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DETERMINANTS OF STOCK MARKET LIQUIDITY IN NIGERIA

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ABSTRACT

This paper examines the predictors of stock market liquidity in Nigeria. Using the autoregressive distributed lag (ARDL) bounds testing approach on monthly data series, the study finds evidence that stock market liquidity is enhanced with improved market performance and monetary interventions by the government. The study also finds that while liquidity persistence features in the market, high price levels impede market liquidity. However, no evidence is found for such persistence in the long run. Results obtained are robust to alternate specification of liquidity with the use of the AMIHUD illiquidity ratio. Policy holders and investors should consider the predictors documented in this study when making liquidity forecasts or investment decisions. This will assist to mitigate related risks, enhance market liquidity and consequently improve investors' confidence in the market.

***JEL classification**: G10, G15, G30.*
***Keywords**: AMIHUD illiquidity ratio; ARDL; equity returns; liquidity; stock market; trading volume.*

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1. INTRODUCTION

The role of stock market in the development of an economy cannot be overemphasized. Stock markets act as catalyst for enhancing economic growth through capital formation. For the effective discharge of this role, an essential feature of the market that must be ensured is liquidity. Levine (1991) describes liquidity as the ability to trade in equity easily without an adverse effect on prices.

The provision of liquidity is an important role that should be played by any stock market in the world. Through this, the stock market provides an outlet for ease of liquidating investment in securities. Extant literature (Amihud & Mendelson, 1986; Chordia et al., 2003; Correia & Amaral, 2014; Jacoby et al., 2000) shows that stock market liquidity influences asset prices and the efficiency of markets. Improved liquidity

of stock markets also leads to enhanced investment and capital flows. Market liquidity is also essential to financial system stability as liquid markets are more able to absorb systemic shocks. However, financial upheavals encountered in recent times suggest that the condition of financial markets can be so bad that liquidity will fall drastically or disappear totally. Such occurrences will have a detrimental effect on asset prices and market efficiency (Naik & Reddy, 2021; Rouetbi & Mamoghli, 2014; Wang, 2010). Intense volatility of prices can arise from market illiquidity.

One of the main causes of risk for investors in the equity market is the unpredictability of market liquidity (Choi & Cook, 2006). Thus, understanding the predictors of stock market liquidity can enhance investors' (domestic and foreign) confidence in the market. This will ultimately lead to efficient allocation of resources (Chordia et al., 2003; Naik & Reddy, 2021; Ochenge et al., 2020). Knowledge of the liquidity determinants is also very important to practitioners who need in-depth knowledge on the cross-sectional variation in stock liquidity.

The current study is motivated by different reasons. Firstly, extant literature shows that market liquidity is explained by several factors ranging from company fundamentals to economic factors. However, existing empirical works on liquidity have majorly focused on individual securities at the firm level. There is scant evidence that relates to liquidity at the market level. Secondly, most empirical studies on stock market liquidity have also focused on developed equity markets. There is a dearth of literature on emerging markets. The need for this line of research on emerging markets derives from the fact that such markets significantly attract foreign investment due to the likelihood of high returns. However, these "high returns" expected from emerging market needs are matched with high costs of liquidity in such markets which are generally illiquid. Thus, there is need to understand predictors of liquidity in an emerging market setting. More so, the risk of unpredictability of market liquidity is higher in emerging markets due to a greater level of information asymmetry. Results obtained in developed markets cannot be applied to an emerging market setting because economic and institutional characteristics differ across these two settings. According to the International Organization of Securities Commission (IOSCO, 2007), factors driving liquidity differ according to individual market's level of development. In the same vein, results obtained in one emerging market cannot be applicable to another. This is because monetary and fiscal measures adopted by the government are essential in explaining liquidity. Such policies differ across different countries. The scant studies on emerging markets have also been conducted in non-African countries. Thus, this study focuses on an African market.

