STOCK MARKET LIQUIDITY AND FIRM PERFORMANCE IN THE NIGERIAN STOCK EXCHANGE

Tarila Boloupremo

University of Africa, Bayelsa State

Abstract

The paper extends the investigation on the relationship between liquidity and stock returns by examining the influence of market liquidity on stock returns in the Nigerian Stock exchange. Vector auto-regression model was employed in examining the impact of liquidity measures such as the volume of trading and turnover on stock returns for the period 1985-2015. Empirical results suggest that the higher the market liquidity (volume of trading and turnover), the higher the stock index returns. Thus, establishing a positive relationship between liquidity and stock returns of firms listed on the Nigerian stock market during the period examined after controlling for market size. This result is not in line with the negative relationship between liquidity and market return as obtained by studies on developed markets.

Keywords: Liquidity, Stock Returns, Turnover, Trade Volume

Jel codes: B26, C01, D53, EO2, E44

1. Introduction

Fundamental factors such as transaction costs, marketability and Liquidity, are significant factors in determining investors' portfolio investment choice in developed markets. Stock returns are affected by liquidity which is recognized to fluctuate based on time (Avramov & Chordia 2006; Chordia, Roll, & Subrahmanyam; Chordia, Roll & Subrahmanyam 2008; Pástor & Stambaugh 2003). Potential unproductive private sector information, institutional bottlenecks and capital restrictions effects are foreseen in emerging and developing markets (Bekaert & Harvey 1997; Easley, Hvidkjaer & O'Hara 2010; Hearn 2011). The dynamics of stock liquidity and how it can influence the return of stocks have elicited a new level of interest in modern finance research. The risk factor in asset pricing model includes illiquidity.

The trading of a security to prevent loss or to make profit in a timely manner is often referred to as stock liquidity. Illiquidity has not been considered as a significant factor in conventional asset pricing models based on the assumption that fundamental factors can be used to explain the returns on stock. There is a difference between ask and bid prices in the market in live trading. This happens whenever investors decide to short (long) their stocks, ask (offer) price requires a selling concession (buying premium). Thus, the bid-ask price spread usually reflects the marketability (liquidity) of a stock (Amihud, Mendelson, and Pedersen, 2005).

The inability of investors to transfer ownership right of an investment or security can be termed a liquidity risk borne by the investor. This is one of the important features employed by firms in the financial services sector. (Demsetz 1968; Amihud & Mendelson 1980; Ho & Stoll 1981, 1983). The value of stocks can be influenced in the negative direction when there is lack of liquidity in the stock market. Size, book-to-market value, and other independent variables employed as control in further researches suggest that liquidity is consistently significant in influencing returns. Empirical studies from the works of (Brennan & Subrahmanyam 1996; Chordia, Subrahmanyam & Anshuman 2001) indicate that liquidity premium is very significant in their findings. The similarity in these studies is that their analyses was centered on market liquidity in developed markets. These markets are highly liquid and quote driven when compared to markets in developing economies.

There has been a significant decrease in asset liquidity of financial corporations arising from the global financial upheaval in 2007 especially mortgage-based securities accompanied by a decline in their stock liquidity as well (Boehmer, Jones, and Zhang (2009), both emerging and developed markets inclusive. There is a dearth of empirical

works of literature that have examined the relationship that exists between stock liquidity and returns in developing markets such as Nigeria (Hearn, 2014). The objective of this paper, therefore, is to bridge this gap and add to financial studies, which had examined the liquidity; market size and stock return relationship in developing markets. The Nigerian Stock Exchange was founded in 1960 as the Lagos Stock Exchange. In December 1977, it became known as the Nigerian Stock Exchange (NSE) with branches established in some of the major cities of the country. As of June 28, 2016, it has about 180 listed companies with a total market capitalization of over thirty billion United States dollars. The exchange offers a range of financial services from trading and listing, ancillary technology, licensing services, provision of market data services among others. The objective of the study is to analyze the effect of liquidity on the return of companies quoted in the stock market in Nigeria. The remainder of this paper is arranged in the following format. Section 2 reviews the literature. Section 3 includes the methodology for the study. The result and analyses are presented in section 4, and section 5 concludes the research.

