Panel data analysis techniques of Pooled OLS, Fixed Effects and Random Effect models were used to analyze data and the study concluded that loan portfolio quality and profitability significantly positively affect the systematic risk while liquidity is significantly and negatively affect the systematic risk. Mulli (2014) studied the effect of financial performance on systematic risk of stocks listed at the Nairobi securities exchange. The study sought to establish the effects of firms' financial performance on systematic risk. The study used 20 companies that were continuously traded between 2009 and 2013 excluding the financial institutions. The data was analyzed using regression analysis and concluded that financial performance measure; total assets turnover, current ratio and net profit margin had a positive but statistically insignificant effect on beta while debt to assets ratio had a positive and statistically significant effect on beta coefficient. The study recommends that since debt ratio had a positive and significant effect on beta coefficient managers should be aware of the increasing effect of systematic risk on the cost of capital due to leverage. It also recommends that since assets turnover, liquidity and net profit margin did not have a significant effect on beta managers should not focus on managing operational efficiency, liquidity and profitability as measures of altering the companies systematic risk exposure.

Aruna and Warokka (2013) carried out a study on the Systematic risk and accounting determinants: a new perspective from an emerging market. The purpose of the study was to examine the influences of basic accounting determinants on Indonesian manufacturing industry's systematic risk in the most-recent period, 2005-2007, in order to capture the latest market's perspectives and preferences. The study used firm size, current ratio, debt to total asset ratio, Long-term Debt to Total Asset (LDTA) ratio and growth as variables for accounting determinants and beta as the variable for systematic risk and 15 top and most-traded Indonesian manufacturing firms' stocks were investigated. The results showed that no accounting determinants influence the systematic risk at all. It demonstrated the market behavior that paid less attention to the financial statement information, and seemed to focus more on technical analysis in making an investment decision. It absolutely highlighted on how to manage a market that is seemingly sensitive to non-fundamental factors, i.e., macroeconomic rumors and market sentiment the main drivers of technical analysis. Mardini (2013) analyzed the Determinants of Systematic Risk in the Jordanian Banking Sector. The research provided more determinants of the systematic risk surrounding banks. Consequently, several regression models were employed to test whether there are statistical significant relations among various financial indicators and systematic risk (beta). The results revealed that there is a positive correlation between bank equity beta and bank size, leverage ratio and the volume of loans whereas it correlates negatively with liquidity levels, bank profitability and loan loss provisions. Ana, Iran and Fernando (2012) researched on the Analysis of the Relationship between Accounting Information and Systematic Risk in the Brazilian Market. The objective of the study was to examine the relationship between the accounting betas and the market betas of companies in Brazil. The study selected 97 companies from 15 economic sectors from the Securities, Commodities, and Futures Exchange of São Paulo (Bolsa de Valores, Mercadorias e

Futuros de São Paulo - BM&FBOVESPA) from the first quarter of 1995 to the third quarter of 2009. The study used panel data of 468 accounting variables and employed a regression model to examine the relationship between the variables. The results revealed that some accounting betas may explain the market beta and do so in an anticipated manner and that those accounting betas are able to improve the prediction of the market beta, when used alongside the historical market beta. On the other hand, the most of accounting beta versions displayed a rather insignificant or even non-existent relationship.

#### 4. Summary and Gap in Literature

Most previous study on systematic risk and financial variable were carried on other sectors. Most of these previous studies were done in foreign countries. It is very difficult to find related studies in Nigeria. Again, regression analysis was the prominent analysis tool used for most of the studies reviewed. This study therefore used more robust regression technique, which solves the problem of heterogeneity (difference in firms' characteristics) inherent in the banks used.

#### 5. RESEARCH METHODOLOGY :

The *ex-post facto* research design was employed to investigate the relationship that exists between financial variables and systematic risk among quoted deposit money banks in Nigeria.

The study employed secondary data that collected from published financial statement of deposit money banks listed on the Nigerian Stock Exchange from 2012-2018 and data for systematic risk was collected from Nigerian Stock Exchange (NSE) and website of Cashcraft Asset Management Ltd ([www.cashcraft.com](http://www.cashcraft.com)).

##### 5.1. Population and Sample Size:

The Population of the study consists of all fourteen (14) deposit money banks quoted on the Nigerian Stock Exchange. Ten (10) banks were used for this study after the filtration. Thus sample used for the study was based on availability of data.

##### 5.2. Method of Data Collection and Analysis:

The secondary data collected was analyzed using descriptive statistics, correlation analysis, and regression analysis. However, other diagnostic tests were conducted to confirm the assumptions of regression. Robust regression analysis was used to evaluate the effect of the independent variables on the dependent variable. The result reveals the degree of influence and the level of significance. All hypotheses were tested at 0.05% significance level.

