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Research Article

DYNAMICS OF MACROECONOMIC VOLATILITY AND INTEREST RATE SPREAD ON EQUITY MARKET LIQUIDITY: EVIDENCE FROM NIGERIA AND SOUTH AFRICA

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Abstract

The study sought to explore the effects of macroeconomic volatility and interest rate differential on stock market liquidity in Nigeria and South Africa from 1984 to 2022.The gross domestic product and Interest rate differentials were used as explained variables, while the money supply and exchange rate served as explanatory variables. The base year (1984) was marked by Food and Agricultural Organization (FAO) Launched by the United Nations to assist in alleviating famine in Africa. A population of 54 countries in Sub-Sahara Africa was sampled, while two countries were selected based on the volume of their market transactions over the years under study. We carried out stationarity test, co-integration test, parameter stability test, arch effect and OLS. Findings indicated that (i) Macroeconomic volatility have a positive and significance effect on the stock market liquidity in Nigeria, while in South Africa, Macroeconomic volatility have positive and non-significance effect on the stock market liquidity .(ii) Interest rate have a negative and non-significance effect on the stock market liquidity in South Africa and Nigeria .It was recommended that government need to enact sound monetary policies in order to enhance economic growth in both countries under study. The government will also need to benchmark for best practices in monetary policy development from those economies that are more advanced in order to develop better monetary policies that can improve the performance of the stock market. (ii)The government need to create an enabling environment and promote infrastructural development to facilitate the ease of stock market activities in particular and financial system of both countries.

Keywords: Macro-economic volatility, Stock Market, co-integration and Arch Effect.

1.0 Introduction

The ever-growing need for well-functioning stock markets for economic growth and development has drawn the attention of many researchers globally, especially in emerging economies. This is because a stock market serves as an avenue through which funds are generated and mobilized for productive use, thus, a catalyst for enhancing the economic growth of a country. Investors have a keen interest in knowing variables that may help forecast stock prices. Thus, can more perfectly manage their positions and portfolios (maximize returns and/or minimize risk), if they can use macroeconomic news releases as reliable indicators for where the stock market is headed. conversely, policymakers meticulously focus on the situation of the stock market which can be regarded as a leading indicator of future macroeconomic activity. "Market liquidity is mainly evidence of its efficiency". Illiquidity in markets is a red signal that the market is poorly functioning which can lead to a financial crisis. The measurement of liquidity is an important question that need to be answered. Four dimensions are important in this respect. (1) Trading Time – the ability to execute a transaction immediately at prevailing price. (2) Tightness – the ability to buy or sell an asset at same time and same price. (3) Depth – the ability of buying and selling a

certain amount of an asset without influencing the quoted price. (4) Resiliency – The ability of buying and selling a certain amount of an asset with least effect on quoted price, (Kiran & Sadaf 2017).

1.1 Statement of Problem:

Despite the crucial role of stock markets in promoting economic growth, African stock markets are considered small, illiquid with infrastructural bottlenecks and weak regulatory institutions. Thus, since most investors are risk averse, they tend to run away from the market when there is uncertainty in expected returns. High market volatility increases unfavorable market risk premium.

1.2 Objective of the study:

Examine the impact of macroeconomic volatility and of interest rate differentials on stock market liquidity in Nigeria and South Africa.

Ho_1: Macroeconomic volatility and Interest rate differentials does not have positive and significance impact on stock market liquidity in Nigeria and South Africa

1.3 Scope of the study

This study seeks to investigate the impact of macroeconomic volatility and interest rate differentials on stock market liquidity in Nigeria and South Africa from the period (1984-2022). The base year (1984) was marked by Food and Agricultural Organization (FAO)Launched by the United Nations to assist in alleviating famine in Africa. A population of 54 countries in Sub-Sahara Africa was sampled ,while two countries were selected based on the volume of their market transactions over the years under study.

2.0 REVIEW OF RELATED LITERATURE

2.1 Conceptual review

2.1.1 Macroeconomic volatility

It is reasonably unarguable to believe the notion that the general macroeconomic, whether volatile or not can have a significant impact on the stock market of country (David & Ampah, 2019).

Macroeconomic volatility can be seen as a fluctuation of an economic variables due to either domestic or external shocks that are not foreseeable or predictable. Macroeconomic volatility implies the vulnerability of macroeconomic variables to shocks. It is a situation where there is possibility of macroeconomic variables such GDP, money supply, industrial productions, oil price, trade openness, exchange rate and, interest rate etc to be unstable and weak when it comes to absorbing shock.

2.1.2 Interest rate differential

There are several tools of monetary policy that governments or monetary authorities can use to influence the economy one of such tools is interest rate. If monetary authorities want to tighten the economy, they will increase interest rate. Interest rate, according to Uchendu (1993) as cited in Salama (2018) “can be defined as the return or yield on equity or opportunity cost of deferring current consumption into the future”. This definition clearly shows That interest is a concept which can accommodate different meanings depending on the perspective it is viewed.

2.2 Trade Openness

Admittedly, trade openness can be used as an indicator of macroeconomic volatility, for example, Eiji (2017) asserted that the macroeconomic interpretation of the trade openness variable is that it measures the extent to which a domestic economy is exposed to external shocks. To the extent that if an economy relies on export demand and imported inputs/products, such economy is subject to potential transmission of disturbances from abroad. Thus, external shocks/disturbances inherited from abroad my affect macroeconomic volatility as well as stock market liquidity since trade openness has statistical significant relationship with GDP (Iyoha & Okim, 2017; Kim, Lin & d Suen, 2016 & Manwa & Wijeweera, 2019).