2. Literature Review

One of the earliest documented theories on the liquidity and return relationship studies was by (Amihud and Mendelson, 1986). In their study of the liquidity and return nexus, they employed GLS and Ordinary Least Square regression on quoted bid-ask spread (which represent the liquidity variable) to determine the return of stocks on the New York stock exchange spanning a period of 1961-1980. Their findings corroborate the "liquidity premium" theory. They indicated that the amortized transaction cost per unit of time diminishes when an asset is held for a long period. At equilibrium assets that are less liquid tend to be held less by investors who desire an investment prospect with a longer duration. As a consequence of this horizon clientele, they suggested that forecasted asset return can be an increasing and concave function of the relative spread. Similar study on liquidity and stock return by Brennan and Subrahmanyam (1996) indicated that securities which are comparatively not liquid yield a higher rate of return.

Using liquidity variables such as lower bid-ask spreads, lower price impact of trade and higher turnover, Baker and Stein (2004) constructed a model to describe how increases in liquidity can be employed to predict lower future returns for aggregate and firm level data. Employing the model, they proved in their study with the following conclusions that (i) share turnover and aggregate measures of equity issuance are highly related and (ii) share turnover and aggregate measures of equity issuance analyzed using multiple regression both have incremental predictive power for future equal-weighted market returns.

(Acharya and Pedersen, 2005) employing a liquidity-adjusted capital asset pricing model incorporating liquidity risk in their study suggested that the expected return on a stock is a function of its expected liquidity and covariance's with its own return, liquidity with the market return. Their findings showed further that when there is a persistent shock on the liquidity of a stock it would result to high-predicted future returns and reduction in its current returns. Employing a CAPM based model Jacoby, Fowler, and Gottesman (2000) in their study, which examined the real measure of systematic risk when liquidity cost is incorporated they concluded that it is a function of the net (after bid-ask spread) returns. They further concluded that a convex and positive correlation exists between future spread cost and expected return when analyzed using the CAPM. In emphasizing the relevance of liquidity as a factor in stock return Domowitz, Hansch, and Wang (2005) Using Australian market data in their study indicated the significance of liquidity and liquidity commonalities and their incorporation in asset pricing models.

In their research (Jones,2002; Amihud, 2002 and Pastor & Stambaugh, 2003) which examined the liquidity and stock return nexus using times series for bid-as spreads for different markets concluded that a negative relationship exists between a change in illiquidity and realized excess returns. Other developed markets studies carried out by (Brennan and Subrahmanyam 1996; Chordia, Subrahmanyam and Anshuman 2001) on the liquidity and stock return relationship indicates that liquidity still remains a significant factor as well as evidence of the liquidity premium. The conclusions in these studies was arrived at after controlling for size, book-to-market, and other variables. However, all these studies on market liquidity examined were carried out in develop markets. These markets are the most liquid and quote driven internationally. The findings from liquidity and stock return studies for emerging markets, are not similar to those carried out in developed markets Harvey (1995, 2000). The Studies analyzing the nexuss between liquidity and stock returns have produced empirical results, which suggest: no relation, positive and negative relation (Rouwenhorst 1999; Bekaert, Harvey and Lundblad 2007).

Empirical studies investigating return and liquidity have employed various kinds of liquidity measures, to examine the link that exists between liquidity and excess stock returns. In one of these studies, Brennan & Subrahmanyam (1996) employed transaction costs as a variable to represent liquidity while trading volume and turnover rate were used to represent the liquidity variable in liquidity and return studies by (Datar, Naik, and Radcliffe, 1998; Hartian and Sitorus, 2015). In other studies, on emerging markets. The findings from these studies suggest a significant influence of liquidity in their investigation of stock return despite employing different liquidity measures, particularly for cross-sectional studies.