##### 5.3. Model Specification:

The model for the study is premised on the main objective and anchored on the sub-objective. A linear regression model is designed to test each of the null hypotheses. The linear regression model to be used is adapted from the study of Puspitaningtyas, (2017) and modified to suite the variables used in this study. The model of Puspitaningtyas (2017);

$$\beta_t = b_1 + b_2FL_t + b_3Lit + b_4Prt + b_5FZ_t + \mu_t$$

The linear regression model for this study, which will be used in testing the null hypotheses, is as follows:  $SYR = \beta_0 + \beta_1LIQ + \beta_2PROF + \beta_3OPE + \beta_4GR + \beta_5LEV + \beta_6CS + E$ . Where:

SYR = Systematic Risk (Beta)

LIQ = Liquidity

PROF = Profitability

OPE = Operating Efficiency

GR = Growth

LEV = Leverage

CS = Company Size

$\beta_0$  = Constant

$\beta_1 \dots \beta_6$  = are the coefficient of the regression equation.

E = Error term;

#### 6. DATA PRESENTATION, ANALYSIS AND INTERPRETATION :

The study evaluates the relationship that exists between systematic risk (beta) and financial variables of deposit money banks in Nigeria for the periods 2012 - 2018. In this study, systematic risk is denoted as beta. Beta of a securities was estimated by regressing the return of securities (as dependent variable), and the market return (as independent variables). Furthermore, Liquidity has been measured using the values of quick ratio (ratio of current

assets – inventory/current liabilities) and profitability is captured using return on asset. Operating efficiency is captured as the value of asset turn over while growth rate was represented as the rate of earnings before interest and tax. We also employ control variable of firm size in developing the model of the study. Furthermore, we conduct pre regression analysis which includes descriptive statistics, data normality analysis and correlation analysis. Some post regression tests that were conducted include: test for multicollinearity and test for Heteroskedasticity. Finally, a robust regression analysis was carried out to test the formulated hypotheses.

**Descriptive Statistics**

The descriptive statistics result shows the mean (average), median, maximum, minimum standard deviation and count for each of the variables of interest. The results in the table below provide some insight into the nature of the selected Nigerian quoted deposit money banks that were employed in this study.

**Descriptive Statistics**

stats	effi r <sup>o</sup>	liquid <sup>y</sup>	leverage	g_rate	coy_size	prof	sys_risk
mean	.0123729	.6694915	87.01797	15.98232	9.136143	1.621571	.8668571
max	.23	2.18	203.27	65.89	10.77	5.62	1.21
min	-.15	0	8.63	-65.94	8.19	-9.53	.51
sd	.082511	.6652571	17.29128	20.3124	.4364923	2.152266	.102456
N	59	59	69	69	70	70	70

For the variable of profitability we find that it rose from about -9.53k to 5.62k and stayed on an average of 1.62k during the period under consideration. Furthermore, we observed that efficiency ratio rose from -0.15 to a maximum efficiency ratio of 0.23 but maintained an average value of 0.01 during the period under investigation. This could possibly be the reason for the movement in profitability during the period under review. For the variable of growth rate, we observe that the highest growth rate of (65.89%) while the lowest growth rate of (-65.94%) but maintained an average growth of 15.98% during the period under review. This is an indication that the selected banks maintained double digit growth during the period. Furthermore, liquidity management grows from 0 to the tone of 2.18 but on the average, the sampled banks had liquidity management to the tone of 0.66. The zero minimum value for liquidity is an indication that some sampled banks’ liquidity ratio is zero (0), which shows that such banks do not maintain the approved liquidity ratio set out by CBN. Furthermore, the result show that the most leveraged bank among the sampled banks has a leverage of 203.27 while the least is 8.19, having an average of 87.02. This implies that most of the sampled banks employed more debt in financing its asset during the period under review.