2.3 Stock market liquidity stock market refers various channel through which the shares of a public held company are bought and sold. Such financial activities are conducted under a given set of regulations (James, 2022). The market moves excess funds from savers (surplus unit) to institutions (deficit unit) which then invest them into productive use.

2.4Traded Value/GDP: Traded value as a volume-based indicator, are used mostly in measuring the breadth of the market – a very minimal effect of orders on price even when those orders are both numerous and large in value and is obtained by dividing the total value of shares traded on the stock market by GDP.

2.5Turnover Ratio: Turnover ratio as an indicator of stock market liquidity measures the number of times the outstanding volume of shares changes hands and can complements traded value/GDP in some case. It is obtained by dividing the value of total shares traded by the stock market capitalization.

2.6 Money Supply

Money literally consists of the legal tender of a country and all other liquid financial instruments flowing in the economy at a particular point in time. It may also consist of the money in form of short-term investments, the coins and notes currency, safe assets, cash and bank balance held in savings and current accounts.

2.7**Exchange rate**

Exchange rate is the rate at which one currency is being exchange with another currency (Mohan & Chitradevi, 2014). In another word," the price paid for a country's currency relative to another country's currency is known as exchange rate" (Olweni & Omondi, 2011).

2.9 Macroeconomic environment and the Stock Market

Understanding the relationship between macroeconomic volatility and stock market is crucial for investors because macroeconomic factors play a vital role in the performance of stock market. Many factors can make businesses or firms who take part in economic activities to expect either high or low return when investing in stock market and one of these factors are macroeconomic variables volatility. Changes in any of these variables can significantly affect stock market which also mean the return of an investment portfolio (Styliani, 2017).

2.10 Interest Rates and the Stock Market

There is plethora of studies in both developed and developing economy that stressed the link between interest rate and stock market. Monetary policy used interest rate as tool to either increase or decrease the quantum of

money in an economy. Thus, raised the concern of regulators and investors about the pressing need to educate the stakeholders on the impact of interest rates fluctuations (Sammyjo, 2022).

2.11 Theoretical Review

2.11.1 Capital Asset Pricing Model

The Capital Asset Pricing Model (generally known as CAPM) was developed in the 1960s by Sharpe (1964) it is based on the portfolio theory introduced by Markowitz (1952). According to Sharpe, diversification gives the investor the opportunity to minimize all portfolio risk, except the risk deriving from fluctuations in economic activity. This risk, the systematic risk, grows with the addition of an individual stock and depends on the response to the economic and political environment.

2.12 Empirical Reviews

Yeoh and Suhal (2019) investigated the effects of money supply, exchange rate and interest rate spread towards the performance of stock market in Malaysia. The study employed monthly data, from January 1997 to August 2018. Method analysis was the autoregressive distributed lag (ARDL) and GARCH model. The results showed that the money supply, real effective exchange rate, interest spread, had a long-run effect on the performance of the stock market.

Demir (2019) examined the impacts of some prominent macroeconomic factors on the Turkish Stock Market index, BIST-100 (Borsa Istanbul-100) over the 2003Q1–2017Q4 period using Autoregressive Distributed Lag (ARDL) Model. The study found that economic growth, the relative value of the domestic currency; portfolio investments and foreign direct investments raise the stock market index while interest rate and crude oil prices negatively affect it.

Megaravalli and Sampagnaro (2018) studied the long-run and the short-run relationship between India, China and Japanese stock markets and key macroeconomic variables such as exchange rates and inflation (proxied by consumer price index) of the three ASIAN economies (India, China and Japan). The study used monthly time series data spanning the period from January 2008 to November 2016. Unit root test, the co-integration test, Granger causality test and pooled mean group estimator were employed to obtain the long-run and short-run relationships. The findings of pooled estimated results of the three ASIAN countries show that exchange rate has a positive and significant long-run effect on stock markets while the inflation has a negative but not significant long-run effect.

Udoka, Nya and Bassey (2018) examined the effect of macroeconomic determinants of stock price movements in Nigeria using data on macroeconomic variables such as gross domestic product, exchange rate, inflation, interest rate and absolute stock price. The autoregressive distributive lag (ARDL) model was employed in the study. The ADF unit root test revealed that only interest rate was stationary at levels while the remaining variables became stationary when differenced once. The ARDL findings revealed that the determinants variables (GDP, EXCHR, INTR, and INFL) were not jointly co-integrated with the dependent variable, ASTP, hence, no existence of a long run relationship. The study concluded that there was no long run relationship between macroeconomic determinants and stock price movements in Nigeria.

John (2019) examined the effect of macroeconomic variables on stock market performance in
Nigeria using annual time series data spanning 1981 to 2016. The study employed Ordinary Least Square (OLS) regression technique and negative effect on stock market performance (represented by market capitalization) in the results showed that money supply has a significant positive effect; interest rate has a significant Nigeria. The study also found that exchange rate and inflation rate have no statistical significant effect on stock market performance in Nigeria.