In Nigeria, several studies are devoted to finding risks that impact stock returns, but illiquidity as a risk factor has not been widely employed as a measure. In one of such studies on the determinants of stock return, (Osamwonyi and Evbayiro-Osagie, 2012) examined the relationship between macroeconomic variables and the Nigerian stock market index, they observed that macroeconomic variables such as exchange rates, GDP, and fiscal deficits are positively related to stock market index, while money supply is negatively related to the stock market index.

The main motivation for this study is to contribute, to existing studies by empirically investing the liquidity and return relationship for securities listed in one of Africa's leading stock market, the Nigerian stock exchange (NSE).

3. Data and Methodology

In this study the dataset employed are annual times series from the period January 1985 to December 2015 and are all market-based for the firms under study. It contains trading volume, share turnover, NSE all-share index (ASI) and non-liquidity control variable which is market capitalization of each firm to denote firm size.

3.1. Stock Return

The study adopted the NSE all-share index (ASI) as a proxy (endogenous variable) for firm performance and market return of shares listed in the NSE as in Osamwonyi et al (2012) and Batten and Xuan (2014). The market index is a spot measure, which reflects the overall direction of the market and the scope of its movements. It shows the changing average value of the share prices of all equities on the stock exchange. The market index has been employed extensively as a measure to depict how well a market is performing.

3.2. Stock Liquidity Measures

In examining the link between excess stock returns and liquidity risk there has not been a generally accepted measure because of the ambiguity in its definition as noted by Kyle (1985) thus, "liquidity is a slippery and elusive concept, in part because it encompasses a number of transactional properties of markets which include tightness, depth, and resiliency." Some studies employed bid-ask spread and trading cost as liquidity measures (Amihud & Mendelson, 1986; Brennan & Subrahmanyam, 1996) but in practice, data on bid-ask spreads and trading costs are difficult to obtain and are not reliable in international markets.

In Nigerian Stock Exchange (NSE), an order system rather than bid-ask spread is in use hence the bid-ask spread is not important. As a result of this challenge in data limitation, trading volume and turnover have been employed as liquidity measures following the studies of Berkman & Eleswarapu (1998), Rouwenhorst (1999), Chordia, Roll & Subrahmanyam (2001), Chordia, Subrahmanyam & Anshuman (2001), Hasbrouck and Seppi (2001), Lesmond (2005), Levine & Schmukler (2006), Nguyen, et.al (2007), Lam & Tam (2011) and Batten and Vo (2014). Following these works, the study employed trading volume and turnover as measures of liquidity.

3.3. Market Size

The study employed market capitalization as a control variable to measure size of the Nigerian capital market. Some studies which incorporated this measure in their studies include Banz (1981), Fama & French (1992), Berk (1995) and Loukil, Zayani & Omri (2010).

3.4. Preliminary Tests

To avoid spurious regressions in the time series data employed and in analyzing empirically stock market liquidity and firm performance it is mandatory to carry out stationarity and co-integration tests. Unit root testing of all the variables employed in the model is crucial in VAR analysis. The Augmented Dickey-Fuller (ADF) Unit Root Test is employed. The number of co-integrating vectors in the system needs to be identified before the VAR analysis can be carried out as well. The paper employed the Johansen Co-Integration Test.

3.5. Vector Auto - Regression Model
The research employed vector auto-regression modeling in the analysis of the impact of stock market liquidity on the performance of firms listed in the Nigerian Stock market. The study estimates the VAR model using:

$ASI_t : x_{1,t} = c_1 + \square 11,1x_{1,t-1} + \square 12,1x_{2t-1} + \square 13,1x_{3t-1} + \square 1t$ …………………………1
$TV_t : x_{2,t} = c_2 + \square 14,1x_{1,t-1} + \square 15,1x_{2t-1} + \square 16,1x_{3t-1}, + \square 2t$ ………………………..2
$TN_t : x_{3,t} = c_3 + \square 17,1x_{1,t-1} + \square 18,1x_{2t-1} + \square 19,1x_{3t-1}, + \square 3t$ ………………………..3
$MKTCAP_t : x_{4,t} = c_3 + \square 20,1x_{1,t-1} + \square 21,1x_{2t-1} + \square 22,1x_{3t-1}, + \square 4t$ ………………....4