Particularly, the motivation to study an African stock market derives from peculiar problems which make the region an ideal laboratory for this kind of study. Bright Africa (2019) opines that liquidity is drying up in African countries, as average daily turnover declined by 30% from 2018 to 2019. This is attributed to massive withdrawal of capital from such markets during the stated period. In addition, The Exchange (2020) notes that most stock exchanges in Africa have liquidity levels below 1%. Thus, the study focuses on Nigeria, which is an African market. To the best of the researcher's knowledge, no empirical evidence exists as to the predictors of market liquidity for the Nigerian market. Specifically, the focus on the Nigerian market is motivated by the trend analysis suggesting a low level of liquidity in recent years. This is confirmed by the graphical representation in Figure 1. The figure shows that trading volume, which is a reliable gauge of liquidity, is very low in recent years as compared to the earlier years. In addition to the trend revealed in Figure 1, The Exchange (2020) notes that share velocity is 5% in

Nigeria. This figure falls below that of Morocco (6%) and Mauritius (8%) even though Nigeria has more listed companies.

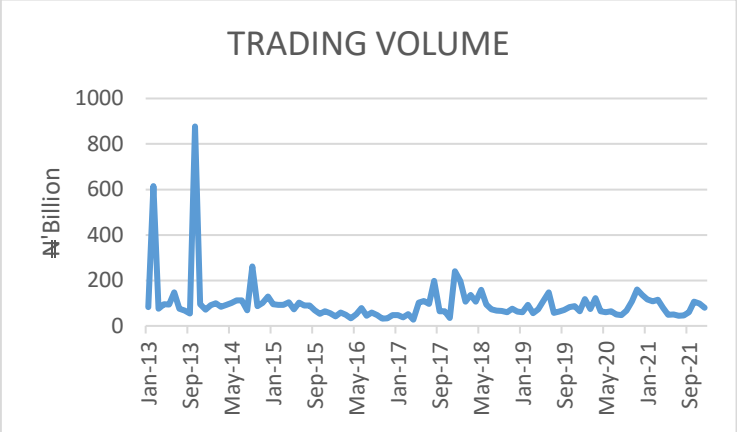

Figure 1: Trading volume on the Nigerian Exchange Group (NGX).

The study adds to the scant literature on the determinants of stock market liquidity in an emerging market setting, particularly in the African context. To the best of the researcher's knowledge, this study is novel, as no prior evidence exists on the predictors of stock market liquidity in Nigeria. The study also offers explanation on the determinants by measuring liquidity from the angle of its depth (trading volume) and breadth (AMIHUD illiquidity ratio). Most existing studies focus on one aspect. Examining both sides will deepen our understanding on the predictors of liquidity for the Nigerian market.

The remaining part of the article is arranged in the following way. Review of related existing empirical studies comes after this introductory part. Following the literature review is an explanation on the data and methods employed. A discussion of results is then presented, and the last section provides the concluding thoughts on the write-up.

2. LITERATURE REVIEW

Theoretically, the relationship observed in this study can be explained using one of the six tenets of the Dow theory, which suggests that "market trends are confirmed by volume". According to the theory, volume rises with increase in prices in an upward trend. Similarly, volume falls with decrease in prices when there is a downward trend in the market. Since trading volume is regarded as a good measure of liquidity, then the study postulates that liquidity (as measured by trading volume) will rise when there is an upward trend in the market, and will decline when there is a downward trend in the market. Empirical studies on liquidity can be classified into two; the studies that examine stock liquidity at the firm level and those that consider market liquidity as a whole.

2.1 Determinants of stock market liquidity (firm level)

At the firm level, extant literature reveals that corporate financial fundamentals play an essential role in explaining stock liquidity. Alnaif (2014) finds that firm size has a positive impact on stock liquidity proxies. Using market capitalization as a proxy for firm size, Camilleri and Galea (2019) contend that market capitalization is the factor that mostly explains the cross-sectional variation in trading activity. Several arguments have been advanced on the relationship between firm size and stock liquidity. Firstly, it is widely held that investors are attracted to larger firms. Secondly, it is believed that securities of

such firms are less susceptible to information asymmetry. Thus, higher trading activity, which suggests higher stock liquidity, will be expected from such firms. Contrarily, Madyan et al. (2013) report that firm size has a negative effect on stock liquidity. Some studies report that profitability positively affects stock liquidity (Beaupain & Juliet, 2011; Camilleri & Galea, 2019). These studies argue that investors will readjust their portfolio in line with profitability as shareholders buy stocks with the intention of benefiting from the earnings of the firm. Thus, higher profitability will lead to higher liquidity. Contrarily, Alnaif (2014) finds that a firm's profitability has a negative impact on stock liquidity proxies.