Uhumnwangho (2022) examine the volatility of African Stock Markets and the factors influencing it in Africa. The Generalized Autoregressive Conditional Heteroscedasticity (GARCH) was used to generate the volatility, and the Generalized Method of Moments was applied on dynamic panel model to examine the factors that account for volatility in Africa. Sixteen (16) African Stock Markets were covered for the period 2013 to 2019. Data was sourced from African Securities Exchanges Association, Bank for International Settlements and World bank development Indicators databases. The study found that macroeconomic instability and financial liquidity variables determine stock market volatility in Africa.

Siddiqi et. at (2021) Examine how much stock liquidity is influenced by macroeconomic variables in case of Pakistan. For this purpose, time series data is used for analysis by considering liquidity in Pakistan stock exchange using time span from 2016 to 2020. In making an econometric model to analyze the impact on stock market liquidity, the following indicators such as industrial production growth rate, inflation, exchange rate and military expenditures are involved to make the model more realistic and statistically significant. In order to measure relationship, reliability and causality, regression technique is utilized by using quantitative data. After analyzing the results, in the end of the study the policies and implication are given in the shape of recommendation for corrective measures.

Shehwar (2020) examined the influence of macro-economic variables on to the stock markets of emerging and developed economies. Secondary data is used for this research process. The data of stock prices is extracted from the stock exchanges of the respective countries. The stock prices are used to calculate the stock returns. Selected independent macro-economic variables' data is taken from the website of international financial statistics. The time period of the collected data is from 2003Q1 to 2018Q4. Hypotheses are tested to figure out whether there is any significant linkage between stock returns and macro-economic variables. In order to test this relationship, Regression Analysis is employed. The results indicate that exchange rate, interest rate and inflation growth have significant linkage with the stock returns. Stock return's relationship with Industrial growth is not significant.

2.13 Research Gap

Developing African Economies with its peculiarities is associated with poor stock markets, lack of invest able funds, poor trading and low level of daily stock transactions, hence this study.

3.0 METHODOLOGY

3.1 Design: This research study was structured to capture the relationships that exists on the macroeconomic volatility and interest rate differential on stock market liquidity which implied that ex-post facto and analytical research design were used. Also, Ex-post fact o research design means

"after the fact" implying that the study would be carried out to identify the specific outcomes without manipulating the independent variables (Onwumere, 2021).

3.2 Data Description and Sources

The study relies extensively on secondary data which will be obtained from world bank development indicator of the selected two countries from 1986-2022. The motivation to use secondary data is in the fact that the study being based on historical research that requires past quantitative data to test hypotheses. The various data were source based on the parameters of the variables. Macroeconomic volatility (MAVO) was measured using the standard deviation of the gross domestic product (GDP), the interest rate (INT) differential was measured with short-term interest rate and trade openness OPEN was measured with total trade (import + export) % GDP and stock market liquidity (STR) was proxied with stock turnover ratio and control variables are money supply (MOS) and exchange rate (EXR).

3.3 Dependent Variable

3.3.1 Stock Market Liquidity (STR):

A stock's liquidity generally refers to how rapidly shares of a stock can be bought or sold without substantially impacting the stock price. Liquidity enables investors to execute buy and sell orders at the desired price more efficiently. Liquidity helps increase the number of active participants in the stock market because you will easily find buyers to sell your assets.

3.4 Explanatory Variables

3.4.1 Macroeconomic Volatility (MAVO):

Macroeconomic volatility is defined as periods of unexpected boost and unpredictable sharp downward and upward movements of the macroeconomic variables. Macroeconomic volatility is measured by finding the standard deviation of the gross domestic product (GDP). In this study, macroeconomic volatility serves as key explanatory variable.

3.4.2 Interest Rate Differential (INT):

An interest rate differential (INT) weighs the contrast in interest rates between two similar interestbearing assets. Most often it is the difference between two interest rates. Traders in the foreign exchange market use of interest rate differentials when pricing forward exchange rates. Higher interest rates offer lenders in an economy a higher return relative to other countries. Therefore, higher interest rates attract foreign capital and cause the exchange rate to rise.

3.4.3 Trade Openness (OPEN):

Trade openness refers to the outward or inward orientation of a given country's economy. Trade openness is defined as the ratio of exports plus imports over GDP. Outward orientation refers to economies that take significant advantage of the opportunities to trade with other countries whereas inward orientation refers to economies that do not take advantage of the opportunity to trade with other countries. Trade openness serves as explanatory variable.

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3.5 Control Variables

3.5.1 Money Supply (MOS):

The money supply is the total amount of money—cash, coins, and balances in bank accounts—in circulation. The money supply is also defined to be a group of safe assets that households and businesses can use to make payments or to hold as short-term investments. It was included as a control variable because the supply of money can boost or decrease the stock market liquidity in the stock market.

3.5.2 Exchange Rate (EXR): an exchange rate is a rate at which one currency will be exchanged for another currency. The essence of employing exchange rate as a control variable is because it affects the prices of stock in the stock market as well as investment decisions of the investors.

3.5.3 Techniques of Data Analysis: The applied some diagnostic tests for the purpose of achieving validity and reliability. Application of co-integration causality test and OLS was effected to ensure a reliable result.