Where:
ASI_t is the proxy for firm performance and market return and is regressed upon its own lagged variables
TV_t is the trading volume and is regressed upon its own lagged variables
TN_t is turnover and is regressed upon its own lagged variables
$MKTCAP_t$ is market capitalization and is regressed upon its own lagged variables
$\square p$ (i = 0,1,2,3…p) denotes the (k $\square$ k) –parameter matrices with $\square p = 0$
c are constants which maybe zeros
εt is a white noise

The study employed the ordinary least square method (OLS) to evaluate the regression models. The t-statistic is calculated for each coefficient to evaluate its significance and each equation is regarded as a regression equation. Following the works of Reinsel (1993), the ordinary least squares and the maximum likelihood methods are asymptotic and one can be used in place of the other in some regularity situations, the estimates are asymptotically normal. for some regularity situation. The parameters for the stated VAR model can be estimated employing either the ordinary least squares or the maximum likelihood methods.

4. Results and Discussion
Results of the preliminary tests, Descriptive statistics, Augmented Dickey-Fuller (ADF) Test and Johansen Co-integration test are depicted in table 1, 2, and 3 respectively. VAR estimation procedure and Impulse Response for Equation 1 are depicted in table 5 and figure 1. Summary of the results is discussed in the succeeding sections.

Table 1: Descriptive statistics

	LogASI	LogTV	LogTN	LogMKT CAP
Mean	8.58	11.69	10.31	5.91
Variance	3.6	12.57	12.05	8.
Standard Deviation	1.9	3.55	3.47	2.83
Minimum	4.85	0.	3.33	0.99
Maximum	10.97	15.08	14.67	9.49
Median	9.	12.45	10.98	6.14
Mean Deviation	1.58	2.32	2.96	2.39
Sum	265.85	362.49	288.79	183.23
Skewness	-0.69	-2.27	-0.5	-0.34
Kurtosis	2.12	8.3	1.95	1.77
Obervations	31	31	28	31

Table 1 indicates the descriptive statistics of all the variables employed in this study over the period 1985 through 2015. Return (all-share index) has a mean 8.58. The standard deviation of the return is 1.9, which means the data of return can be 1.9 higher or lower. The minimum value of the return for the Nigerian market for the 31-year is 4.85

and the maximum value is 10.97, the gap between the return value shows that the return variable has a high variation. Next variable is trading volume, which is extracted from the log of the annual trading value. The mean of trading volume is 11.69 with the standard deviation 3.55. The minimum value of trading volume was estimated at 0, while the maximum value stood at 15.08. Descriptive statistics of the market turnover ratio is estimated as follows: mean of this variable is 10.31 with the standard deviation of 3.55. The maximum value of the market turnover is 14.65 and the minimum value is 3.33. The mean value for market size variable is measured as 5.91 and the standard deviation is 2.83. The minimum and maximum values stood at 0.99 and 0.49 respectively.

Table 2: Augmented Dickey-Fuller Test

Variables	ADF Test Statistic Value	5% Mackinon Critical Value	Remark	Order of Integration
LogASI	-3.831461	-2.967767	Stationary	I(1)
LogTV	-4.125731	-2.963972	Stationary	I(0)
LogTN	-8.32167	-2.981038	Stationary	I(1)
LogMKT CAP	-4.315935	-2.967767	Stationary	I(1)

From Table 2, the variables of interest were stationary at first difference i.e. I(1) series excluding LogTV which was stationary at level i.e. I(0) as its ADF statistic value is greater than the Mackinnon Critical Value @ 5% at absolute term before differencing.