**Correlation Analysis**

Correlation analysis is a method of statistical evaluation used to study the strength of a relationship between two, numerically measured, continuous variables. In examining the association among the variables, the study employed the Pearson correlation analysis and the summary of the results are presented in table 4.3 below

**TABLE 4.3: CORRELATION ANALYSIS**

	effi r <sup>o</sup>	liquid <sup>y</sup>	leverage	g_rate	coy_size	prof	sys_risk
effi_ratio	1.0000						
liquidity	0.1882	1.0000					
leverage	-0.0973	-0.3833	1.0000				
g_rate	-0.0563	0.0153	0.1571	1.0000			
coy_size	0.1223	0.5058	-0.3122	-0.1460	1.0000		
prof	0.1400	0.7281	-0.6431	0.0029	0.4804	1.0000	
sys_risk	-0.0055	-0.0254	-0.0667	0.0476	-0.1341	0.0377	1.0000

Correlation analysis on Table 4.3 above among other things showed that two independent variable of interest showed a positive correlation with the variable of systematic risk growth rate (0.0476) and profitability (0.0377) while the other three independent variables efficiency (-0.0055) and liquidity (-0.0254) and Leverage (-0.0667) showed a negative correlation with the systematic risk variable. The correlation result reveal that growth rate and profitability has positive but not strong relationship with systematic risk which indicate that increase in growth rate and profitability may have little effect on the level of systematic risk of deposit money banks. Also the control variable firm size measured by log of total assets has negative correlation with systematic which indicate that growth in size the firms may reduce the systematic risk variable.

**Robust Regression:**

Based on one of the diagnostic test (Heteroskedasticity Test) of the first regression analysis, a robust regression was done. Statistically this was to correct the problem of Heteroskedasticity identified. It is this robust regression that will be employed in interpreting the relationship that exists between financial variables and systematic risk of sampled deposit money banks in Nigeria. R. squared value of 0.36 (4%) and R-squared (adj) .075 (8%) of the first Regression (Table 4.4) is still valid in interpreting the robust regression. The F-statistics value of the robust regression at 0.32 and its probability value of 0.0262 shows that model formulated is appropriate hence the model used for the analysis is appropriate and statistically significant at 1% levels.

**Robust Regression of Systematic Risk (Beta) and Financial Variables**

Number of obs = 59  
 F( 6, 52) = 0.32  
 Prob > F = 0.0262

sys_risk	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
liquidity	.0069923	.0251884	0.28	0.782	-.0435519 .0575365
prof	.0052701	.0116904	0.45	0.654	-.0181885 .0287287
effi_ratio	.0966506	.1341914	0.72	0.475	-.1726241 .3659253
g_rate	.0003006	.000682	0.44	0.661	-.0010678 .0016691
leverage	-.003195	.0047066	0.68	0.500	-.0062494 .0126394
cov_size	-.0176022	.0352591	-0.50	0.620	-.0883548 .0531503
_cons	.7461079	.5230936	1.43	0.160	-.3035561 1.795772

**6. SUMMARY OF FINDINGS:**

The main objective of this study is to evaluate the relationship that exists between systematic risk (beta) and financial variables of deposit money banks in Nigeria. The study employed panel data collected from related annual financial statements for the period of 2012 to 2018.

However, the list below make up the key findings from the study:

- This study reveals that liquidity has positive (+) and insignificant effect on systematic risk of deposit money banks in Nigeria during the period under analysis.
- Also revealed from the study, is that profitability has positive (+) and insignificant affect on systematic risk of deposit money banks during the period under analysis .
- Operating efficiency has positive (+) and insignificant effect on systematic risk of deposit money banks during the period under investigation.
- Firm growth rate has positive (+) and insignificant affect on systematic risk of deposit money banks during the period under investigation.
- Firm leverage has negative (+) and insignificant effect on systematic risk of deposit money banks during the period under investigation.

**7. CONCLUSION:**

It has been sufficiently documented that the main goal of a company is to increase shareholders’ value. Therefore, deep understanding of the risk and associated factors will be very useful for investors and company managers. In the light of the above, this study examined the link between systematic risk and profitability, liquidity, operating efficiency, firm growth rate and leverage variables. On the basis of these financial variables five hypotheses were formulated for emperical testing. Descriptive statistics, correlation and robust regression analysis were employed to study 10 quoted deposit money banks listed on the Nigerian stock exchange market for the period of 2012 to 2018. According to the robust regression analysis, variables of profitability, liquidity, operating efficiency, leverage and firm growth were seen to insignificantly affect systematic risk of deposit money banks in Nigeria during the period under study. The implication of our findings is that these factors can not be used by bank managers and investors to estimate and control systematic risk inherent in a firm. This study is essential for investors and finance managers since it will help them understand that all financial variables insignificantly affect systematic risk.

**8. Recommendation:**

Following on the outcome of our analysis we recommend that since variation in liquidity, operating efficiency, firm growth rate and firm leverage did not have a significant effect on systematic risk, risk managing policies of these banks should not focus on these financial variables in a bid to altering the companies systematic risk



exposure. Investor should also look for alternative means of predicting the level of systematic risk of a firm for efficient portfolio management.

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