Researchers such as Griffin (2010) and Na'ura (2016) report a negative relationship between dividends and stock liquidity. This is premised on the fact that firms are believed to pay higher dividends as compensation for lower share liquidity. Similarly, Banerjee et al. (2007) opine that traders consider dividends and stock liquidity as substitutes. Alnaif (2014) finds no significant effect between dividends and stock liquidity proxies. Studies have also shown that leverage has a negative impact on stock liquidity (Camilleri & Galea, 2019; Lesmond et al., 2008). These studies contend that as firms add more debt to their capital structure, information asymmetry is increased, and this ultimately increases cost of stock liquidity. However, Alnaif (2014) finds no significant effect between a firm's leverage and stock liquidity.

Some studies find that the level of corporate disclosure has a positive effect on stock liquidity (Ajina et al., 2015; Alves et al., 2015). The authors argue that information asymmetry is reduced with high quality corporate disclosures. This will enhance investors' confidence and consequently improve market liquidity. Other factors that have been reported to affect stock liquidity at firm level include ownership concentration (Alves et al., 2015), intensity of insider trading (Degryse et al., 2016) and foreign ownership (Utami et al., 2020).

2.2 Determinants of market liquidity (market level)

Several factors have been reported to affect stock market liquidity. Bouchaddekh and Bouri (2014) report that past liquidity has a significant positive effect on current liquidity in the market. Similarly, Wuyts (2007) reports that liquid markets tend to attract even more liquidity. Similarly, Tayeh (2016) documents that market liquidity is enhanced with improved performance of the market. Specifically, past studies (Chordia et al., 2005; Goyenko & Ukhov, 2009; Miralles-Marcelo et al., 2015) report that equity returns (as measure of market performance) positively influence stock market liquidity. Contrarily, Bouchaddekh and Bouri (2014) find no evidence to show that returns influence liquidity of stock market.

Existing literature also shows that macroeconomic factors explain stock market liquidity. Miralles-Marcelo et al. (2015) find that money supply significantly affects market liquidity. Chordia et al. (2003) find that in normal times, liquidity is not affected by money supply. However, it is further found that increase in money supply raises stock market liquidity during crisis periods. Similarly, Fernandez-Amador et al. (2011) report that a rise in the growth rate of monetary base increases stock market liquidity. These authors contend that credit constraints encountered by investors are loosened when money supply increases. Consequently, this will have a beneficial effect on the liquidity of the financial market, as trading activities will be enhanced. Therefore, increase in money supply by the government will enhance higher order inflows into the stock market. This will lead to an upsurge in market liquidity. Unlike studies that find money supply to

be important in predicting liquidity, Siddiqi et al. (2021) document that money supply does not affect market liquidity in any way.

Government expenditure also affects market liquidity (Chowdhury et al., 2018). This assertion is premised on the fact that flow of money is facilitated in the economy when there is a rise in government spending. Researchers such as Ochenge et al. (2020) and Siddiqi et al. (2021) report that currency depreciation leads to significant reduction in liquidity of stock markets. Contrarily, Jameel and Hayee (2007) find that exchange rate has no relationship with stock market liquidity. Jepkemei (2017) reports that inflation has a negative influence on stock market liquidity, while Jameel and Hayee (2007) find no evidence to show that inflation rate affects stock market liquidity. Marozva (2020) opines that stock market liquidity is time-dependent. Many studies report significant decline in market liquidity in periods of crisis (Blanchard et al., 2010; Choi & Cook, 2006; Chowdhury et al., 2018; Soderberg, 2008). Thus, crisis is said to increase market illiquidity.

Summarily, there is need for more empirical evidence on stock liquidity as it applies to the whole market. More so, the few studies that have studied liquidity at the market level concentrate on developed markets and few emerging markets. To the best of the researcher's knowledge, there is a dearth of evidence on the subject matter as it relates to African markets, specifically the Nigerian market.

3. DATA AND METHODOLOGY

This study covers the period January 2013-December 2021 in the Nigerian stock market. The persistent fluctuations in stock market and economic fundamentals during this period make it appealing for explaining market liquidity. Time-series data is employed using monthly frequency. Data relating to the stock market are obtained from the Nigerian Exchange Group (NGX) website, while macroeconomic data are sourced from the website of the Central Bank of Nigeria.