Table 3: Result of Johansen Co-Integration Test

Maximum Eigen Value	Trace Statistics	5% Critical Value	10% Critical Value	Hypothesised No.
0.868849	45.69487	54.68150	44.49359	r = 0*
0.632999	29.79707	25.01689	10.07624	r ≤ 1**
0.539697	4.62611	15.49471	2.705545	r ≤ 2*
0.288122	14.2646	5.450132	6.634897	r ≤ 3**

*reject hypothesis at 10% significance level and **reject hypothesis at both 5% and 10% significance levels. The trace statistics, specifies two co-integrating equations at 10% and two co-integration equations at both 5% and 10% significance level, this suggest there exist a long run relationship among the variables of interest. The null hypothesis of no co – integration is therefore rejected.

The next level is the VAR estimation:

VAR estimation

Results of the VAR estimation model is presented in table 3 and appendix 1 and summarized below.

Table 4: Summary of Vector auto-regression estimates

	LogASI	LogTV	LogTN	LogMKT CAP
LogASIt-1	2.107715	1.362021	1.759131	0.665010
LogASIt-2	-1.111172	-1.045441	-1.126063	-0.499494
LogTVt-1	-0.302886	-0.2977	-0.292615	0.371501
LogTVt-2	0.304296	0.384046	0.277479	0.321662
LogTNt-1	0.153058	0.082064	0.576564	0.339784
LogTNt-2	0.111796	0.108788	0.181357	0.215068
LogMKTCAPt-1	-0.96616	-0.09818	-0.361562	-0.281682
LogMKTCAPt-2	0.540737	0.536096	0.281923	-0.410278
C	0.237475	-1.953179	-2.146094	1.168467
R-squared	0.965362	0.985221	0.989522	0.953603
Adj. R-squared	0.949062	0.978267	0.984592	0.931769
F-statistic	59.22390	141.6642	200.6890	43.67514

Results indicate that the shock affecting lagged LogASIt -1 for market returns has a positive impact on the stock market. This means that the change in stock returns for any previous year will lead to an increase in the current year in the stock returns. However, shocks affecting stock returns for the lagged variable LogASIt -2 have a negative impact on the current year stock returns. This implies that an increase in stock returns in any previous two years will lead to a decrease in stock returns in the current year vice versa for the period 1985 to 2015 in the study.

Results indicate that the shock affecting the total volume of stocks traded in the market two years ago have a negative impact on the current stock returns for the Nigerian market. This implies that the change in trade volume from the previous year would influence the current stock returns inversely. However, shock affecting total volume of stocks traded in the market a year ago has a positive impact on current stock returns in the market. Thus, a decrease in trading volume a year ago will lead to a decrease in current stock market returns.

However, the shock affecting market turnover two years ago have a positive impact on the current year stock returns in the market. This indicates that change in market turnover two years ago due to a shock would influence current market returns either positively or negatively, in the same direction.

The shock affecting market capitalization a year ago has a negative impact on the stock market return for the current year. This means that change in market capitalization a year ago due to a shock would have an inverse effect on the current market return for the current year. Thus, an increase in market capitalization a year ago due to a shock would mean a decrease in stock return for the current year.

Results further indicate that the shock affecting market capitalization a year ago has positive impact on stock market returns, which means that increase market capitalization a year ago would also appreciate stock returns for the current quarter.