4.1 Unit Root Test

Statement of Hypothesis

H_0: Series has a unit root**, H_1:** $H_{0\ is}$ not true

Table 4.3

Unit Root Test Table

Variable	NIG			Order		SA			order	
	ADF sta	5% cri	P-Value	Intgrat.	Decision	ADF sta	5% crit	P-Value	Intgrat.	Decision
M Supp	-4.4059	-2.9763	0.0018	1(1)	Rej -null	-2.6206	-1.9539	0.0108	1(1)	Rej -null
Exc Rate	-5.5655	-2.9719	0.0001	1(1)	Rej- null	-4.6127	-2.9677	0.0010	1(0)	Rej- null
Imports	-4.5199	-2.9677	0.0013	1(0)	Rej- null	-6.2806	-2.9678	0.0000	1(0)	Rej- null
Exports	-6.0455	-2.9719	0.0000	1(1)	Rej-null	-5.3716	-2.9919	0.0002	1(1)	Rej-null
Stock T	-2.3568	-2.0063	0.0270	1(1)	Rej- null	-6.2807	-2.9678	0.0000	1(0)	Rej- null
GDP	-4.5109	-2.9678	0.0013	1(1)	Rej-null	-5.0231	-2.9678	0.0003	1(0)	Rej-null
Int. Rate	-5.5931	-2.9484	0.0000	1(1)	Rej-null	-6.1112	-3.5366	0.0001	1(1)	Rej-null
Net_Tra	-5.0207	-2.9389	0.0002	1(0)	Rej-null	-2.5213	-1.9501	0.0131	1(0)	Rej-null

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The study observed that from table (4.3), the constant and trend were not absolutely restricted simply because some trends were not statistically significant at 5% level, while some are. Since some of their respective probability values are not greater than 5% significance, therefore we failed to ignored them by choosing (at intercept or trend or both). There is no evidence of unit root among the series as tested since the probability value of t-statistics is less than 5% significant level in both countries under study. The (ADF) results or values are more negative than the critical values at 5% level in absolute terms. The series are said to be stationary at this point since there is no evidence of unit root therefore the null hypothesis (presence of unit root) is not accepted. The order of integration in both countries are similar while achieving stationary level for all the variables therefore, we apply bounds co-integration test so as to identify the nature of their long run relationship or association.

Test for Co-integration

Statement of Hypothesis

H_0: Series is not co-integrated

H_1: H_0 is not true

Decision Criteria: Reject the null hypothesis if the calculated F-statistics is greater than i(1) bounds at 5% level of significance, otherwise accept the null hypothesis.

Table 4.5

Bounds Co-integration Test Table

NIG	FStat@ 5%	i(1) bounds	i(0) bounds	Result	SA	GStat@ 5%	i(1) bounds	i(0) bounds	Result
Model one	3.13	3.67	2.79	Accept H0	**Model one**	3.10	3.67	2.79	Accept H_0
Model Two	1.44	3.67	2.79	Accept H_0	**Model Two**	2.31	3.67	2.79	Accept H_0

The results of table 4.5 indicates that there is no evidence of co integration among the variables. All the outcome from model one, two and three show that the value of Statistics is not greater than i (1) bounds and this gave rise to acceptance of null hypothesis. This implied that long run relationship does not exist among the variables, hence the need for short run causality test.

Test for Short run Causality (wald Test)

Statement of hypothesis

H_0: C(2) =C(3)= C(4) =0 H1: C(2) =C(3) = C(4) ≠0

Decision criteria: Accept the null hypothesis if C(2)=C(3)= C(4) = 0, otherwise reject the null.

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Using model one = stock c gdp money exch Table 4.6 (Nig)

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	2.160340	(3, 15)	0.1353
Chi-square	6.481019	3	0.0904

Null Hypothesis: C(2)=C(3)=C(4)=0 Null Hypothesis

Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(2)	0.483131	0.690262
C(3)	-0.183440	0.314894
C(4)	-0.052686	0.037781

Restrictions are linear in coefficients.

Table 4.6 as displayed above ,where the value of F-statistic is 2.160340,Chi-square is 6.481019 with corresponding probability of 0.1353 and 0.0904 respectively are not equal to zero.This implied that c(2)=c(3)=c(4) is not equal 0 .The study conclude that gross domestic product ,money supply and exchange rate cause the stock trade in the short run.It proves that short run causal effect exist among the variables .The study failed to accept the null hypothesis, stating that c(2)=c(3)=c(4) is not equal to zero.

Statement of hypothesis

H_0 : C(2) =C(3)= C(4) =0 H1 : C(2) =C(3) = C(4) ≠0

Decision criteria: Accept the null hypothesis if C(2)=C(3)= C(4) = 0, otherwise reject the null.

Using model two as stock traded= f(interest rate, money-supply, exchange rate) Table 4.7

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	2.691162	(3, 15)	0.0835
Chi-square	8.073487	3	0.0445

Null Hypothesis: C(2)=C(3)=C(4)=0 Null Hypothesis

Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(2)	0.032036	0.472958
C(3)	-0.509260	0.367711
C(4)	-0.043623	0.016788

Restrictions are linear in coefficients.

Table 4.7 as indicated above displayed the value of F-statistic as 2.691162, Chi-square as 8.073487 with corresponding probability of 0.0835 and 0.0445 respectively which are not equal to zero. This implied that c(2)=c(3)=c(4) is not equal 0. The study concludes that interest rate, money supply and exchange rate cause the stock trade in the short run. It proves that short run causal effect exist among the variables. The study failed to accept the null hypothesis, stating that c(2)=c(3)=c(4) is not equal to zero.