3.1 Model specification and variable measurement

The study models liquidity as a function of the explanatory variables in the models specified below. Explanatory variables are selected based on what has been proven in the literature to be related to stock liquidity. This is done to ensure that the model is correctly specified. While ensuring that there is no omission of important variables, the study also tries to avoid overfitting the model by including too many variables. Therefore, the most important variables established in the literature as determinants of stock liquidity are selected. In addition, the study includes COVID-19, which to the best of our knowledge has not featured in most existing studies. This variable is included as anecdotal evidence suggests that many stock markets are adversely affected by the health pandemic.

$$TV = f(TV\_1; SR; MS; INF; INT; EXC; CVD) \quad (1)$$

$$AMIHUD = f(AMIHUD\_1; SR; MS; INF; INT; EXC; CVD) \quad (2)$$

This study measures liquidity from two dimensions: depth and breadth. From the dimension of "depth", the study employs trading volume (TV) as a measure of stock market liquidity in model 1. Trading volume (TV) is defined as natural logarithm of cash trading volume (the cash trading volume is the number of shares traded * prices of the shares). Past studies (Alzahrani, 2011; Amihud, 2002; Amihud & Mendelson, 1986,

2008; Chordia et al., 2003; Jones, 2002; Lo & Wang, 2000; Naik et al., 2020; Rosu, 2020) support the use of trading volume, as they show that the two concepts are closely interrelated. A higher trading volume suggests higher liquidity.

For the purpose of further check, the study also measures liquidity from the dimension of market breadth. Market breadth is proxied as Amihud's Illiquidity Ratio (AMIHUD). This ratio relates the absolute change in the price of security *x* to the volume traded.

$$R_{it}/V_{it}$$

Where: $r_{i,t}$ = stock returns (the percentage change in the price of security I between day t-1 and day t)

V_{it} = trade volume (the standardized total volume of asset I exchanged on day t)

AMIHUD can be regarded as an illiquidity proxy, as a fall in Amihud ratio indicates higher liquidity.Therefore, this study adopts trading volume and the Amihud's illiquidity ratio as measures of liquidity, unlike most previous studies that employ the bid-ask spread. This is due to the fact that the bid-ask measure has been criticized on the grounds that it only measures liquidity when the security dealer crosses a trade at the bid and ask concurrently (Grossman & Miller, 1988; Stoll, 1989).

Stock return (SR) is included as a possible predictor to examine the effect of market performance on market liquidity. Stock return is measured as the difference in the log value of price index at time t and time t-1. TV_1 (AMIHUD_1) is included in the model to test for liquidity persistence in model 1 (model 2). This will show whether current liquidity is explained by past liquidity. The study also checks for the effect of macroeconomic fundamentals on stock market liquidity by including the following variables: money supply (MS), inflation (INF), interest rate (INT) and exchange rate (EXC). Money supply is measured as the broad money supply in circulation. Inflation is measured using the given rate (in percentage) which shows the changes in price during the period. Interest rate is measured as the monetary policy rate, while exchange rate is measured as the relative price of the Nigerian currency (naira) to the US dollar in nominal value. Finally, the study tests for the effect of the COVID-19 pandemic on stock market liquidity. In order to achieve this, COVID-19 is measured as a dummy variable, with values of 0 for data points before the emergence of the pandemic (January 2013-January 2020). All data points from the onset of the pandemic are labeled as 1 (February 2020-December 2021). For the purpose of clarity, a summary of the variables explained above and their measurements is depicted in Table 1.

Table 1: Summary of variables and measurement.

Variables	Measurement
Trading Volume (TV)	Natural logarithm of cash trading volume (the cash trading volume is the number of shares traded * prices of the shares)
Amihud's Illiquidity Ratio (AMIHUD)	Absolute change in the price of security *x* divided by the volume traded
Stock returns (SR)	Stock return is measured as difference in the log value of price index at time t and time t-1
Money supply (MS)	The total broad money supply in circulation

Inflation (INF)	Given rate (in percentage) which shows the changes in prices during the period
Interest Rate (INT)	Monetary policy rate (annual rate at which the Central Bank lends to other banks)
Exchange Rate (EXC)	Relative price of the Nigerian currency (naira) to the US dollar in nominal value
COVID-19 (CVD)	Dummy variable with values of 0 for data points before the emergence of the pandemic (Jan 2013-Jan 2020). All data points from the onset of the pandemic are labeled as 1 (Feb 2020-Dec 2021)