Impulse Response

The VAR models were analyzed using the impulse response analyses to enhance robustness. The impact of exogenous effect over the whole process over time is presented in figure 1 below.
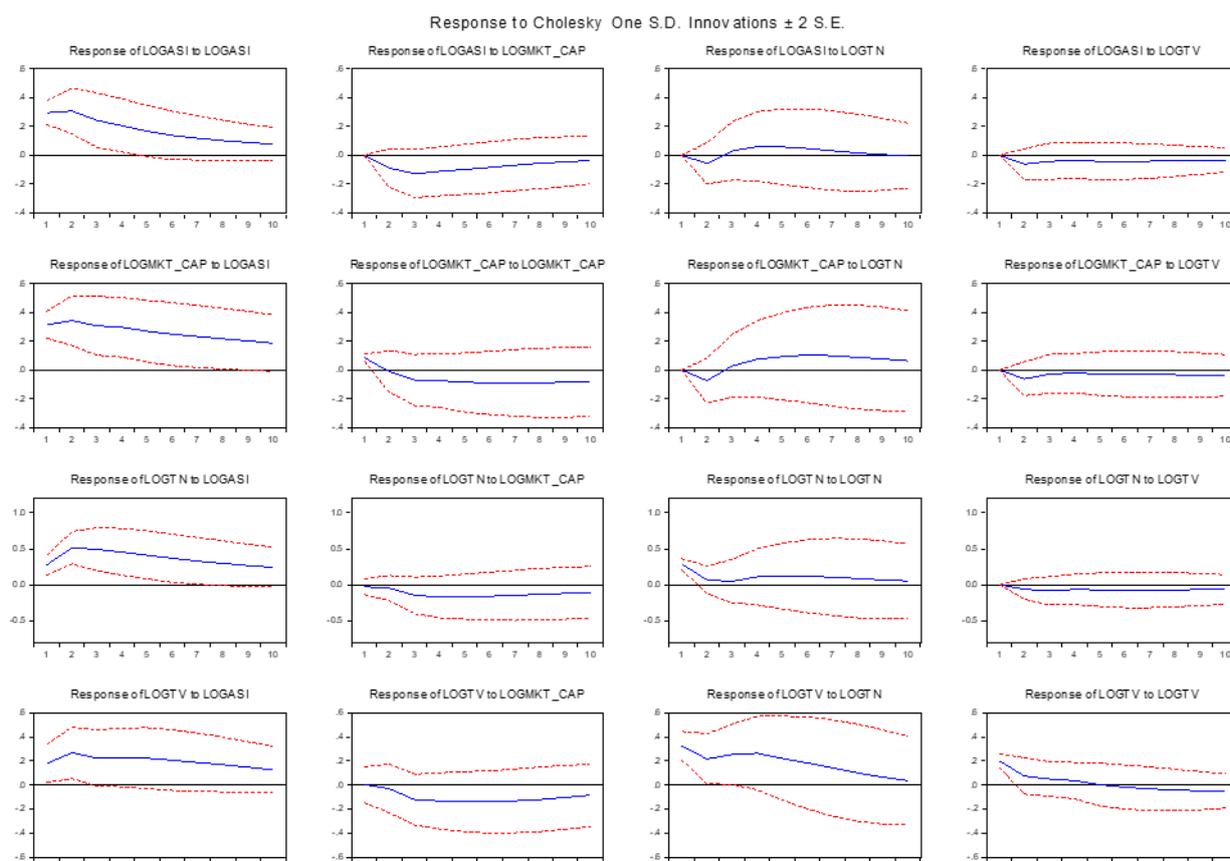

Figure 1: Impulse Responses for one lag VAR of ASI, TV, TN , MKTCAPt

Fig. 1. Impulse Response Function (IRF) for one lag of ASIt TVt TNt MKTCAPt

Fig. 1 shows the impulse response functions (IRF). In Fig. 1 the plot in the first row depicts the response of the stock market performance variable (ASI) to a shock in market capitalization (MKTCAPt), trading volume (TV) and market turnover (TV) respectively, measured in standard deviations terms. It is clear from the first row that the response of the stock market performance variable (ASI) to liquidity market liquidity is positive.

5. Conclusion

For governments in developing economies, in particular, the significance of liquidity as a factor in stock returns is an interesting and central topic in finance and economics research because of its very serious policy implications. This paper studied the nexus that exists between stock market liquidity and performance of firms in the Nigerian Stock Exchange, a developing market in West Africa. The study employed two proxies of liquidity: (1) trading volume and (2) market turnover while market capitalization was used as a controlled variable and proxy for market size. Outputs from the results analyzed indicate that stock return and liquidity variables are positively related. The studies of

(Kaniel and Mingelgrin, 2001; Jun, Marathe and Shawky, 2003; Jonathan and Xuan 2014 and Hartian, and Sitorus, 2015) which suggest that stock return for developing economies are positively related with market liquidity variables is corroborated by this study. There is a minimal degree of liquidity to become a risk factor when the coalescence between emerging and the developed market is not high. The positive nexus between the liquidity measures used in the study and stock returns might be due to this factor. There are several kinds of literature, which suggests diversification benefits when emerging frontier markets such as Nigeria are fused with international portfolio and the global economy. Finding from this paper adds to those studies.