S/A

Statement of hypothesis

H_0: C(2) =C(3)= C(4) =0 H1: C(2) =C(3) = C(4) ≠0

Decision criteria: Accept the null hypothesis if C(2)=C(3)= C(4) = 0, otherwise reject the null.

Using model One as stock traded =f(GDP, money-supply, exchange rate) Table 4.9

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	10.54262	(3, 24)	0.0001
Chi-square	31.62786	3	0.0000

Null Hypothesis: C(2)=C(3)=C(4)=0 Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(2)	0.693709	0.624503
C(3)	0.300539	0.176659
C(4)	-0.200059	0.067709

Restrictions are linear in coefficients.

Table 4.9as indicated above displayed the value of F-statistic as 10.54262,Chi-square as 31.62786 with corresponding probability of 0.0001 and 0.0000 respectively which are not equal to zero in absolute terms .This implied that c(2)=c(3)=c(4) is not equal 0 .The study conclude that gross domestic product ,money supply and exchange rate cause the stock trade in the short run.It proves that short run causal effect exist among the variables. The study failed to accept the null hypothesis, stating that c(2)=c(3)=c(4) is not equal to zero.

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Statement of hypothesis

H_0 : C(2) =C(3)= C(4) =0 H1 : C(2) =C(3) = C(4) ≠0

Decision criteria: Accept the null hypothesis if C(2)=C(3)= C(4) = 0,otherwise reject the null.

Using model two = stock traded=f(interest rate, money-supply, exchange rate) Table 4.10

Wald Test:

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	7.045950	(3, 23)	0.0016
Chi-square	21.13785	3	0.0001

Null Hypothesis: C(2)=C(3)=C(4)=0 Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(2)	-0.264152	0.653089
C(3)	0.078108	0.210369
C(4)	-0.212403	0.069081

Restrictions are linear in coefficients.

Table 4.10 as indicated above displayed the value of F-statistic as 7.045950, Chi-square as 21.13785 with corresponding probability of 0.0016 and 0.0001 respectively which are not equal to zero. This implied that c(2)=c(3)=c(4) is not equal 0. The study concludes that interest rate, money supply and exchange rate cause the stock trade in the short run. It proves that short run causal effect exists among the variables. The study failed to accept the null hypothesis, stating that c(2)=c(3)=c(4) is not equal to zero.

Test For Multi- collinearity

Decision criteria: If the value of centered variance inflation factor (CVIF) is less than ten (10), there is no evidence of multi-collinearity on the explanatory variables.

Table 4.12

NIG Variables	Uncentered VIF	Centered VIF	Multi-co linearity	SA Variables	Uncentered VIF	Centered VIF	Multi-co linearity
MAVO	3.31492	1.25346	Absent	MAVO	1.675603	1.027255	Absent
MOS	14.32433	1.43485	Absent	MOS	70.18831	1.760174	Absent
EXR	8.879076	1.41511	Absent	EXR	29.92147	1.725551	Absent
INT.rate	7.653061	1.21972	Absent	INT.rate	38.25001	1.965012	Absent
T -Open	3.33897	1.03567	Absent	Open	2.21128	1.76461	Absent

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Table 4.12 as indicates that the value of centered variance inflation factor (CVIF) for South Africa (SA) on these variables (mavo, mos, Exch rate, Int rate and trade -open) are 1.027255,1.760174,1.725551, 1.965012 and 1.76461 respectively. We observed in absolute terms that all the values are said to be less than ten (10)

On the same table 4.12, we observed that for Nigeria (mavo,mos,Exch rate, Int rate and tradeopenness), have their corresponding centered variance inflation factor (CVIF) values as

1.25346,1.43485,1.41511,1.21972 and 1.03567 respectively which is less than ten (10)

Test for ARCH Effect

Statement of Hypothesis

H_0: No ARCH effect

H_1: H_0 is not true

Decision Critera: Accept the null hypothesis if $b_1 = b_2 = b_3 = 0$,otherwise reject the null in favour of the alternate hypothesis.

Table 4.13

ARCH Effect Table

NIG	**MAVO(-1)**	**Decision**	**SA**	**MAVO(-1)**	**Decision**
F-Stat	0.325289		F-Stat	0.139349	
Obs. R^2	0.345983	Accept null	Obs. R^2	0.149268	Accept null
Prob F(1,26	0.5733		Prob F(1,26)	0.7120	
Prob. ChiSq	0.5564		Prob. ChiSq	0.6992	
	Interest Rate(1)			Interest Rate (1)	
F-Stat	0.050955		F-Stat	1.815575	
Obs. R^2	0.053788		Obs. R^2	1.824670	
Prob F(1,26	0.8227	Accept null	Prob F(1,26	0.1865	Accept null
Prob .ChiSq	0.8166		Prob .ChiSq	0.1765	

Source: Researchers computation

Table 4.13 indicate that probability values of F-statistics and that of Obs.R^2 on MAVO and Interes rate in both countries are (Nigeria -MAVO P-value of F-stat =0.5733 and P-value of Chi sq=0.5564). In similar manner South African activities were observed on the same table as (South Africa -MAVO P-value of F-stat =0.7120 and P-value of Chi sq=0.6992). The result or the outcome on the variable is said to be statistically not significant, since it is neither equal to zero nor less than 5% level of significance.