The study employs the autoregressive distributed lag (ARDL) approach to determine whether there is a long-run association between stock market liquidity and the predictors. The unrestricted model for bounds testing is specified below.

$$\Delta LIQ_t = \beta_0 + \sum_{j=1}^{n} \Sigma\beta_1 \, \Delta LIQ\_1_{t-j} + \sum_{j=0}^{n} \beta_2 \, \Delta SR_{t-j} + \sum_{j=0}^{n} \beta_3 \, \Delta MS_{t-j} + \sum_{j=0}^{n} \beta_4 \, \Delta INF_{t-j} + \sum_{j=0}^{n} \beta_5 \, \Delta INT_{t-j} + \sum_{j=0}^{n} \beta_6 \, \Delta EXC_{t-j} + \sum_{j=0}^{n} \beta_7 \, \Delta CVD_{t-j} + \gamma_1 LIQ\_1_{t-1} + \gamma_2 SR_{t-1} + \gamma_3 MS_{t-1} + \gamma_4 INF_{t-1} + \gamma_5 INT_{t-1} + \gamma_6 EXC_{t-1} + \gamma_7 CVD_{t-1} + \varepsilon_t \quad (3)$$

Where LIQ = lnTV (model 1), LIQ = AMIHUD (model 2), n = optimum lag length, Δ = first difference operator, β_0 = constant term, $\beta_1 \ldots \beta_7$ = short-run coefficients, $\gamma_1 \ldots \gamma_7$ = long-run coefficients and ε_t = error term.

Due to its applicability to different orders of integration, the study adopts the ARDL approach of Pesaran et al. (2001). The bounds testing approach is therefore employed in ascertaining the long-run relationship between stock market liquidity and the predictors. The null hypothesis, which states a lack of conitegration, is compared against the alternate, which states that there is a long-run relationship among the variables. A test of the hypothesis is done by estimating equation 3 and comparing the F-statistic estimates with the two critical values, as given by Pesaran et al. (2001). The decision rule is that if the F-statistic is higher than the upper critical value, the null hypothesis will not be accepted, and this indicates cointegration. On the other hand, if the F-statistic is lower than the lower critical value, the null hypothesis will be accepted, and this indicates absence of cointegration. The results will be inconclusive if the F-statistic falls within the upper and lower critical values.

4. RESULTS AND DISCUSSION

4.1 Regression results

Stationarity testing is conducted to ascertain the order of integration of the series and to avoid reporting of spurious estimates. In order to achieve this, the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests are employed. Higher order autocorrelation and heteroscedasticity issues are addressed by employing the PP test. Estimates of the unit root tests are given in Table 2.

Table 2 depicts stationarity at level and at first difference with the use of automatic lag selection. Similar results are obtained from the ADF and PP estimates. Trading volume, AMIHUD and stock returns are stationary at level, while money supply,

inflation, interest rate, exchange rate and COVID-19 become stationary after first differencing. Therefore, the study rejects the null hypothesis which states the presence of unit root in each variable.

Table 2: Result of unit root (stationarity test).

Variable	ADF		Phillip Perron test			
	Test statistic	5% Critical level	Test statistic	5% Critical level	Order of Integration (ADF)	Order of Integration (PP)
Trading Volume	-10.491	-3.452	-10.490	-3.452	I(0)	I(0)
AMIHUD_ILLIQ_RATIO	-10.820	-3.452	-10.823	-3.452	I(0)	I(0)
STOCK_RETURNS	-9.191	-3.452	-9.191	-3.452	I(0)	I(0)
MONEY_SUPPLY	-10.565	-3.452	-10.653	-3.453	I(1)	I(1)
INFLATION	-3.999	-3.454	-5.023	-3.453	I(1)	I(1)
INT_RATE	-10.261	-3.452	-10.261	-3.453	I(1)	I(1)
EXCHANGE_RATE	-8.811	3.452	-8.712	3.453	I(1)	I(1)
COVID-19	-10.359	3.452	-10.362	3.453	I(1)	I(1)

Source: Author's computation (2022)

The unit root test confirms that the variables are a mix of I(0) and I(1) series. Consequently, the long-run relationship can be ideally estimated using the ARDL bounds test. Maximum lag length of four is imposed to achieve this. Equation 3 is estimated using the Akaike information criterion, and the decision rule is to reject the null hypothesis if the F-statistic estimate is higher than the upper bound critical value at 5% level of significance. On the other hand, the null hypothesis will be accepted if the F-statistic falls below the lower bound critical value at 5% level of significance. If the F-statistic falls within upper and lower levels, the test will be indecisive.