References

Amihud, Y., and Mendelson, H. (1980a). Dealership market: market making with inventory. Journal of Financial Economics, 8(1), 311–53.

Amihud, Y., and Mendelson, H. (1986b). Asset pricing and the bid-ask spread. Journal of Financial Economics, 17, 223–249.

Amihud, Y. (2002). Illiquidity and stock returns: Cross-section and time-series effects. Journal of Financial Markets, 5, 31–56.

Amihud, Y., Mendelson, H., and Pedersen, L.H. (2005). Liquidity and asset price. Hanover, MA: Now Publishing.

Acharya, V.V., and Pedersen, L.H. (2005). Asset pricing with liquidity risk. Journal of Financial Economics, 77, 375–410.

Avramov, D., and Chordia, T. (2006). Predicting Stock Returns. Journal of Financial Economics, 82(2), 387–415.

Banz, R.W. (1981). The relationship between return and market value of common stocks. Journal of Financial Economics, 9(1), 3–18.

Basu, S. (1983). The relationship between earnings' yield, market value and return for NYSE common stocks: further evidence. Journal of Financial Economics, 12(1), 129–56.

Berk, J. (1995). A critique of size-related anomalies. Review of Financial Studies. 8(2), 275–86.

Brennan, M.J., and A. Subrahmanyam. (1996). Market microstructure and asset pricing: on the compensation for illiquidity in stock returns. Journal of Financial Economics, 41(3), 441–64.

Bekaert, G. and Harvey, C.R. (1997). Emerging Equity Market Volatility. Journal of Financial Economics, 43(1), 29–77.

Brennan, M.J., Chordia, T., and Subrahmanyam, A. (1998). Alternative factor specifications, security characteristics, and the cross-section of expected stock returns. Journal of Financial Economics, 49(3), 345–373.

Baker, M. and Stein, J.C. (2004). Market liquidity as a sentiment indicator. Journal of Financial Markets, 7(3), 271-299.

Batten, J.A. and Xuan Vinh Vo, X, V. (2014). Liquidity and Return Relationships in anEmerging Market, Emerging Markets Finance, and Trade, 50(1), 5-21.

Chan, L.K., Y. Hamao, and Lakonishok, J. (1991). Fundamentals and stock returns in Japan. Journal of Finance, 46(5), 1731–89.

Chordia, T., and Swaminathan, B. (2000). Trading volume and cross-autocorrelations in stock returns. Journal of Finance, 55, 913-935.

Chordia, T, Roll, R, and Subrahmanyam, A, (2001). Market liquidity and trading activity. The Journal of Finance, 56 (2), 501-530

Chordia, T, Subrahmanyam, A., and Anshuman, V.R, (2001). Trading activity and expected stock returns. Journal of Financial Economics, 59 (1), 3-32

Chordia, T.; R. Roll; and Subrahmanyam, A. (2008). Liquidity and Market Efficiency. Journal of Financial Economics, 87(2), 249–268.

Demsetz, H. (1968). The cost of transacting. Quarterly Journal of Economics 82(1), 33–53.

De Bondt, W.F.M., and Thaler, R.H. (1985). Does the stock market overreact? Journal of Finance, 40(3), 793–808.

Datar, V.T., N.Y. Naik, and R. Radcliffe. (1998). Liquidity and stock return: an alternative test. Journal of Financial Markets, 1(2), 203–19.

Domowitz, I., Hansch, O., and Wang, X. (2005). Liquidity commonality and return co movement. Journal of Financial Markets, 8, 351–376.