On the same table 4.13 the Interest rate differential on both countries are said to be statistically not significant, since the probability values of all the outcomes in absolute terms are neither equal to zero nor less 5% level of

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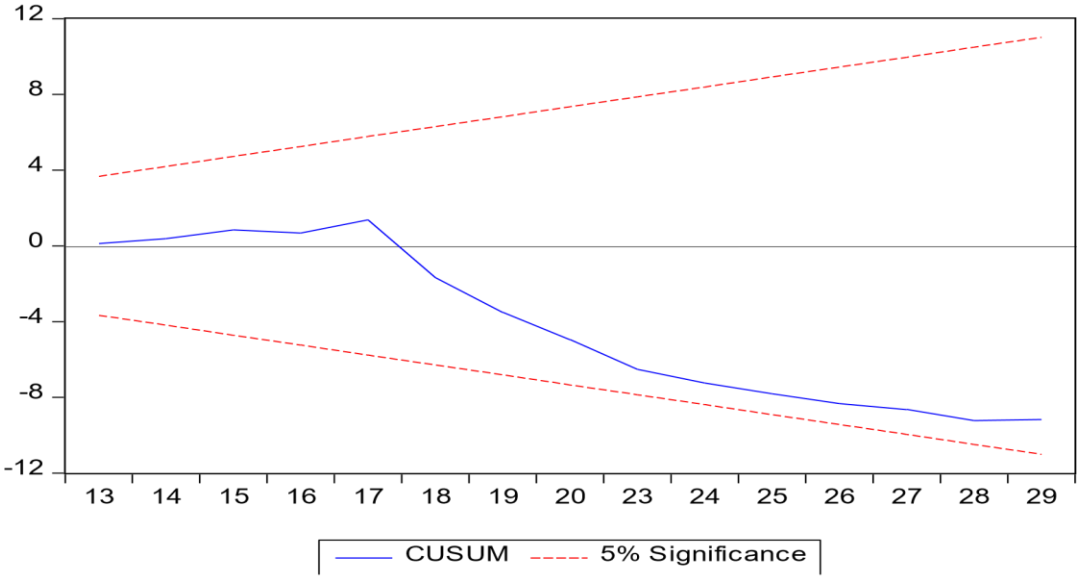
significance. Based on these observations, the study opted for the use of Fixed and random Effect estimation for the purpose of eliminating co-llinrearity of explanatory variables, since there is no presence of ARCH effect, therefore no need of ARCH model **Parameter Stability Test**