Table 3 shows the F-statistic and critical values. The F-statistic (16.590) is higher than the upper bound critical value (3.61) at 5% level. Thus, the null hypothesis which states that no cointegration exists between the predictors and stock market liquidity (measured as trading volume) is rejected. This suggests the presence of a long-run relationship between stock market liquidity and the predictor variables (*LIQ_1; SR; MS; INF; INT; EXC; CVD*).

Table 3: Result of bounds test for cointegration (trading volume as measure of liquidity).

Model selection criteria		Bound CV (10%)		Bound CV (5%)		Bound CV (1%)	
	Estimated models						
	F-statistic	1(0)	1(1)	1(0)	1(1)	1(0)	1(1)
	Dependent Variable = LIQ (trading volume)	2.12	3.23	2.45	3.61	3.15	4.43
AIC	F_{LIQ} (LIQ_1, SR, MS, INF, INT, EXC, CVD) = 16.590***						

*Note: *** indicates significance at 1% level. LIQ = stock market liquidity; SR = stock returns; MS = money supply; INF= inflation; INT = interest rate; EXC = exchange rate; CVD = COVID-19*

Based on the evidence of a long-run relationship obtained above, the study proceeds to estimating the ARDL model. However, the need arises to conduct diagnostic tests before estimating the long-run relationship. This will prevent the reporting of unreliable results. Therefore, the Breusch-Pagan Godfrey test of heteroscedasticity and the Breusch-Godfrey serial correlation LM test are conducted. These tests are carried out to check for the possible existence of serial correlation and heteroscedasticity, respectively.

Table 4: Results of diagnostic test.

Test	**F-Statistic**	**P-Value**
Breusch-Pagan-Godfrey Heteroscedasticity Test	1.461	0.190
Breusch-Godfrey Serial Correlation LM Test	0.541	0.584

Table 4 shows insignificant results for the F-statistics of both the heteroscedasticity and serial correlation tests. Therefore, the null hypotheses which state the absence of heteroscedasticity and the absence of serial correlation are accepted. Thus, the model is free of both issues.

Table 5: Estimated results of long-and short-run relationships (trading volume)

Dependent Variable = LIQ=Trading Volume

Variables	AIC
Long-Run Estimates	
SR	0.217 (0.095)**
MS	0.286 (0.107)***
INF	-0.003 (0.001)**
INT	-4.861 (17.770)
EXC	-5.510 (3.213)*
CVD	-0.891 (5.429)
C	28.506 (57.070)
R^2	0.540
F-statistics	16.590***
Short-Run Estimates	
ΔTV_1	1.077 (0.100)***
ΔSR	0.012 (0.001)***
ΔMS	0.545 (0.151)***
ΔINF	-0.004 (0.001)***
ΔINT	-7.229 (4.714)
ΔEXC	-8.887 (62.682)
ΔCVD	-0.160 (0.050)***
CointEq(-1)	-1.066 (0.100)***

*Note: Figures in parentheses are the standard errors. *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively. TV = trading volume; SR = stock returns; MS = money supply; INF = inflation; INT = interest rate; EXC = exchange rate; CVD = COVID-19.*

Based on the joint cointegration affirmed between the predictors and stock market liquidity (trading volume), the long- and short-run relationships are reported in Table 5. Similar results are obtained for both the short-run and long-run estimates. Findings show evidence of liquidity persistence as the current level of liquidity is positively influenced by the past liquidity levels. However, this evidence is only confirmed in the short run as the long-run estimates cannot be obtained. Estimates in Table 5 reveal that market performance (measured by stock returns) and money supply have positive effects on stock market liquidity both in the short run and the long run. Findings on stock returns show that stock market liquidity is enhanced with improved performance of the market. This finding corroborates earlier findings by Chordia et al. (2005), Goyenko and Ukhov (2009) and Miralles-Marcelo et al. (2015). Findings on money supply also indicate that credit constraints are loosened when money supply increases. This will boost trading activities and consequently enhance stock market liquidity. This finding is consistent with prior results by Fernandez-Amador et al. (2011) and Miralles-Marcelo et al. (2015). However, it contradicts the finding by Siddiqi et al. (2021), where money supply is found to be insignificant in explaining liquidity.