Easley, D.; Hvidkjaer, S. and O'Hara, M. (2002). Is Information Risk a Determinant of Asset Returns? Journal of Finance 57(5), 2185–2221.

Fama, E., and K. French. (1992). The cross-section of expected stock returns. Journal of Finance, 47(2), 427–65.

Fama, E., and French, K. (1993). Common risk factors in the returns on stocks and bonds. Journal of Financial Economics 33, no. 1: 3–56.

Gervais, S., Kaniel, R., and Mingelgrin, D. H. (2001). The high-volume return premium. The Journal of Finance, 56(3), 877-919.

Ho, T., and H. Stoll. (1981). Optimal dealer pricing under transactions and return uncertainty. Journal of Financial Economics, 9(1), 47–73.

Ho, T., and H. Stoll. (1983). The dynamics of dealer markets under competition. Journal of Finance, 38(4), 1053–74.

Harvey, C. (1995). Predictable risk and returns in emerging markets. Review of Financial Studies, 8(3),19–50.

Harvey, C. (2000). Drivers of expected returns in international markets. Emerging Markets Quarterly, (Fall): 1–17

Hasbrouck, J, and Seppi, D, (2001). Common Factors in Prices, Order Flows and Liquidity. Journal of Financial Economics, 59, 383-411.

Hearn, B. (2014). Size and Liquidity Effects in Nigeria: An Industrial Sector Study. The Journal of Developing Areas, 48(3), 1-30

Hartian, K. R. and Sitorus, R.E. (2015). Liquidity and Returns: Evidence froStock Indexes Around the World. Asian Economic and Financial Review, 5(1), 33-45

Jegadeesh, N., and S. Titman. (1993). Returns to buying winners and selling losers: implications for stock market efficiency. Journal of Finance, 48(1), 65–91.

Jacoby, G., Fowler, D.J., and Gottesman, A.A. (2000). The capital asset pricing model and the liquidity effect: A theoretical approach. Journal of Financial Markets, 3, 69–81.

Jones, C.M. (2002). A century of stock market liquidity and trading costs (SSRN).

Jun, S.G., A. Marathe and H.A. Shawky, (2003). Liquidity and stock returns in emerging equity markets. Emerging Markets Review, 4(1), 1-24.

Jonathan A. Batten and Xuan Vinh Vo (2014) Liquidity and Return Relationships in an Emerging Market. Emerging Markets Finance and Trade, 50(1), 5-21

Kyle, A.S. (1985). Continuous auctions and insider trading. Econometrica, 53, 1315– 1335.

Lesmond, D., (2005). Liquidity-augmented capital asset pricing model. Journal of Financial Economics, 77, 411–452.

Loukil, N., Zayani, M.B. and Omri, A. (2010). Impact of liquidity on stockreturns: an empirical investigation of the Tunisian stock market. Macroeconomics and Finance in Emerging Market Economies, 3(2), 261 283,

Lam, K.S., and Tam, L.H., (2011). Liquidity and asset pricing: Evidence from the Hong Kong stock market. Journal of Banking and Finance, 35 (9), 2217–2230.

Nguyen, D., Mishra, S., Prakash, A., and Ghosh, D.K., (2007). Liquidity and asset pricing under the three-moment CAPM paradigm. The Journal of Financial Research, 30, 379–398.

Osamwonyi, I.O., and Evbayiro-Osagie, E. I. (2012). The Relationship between Macroeconomic Variables and Stock Market Index in Nigeria, Journal of Economics, 3(1): 55-63.

Pastor, L., and Stambaugh, R.F. (2003). Liquidity risk and expected stock returns. Journal of Political Economy, 111, 642–685.

Rosenberg, B., K. Reid, and Lanstein, R. (1985). Persuasive evidence of market inefficiency. Journal of Portfolio Management, 11(3), 9–17.

Reinsel G.C. (1993). Elements of multivariate time series analysis. Springer Verlag.

Rouwenhorst, K.G. (1999). Local returns factors and turnover in emerging markets. Journal of Finance, 54(4), 1439–64.