Figure 1 Nigeria

Model one



Figue 2

Model One

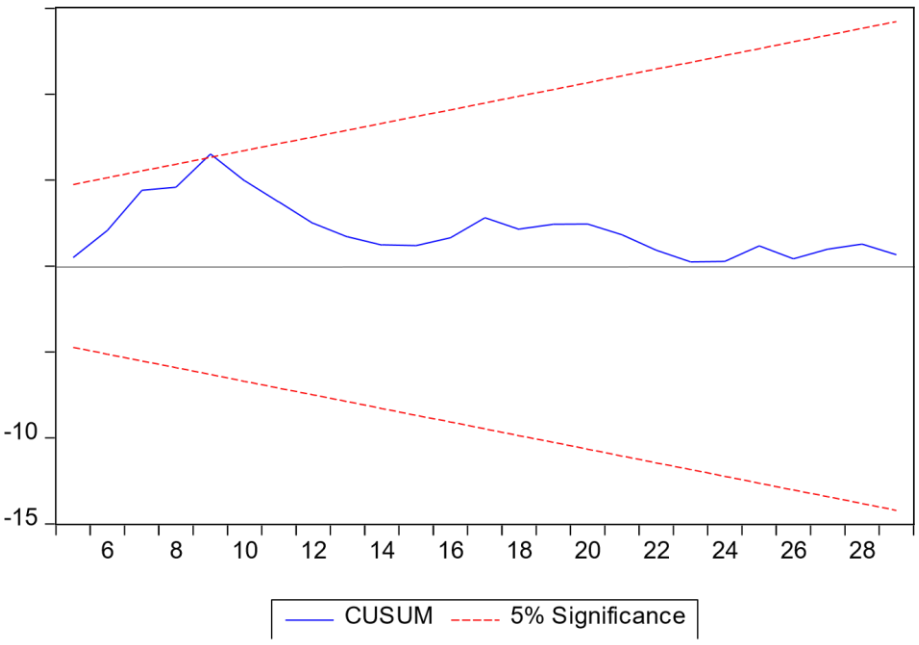


Figure 1 South Africa

15
10
5
0
-5

Figure 2

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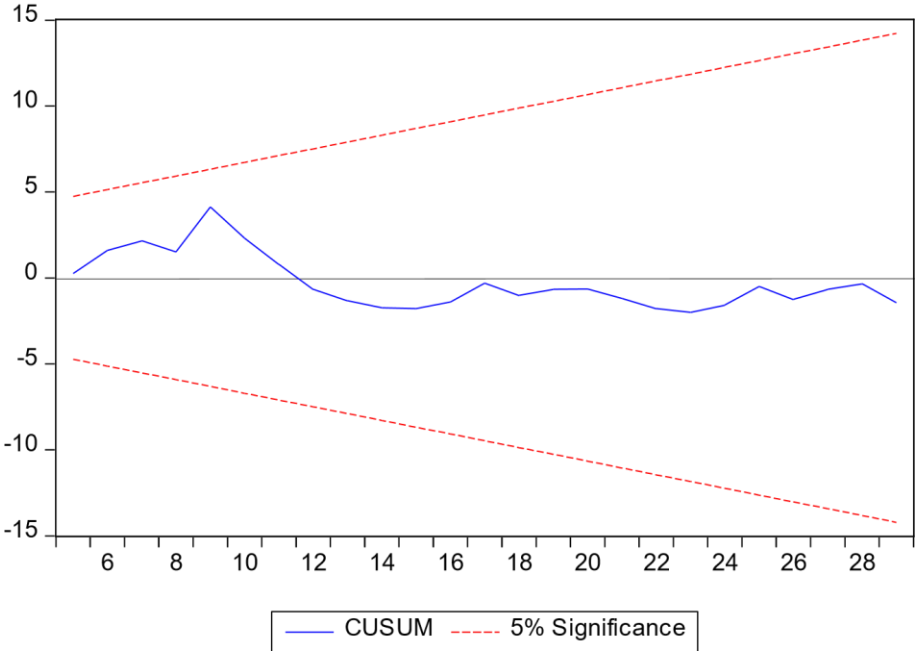
Model Two



Test of Hypotheses

Test of Hypothesis one

Statement of Hypothesis in Null Form

H_0: Macroeconomic volatility did not have positive and significance effect on the stock market liquidity in Nigeria and South Africa

Decision Criteria: Accept the null hypothesis if the coefficient of the explanatory variable is negatively signed and the probability value is not less than 5% level of significance, otherwise reject the null. This condition is applicable to other hypothesis.

MODEL ONE ($STR_{it} = \beta_1 MAVO_{it} + \beta_2 MOS_{it} + \beta_3 EXR_{it} + \mu_{it}$)

Table 4.14 Multiple Regression Table (OLS)

Variables	Coeffients	T-statistic	P values	R2	Aj R^2	P(f-stat	D W
STR	21.9275						
(MAVO)	0.207102	0.500124	0.6203	75%	73%	0.0000	1.33
MOS(1)	0.317342	2.026678	0.0508				
EXS(1)	-0.347620	-4.632320	0.0001				
Nigeria	Coeffients	T-statistic	P values	R2	Aj R^2	P(f-stat	D W
STR	-7.055453			0.66	0.60	0.0029	2.056
(MAVO)	1.571131	4.428479	0.0004				
MOS(1)	0.59600	3.129771	0.0061				

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EXS(1)	-0.00605	-0.25013	0.7995				

Researchers computation

STR_{it} = Stock market liquidity, $MAVO_{it}$ = Macroeconomic volatility = Money supply EXS= Exchange rate MOS_{it}

Interpretation of Results South Africa:

From the table 4.14, the interpretation of the result as regards the coefficient of various regressors is stated as follows: The value of the intercept is 21.9275; it shows that stock market liquidity (STR) will experience a 21.92% increase when all other variables are held constant. The estimate coefficients which are 0.207102 {MVO} shows that a unit increase in macroeconomic volatility will cause a 0.21% increase in stock market liquidity (STR), 0.3173% {MOS} shows that a unit increase in money supply will cause a 0.3173% increase in stock market liquidity (STR), 0.347620 {EXS} shows that a unit change in exchange rate will cause a -0.347% % decrease in stock market liquidity (STR).

The $R^{2\ of}$ 75% implied that variation caused by (MVO) stock market volatility (STR) was explained by 75%, while the remaining 25% represents unexplained variables not included in the model and was taken care of by the error term. Adjusted R^2 in the result shows 73% as the best fit of the model for the explanatory variable tested. There is evidence of positive autocorrelation, since DW statistic is1.33. The p-value of f-statistic is 0.0000 and concludes that the overall estimate is statistically significant.

Decision: The study fail to accept the null hypothesis, since the coefficient value of the explanatory variable is positively signed (0.207102), indicating a positive impact on stock market liquidity; though not significant, the study therefore conclude that Macroeconomic volatility have positive and non-significance effect on the stock market liquidity in South Africa.

Nigeria:

From the table 4.14, the interpretation of the result as regards the coefficient of various regressors is stated as follows: The value of the intercept is -7.055453; it shows that stock market liquidity (STR) will experience a 7.055% decrease when all other variables are held constant. The estimate coefficients which are 1.571131 {MVO} shows that a unit increase in macroeconomic volatility will cause a 1.57% increase in stock market liquidity (STR), 0.59600% {MOS} shows that a unit increase in money supply will cause a 0.59% increase in stock market liquidity (STR), -0.006058 {EXS} shows that a unit change in exchange rate will cause a -0.006% % decrease in stock market liquidity (STR).

The $R^{2\ of}$ 66% implied that variation caused by (MVO) stock market volatility (STR) was explained by 66%, while the remaining 34% represents unexplained variables not included in the model and was taken care of by the error term. Adjusted R^2 in the result shows 60% as the best fit of the model for the explanatory variable tested. There is evidence of positive autocorrelation, since DW statistic is2.056. The p-value of f-statistic is 0.000290 and concludes that the overall estimate is statistically significant.