Findings reveal that inflation negatively affects stock market liquidity both in the short run and the long run. This also implies that liquidity rises (falls) when inflation level declines (increases). This finding matches the earlier finding by Jepkemei (2017). Table 5 also shows that the COVID-19 pandemic adversely affects stock market liquidity in the short run. This is as expected because data points matching the period of COVID-19 are relatively few compared to the entire data points. This finding is consistent with the notion that stock market liquidity is time-dependent. The study finds that interest rate has no effect on market liquidity either in the short run or the long run. Exchange rate is also found to be insignificant in the short run. It however becomes slightly significant in the long run at 10% level of significance. The R-squared and F-statistic estimates indicate that the model is of good fit and capable of making predictions.

4.2 Robustness check

The study proceeds to check whether the main results obtained are robust to the alternate definition of stock market liquidity. In order to achieve this, the study employs the AMIHUD illiquidity ratio as a measure of stock market liquidity in Table 6. Since this is an illiquidity measure, then reverse results are expected in order to maintain the earlier inferences in Table 5.

Table 6: Estimated results of long-and short-run relationships (AMIHUD).

Dependent Variable = LIQ=Amihud Illiquidity Ratio

Variables	AIC
Long-Run Estimates	
SR	-2.511 (0.269)***
MS	-0.590 (0.101)***
INF	0.269 (0.110)**
INT	5.032 (3.367)

EXC	2.242 (1.261)*
CVD	0.619 (0.659)
C	-10.359 (3.453)
R^2	0.754
F-statistics	97.220***
Short-Run Estimates	
ΔAMIHUD_1	0.263 (0.386)
ΔSR	-1.245 (0.170)***
ΔMS	-0.575 (0.100)***
ΔINF	0.012 (0.001)***
ΔINT	4.919 (4.552)
ΔEXC	0.162 (3.280)
ΔCVD	0.037 (0.126)
CointEq(-1)	-1.841 (0.213)***

*Note: Figures in parentheses are the standard errors. *, ** and *** indicate significance at 10%, 5% and 1% levels, respectively. TV = trading volume; SR = stock returns; MS = money supply; INF = inflation; INT = interest rate; EXC = exchange rate; CVD = COVID-19.*

The estimates in Table 6 show that the results obtained for stock returns, money supply and inflation are robust to the alternate measure of liquidity. Findings reveal that the higher the stock returns and money supply, the lower the stock market illiquidity. On the other hand, the higher the inflation, the higher the stock market illiquidity. Thus, the results obtained for the three variables (stock returns, money supply and inflation) are robust to the alternate specification of the dependent variable and therefore consistent with the findings in Table 4. However, the results obtained on lag of liquidity (AMIHUD_1) and COVID-19 are not in line with the initial results. Although these two variables are found significant in the short run when trading volume is used as a measure of liquidity, they are not significant with the use of the AMIHUD illiquidity ratio. Thus, there is no evidence to show persistence in illiquidity of the stock market.

Overall, the estimates show that the predictors are stronger in explaining stock market liquidity in the short run than in the long run.

5. CONCLUSION

The study examines the predictors of stock market liquidity in the Nigerian market. Monthly series data covering the period January 2013-December 2021 is analysed using the ARDL bounds testing approach. Findings reveal that stock returns, money supply and inflation are important predictors of liquidity in the Nigerian stock market. The study also obtains evidence of liquidity persistence in the market. However, this persistence is limited to the short run. Based on the findings, the study concludes that stock market liquidity is enhanced with improved market performance and monetary interventions by the government. The study concludes further that while persistence of liquidity features in the market, high price levels impede stock market liquidity.

This study gives a number of policy implications. The predictors of stock market liquidity revealed should be considered by investors and policy holders in their liquidity forecast. Having a good knowledge of the predictors will assist policymakers to closely monitor factors that can increase liquidity risks. Consequently, policy measures are

adopted to manage those factors especially during market downturns. This will reduce exposure of the market to liquidity decline and consequently improve market liquidity. When liquidity risks are mitigated, investors' confidence in the market is enhanced. More so, understanding the predictors will also help investors monitor their liquidity exposures better and guide rational investment decision making. Future researches can examine liquidity in the bond market, and such studies can compare predictors of market liquidity among few African countries.

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