Decision: The study fail to accept the null hypothesis, since the coefficient value of the explanatory variable is positively signed (0.59600), indicating a positive impact on stock market liquidity and significant, the study

therefore conclude that Macroeconomic volatility have positive and significance effect on the stock market liquidity in Nigeria**.**

Test of Hypothesis Two

Statement of Hypothesis in null form

H_0: Interest rate differentials did not have positive and significance impact on stock market liquidity in South Africa.

Table 4.15 Multiple Regression Table (OLS)

Variables	Coeffients	T-statistic	P values	R2	Aj R^2	P(f-stat	D W
STR	32.2550			0.73	0.70	0.0000	1.04
INT RATE	-0.35759	-0.53762	0.5943				
MOS(1)	0.32828	1.63510	0.1113				
EXS(1)	-0.25395	*3.96832	0.0004				
Nigeria	Coeffients	T-statistic	P values	R2	Aj R^2	P(f-stat	D W
STR	-6.121344			0.32	0.20	0.077	1.05
INT RATE	-0.006386	-1.086833	0.2923				
MOS(1)	10.82669	2.171246	0.04444				
LNEXS(1)	-3.257574	-0.675649	0.5084				

Researchers computation

STR_{it}= Stock market liquidity,INT_{it} = Interest Rate Differentials, MOS = Money supply EXS= Exchange rate

Interpretation of Results

South Africa

From the table 4.15, the interpretation of the result as regards the coefficient of various repressors is stated as follows: The value of the intercept is 32.2550; it shows that stock market liquidity (STR) will experience a 32.25% increase when all other variables are held constant. The estimate coefficients which are -0.35759 {INT} shows that a unit decrease in interest rate will cause a 0.35% decrease in stock market liquidity (STR), 0.32828% {MOS} shows that a unit increase in money supply will cause a 0.32828% increase in stock market liquidity (STR), -0.25395 {EXS} shows that a unit change in exchange rate will cause a -0.25% % decrease in stock market liquidity (STR).

The R^2 of 73% implied that variation caused by (INT) stock market volatility (STR) was explained by 73%, while the remaining 27% represents unexplained variables not included in the model and was taken care of by the error term. Adjusted R^2 in the result shows 70% as the best fit of the model for the explanatory variable tested. There is evidence of positive autocorrelation, since DW statistic is1.04. The p-value of f-statistic is 0.0000 and concludes that the overall estimate is statistically significant.

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Decision: The study accept the null hypothesis, since the coefficient value of the explanatory variable (bond rate) is negatively signed (-0.35759), indicating a negative impact on stock market liquidity; though not significant (0.5949), the study therefore conclude that bond interest rate have negative and non-significance effect on the stock market liquidity in South Africa.

Nigeria:

From the table 4.15, the interpretation of the result as regards the coefficient of various regressors is stated as follows: The value of the intercept is -6.121344; it shows that stock market liquidity (STR) will experience a 6.12% decrease when all other variables are held constant. The estimate coefficients which are -0.006 {INT} shows that a unit decrease in interest rate will cause a 0.006% decrease in stock market liquidity (STR), 10.82% {MOS} shows that a unit increase in money supply will cause a 10.82% increase in stock market liquidity (STR), -3.25{EXS} shows that a unit change in exchange rate will cause a -3.25% % decrease in stock market liquidity (STR). The $R^{2\ of}$ 32% implied that variation caused by (INT) stock market volatility (STR) was explained by 32%, while the remaining 68% represents unexplained variables not included in the model and was taken care of by the error term. Adjusted R^2 in the result shows 20% as the best fit of the model for the explanatory variable tested. There is evidence of positive auto correlation, since DW statistic is1.05. The p-value of f-statistic is 0.07 and concludes that the overall estimate is not statistically significant.

Decision: The study accept the null hypothesis, since the coefficient value of the explanatory variable (bond rate) is negatively signed (-0.006), indicating a negative impact on stock market liquidity; though not significant (0.2923), the study therefore conclude that bond interest rate have negative and non-significance effect on the stock market liquidity in Nigeria.

5.1 Findings

The findings emanating from the impact of macroeconomic volatility and interest differentials on stock market liquidity are as follows:

(i) Macroeconomic volatility have a positive and significance effect on the stock market liquidity in Nigeria, while in South Africa, Macroeconomic volatility have positive and non-significance effect on the stock market liquidity.

(ii) Interest rate have a negative and non-significance effect on the stock market liquidity in South Africa and Nigeria

5.2 Conclusion

Stock market refers various channel through which the shares of a public held company are bought and sold. Such financial activities are conducted under a given set of regulations. The market moves excess funds from savers (surplus unit) to institutions (deficit unit) which then invest them into productive use.

All the explanatory variables in this study have elasticity less than unity (Es< 1). This implies that a proportionate change in any of the independent (X's) variables will result in proportionate change on stock market liquidity. With the findings resulting from this study, the following conclusions are drawn viz

(i) Since the coefficient of **macroeconomic volatility** is–**0.207 and**. 1.57for South Africa and Nigeria respectively**,** it implies that a change in the volatility by1 % will result by the same margin to a fall or a rise in the level of stock market liquidity that would be experienced in the economic activity.

5.3 Recommendations

i. Government need to enact sound monetary policies in order to enhance economic growth in both countries under study. The government will also need to benchmark for best practices in monetary policy development from those economies that are more advanced in order to develop better monetary policies that can improve the performance of the stock market.

ii. The government need to create an enabling environment and promote infrastructural development to facilitate the ease of stock market activities in particular and financial system of both countries.

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