Impact of financial liberalization on stock market volatility in Nigeria

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Keywords
Financial liberalization, stock market, volatility, investors, capital accumulation.

Abstract

This study attempted to investigate the impact of financial liberalization on stock market volatility in Nigeria. This purpose was achieved by hypothesizing that financial liberalization has a significant impact on stock market volatility in Nigeria. This was supported by a review of theoretical and empirical literature on the subject-matter. A longitudinal survey design which covers the period of 1981 – 2012 was employed in generating data on financial liberalization and stock market volatility from the central Bank of Nigeria Statistical Bulletin. The data generated were analysed using the regressing analysis. The findings revealed that financial liberalization has a negative but insignificant impact on stock market volatility in Nigeria. It was therefore recommended that a good knowledge of financial liberalization is needed to enable financial experts and economy analysts effectively predict stock prices in order to stabilize the stock market.

Introduction

The issue of stock market volatility has long been of considerable interest to policy makers and financial analysts. Policy makers are interested in the main determinants of volatility and its spillover effects on real output, while financial analysts interest lies on the direct effect time-varying volatility exerts on the pricing and hedging of more exotic derivatives. In both cases, forecasting stock market volatility constitutes a formidable challenge but also a fundamental instrument to manage the risks faced by financial institutions. There are a lot of unresolved issues about what constitutes volatility and the degree of its measurement in the stock market. To resolve this, the first question that comes to mind is what is volatility? In simple terms, volatility refers to the frequency and severity with which the market price of an investment fluctuates. According to Chio (2008), volatility is the relative rate at which the price of security moves up and down. It is found by calculating the annualized standard deviation of daily changes in price. Implying that if the price of a stock moves up and down rapidly over short time period, it has high volatility, but if the price almost never changes, then. It has low volatility. Investors are happiest when market volatility is low, even though it means making less money. This scenario is most important to risk adverse investors.

Volatility, the conditional standard deviation of the stock return and its determinants has been studied over the years and many facts have been presented in the literature. One of the prominent facts is of volatility clustering; that is large or small shocks in stock prices tend to follow similar large or small shocks in macroeconomic variables. One reason for this might be that stock market volatility depends on the overall health of the economy, and real economic variables, which tend to display persistence (Chortareas, Mc Dernott and Ristsatos, 2000). While there appears to be a general consensus on what constitutes various forms of volatility such as:

returns volatility, price volatility and to a lesser extent, their determinants and how to measure them, there is far less agreement on the factors that fuel changes in stock market's volatility. Therefore, one pertinent and interesting question most financial experts and economists do ask till date is "what drives stock market volatility" The literature have revealed that certain macroeconomic variables such as financial liberalization, inflation and exchange rate are drivers of stock market volatility (see, Eriki and Udegbruna, 2001). But there seems to be inadequate empirical literature that examines the impact of financial liberalization on stock market volatility. It is against this backdrop that this paper tends to investigate the extent to which financial liberalization influences stock market volatility in Nigeria. This prompted the researcher to propose that financial liberalization has a significant impact on stock market volatility in Nigeria.

Literature Review

The stock market has become an essential market playing a vital role in economic prosperity that fosters capital formation and sustaining economic growth. Imoye (2009) claimed that stock markets are more than a place to trade securities; they operate as a facilitator between savers and users of capital by means of pooling of funds, sharing risks and transferring wealth. Stock markets are essential for economic growth as they insure the flow of resources to the most productive investment opportunities.

Recently determinants of share prices have been the issues of interests in financial economics literature. Researchers have developed many theoretical models describing the factors that influence share prices and stock returns. In spite of the theoretical constructs of share pricing in the literature, two major factors determine stock prices and their behaviour in the capital market. These are fundamental factors and technical factors (Imafidon and Amos, 2008). Several works showed that company fundamentals influencing stock prices include: performance of the company, change in the board of directors, appointment of new management, creation of new assets, dividends, earnings, among others, while the macroeconomic variables include: interest rate, exchange rate, inflation rate, money supply, industrial production.

Stock market volatility implies swings in the market as a whole. Stock market volatility has a number of negative implications. It affects the economy through its effect on consumer spending. Hamilton and Lia (1996) posited that the impact of stock market volatility on consumer spending is related via the wealth effect. Increased wealth will cause an upward movement in consumer spending. On the other hand, a fall in stock market will weaken consumer confidence and thus, drive down consumer spending. Stock market volatility may also affect business investment and economic growth directly. A rise in stock market volatility can be interpreted as a rise in risk of equity investment and thus a shift of funds to less risky assets. This move could lead to a rise in cost of funds to firms and thus, investors may turn to purchase the stocks of well-known firms.

Financial liberalization and stock market volatility

The past three decades have witnessed a rather unprecedented process of deregulation of financial markets and liberalization of cross-border capital flows. Oaikhenan and Udegbunam (2008) pointed out that capital flows arise from financial liberalization or capital account liberalization (removal of capital controls), that is, free flow of capital (long term and short term) across countries with little or no restriction. As Basu and Taylor (1999) noted that, in qualitative terms, market integration is now probably much deeper than it used to be as financial markets have increasingly become liberalized and securitized, while in quantitative terms, capital market

integration has at least reached the levels observed during the Gold Standard. These observations suggest that deregulation and liberalization of financial markets may enhance the degree of financial market integration. Especially in recent years, we did observe that financial markets had become highly and increasingly integrated. These developments allow investors to diversify their portfolios internationally. In the words of a Wall Street article, 'Over the past decades, US investors have poured buckets of money into overseas markets, in the form of international mutual funds. In April 1996, the total assets in these funds reached a whopping $148.14 billion, far beyond $2.49 billion as reported in 1985." At the same time, Japanese investors are investing heavily in US and other foreign financial markets in efforts to recycle their enormous trade surpluses. The markets become more integrated and move in tandem as this globalization trend keep growing (Yang and Hsu, 2009).

The literature on financial liberalization and macroeconomic uncertainty, despite being scarce, yields ambiguous conclusions due to problem of measurement. Financial integration may contribute to more output stability by providing greater access to capital that can help capital-poor countries diversify their production base. However, rising financial integration may lead to increasing specification of production, based on comparative advantage considerations, thereby making economies more vulnerable to industry-specific shocks

Alternatively, financial globalization may help promote institutional reforms that can make the financial system more stable, thereby contributing to more output stability. However, financial globalization makes it easier for capital inflows to fuel excessive risk-taking on the part of financial institutions and allows financial shocks to be transmitted more readily across borders (Mishkin, 2006).

Empirically while Huana and Kracaw (1994) and Rizwap and Khan (2007) found that financial liberalization does not significantly affect stock market volatility. Mishra (2004) showed that financial liberalization mitigates the consequences of external shocks. In addition to long-run effects, short-run considerations may play a role in the relationship. According to the sudden stop literature as indicated by Nwokoye (2012), capital account liberalization is systematically related to greater instability since capital flows are procyclical in nature, and this exacerbates economic fluctuations. Given that temporary shocks have large and persistent effects, that economies can exhibit cycles and that firms face credit constraints, more so, financial liberalization may actually destabilize, inducing chronic phases of growth with capital inflows followed by collapse with capital flight (Schwert, 1989). Moreover, sudden changes in the direction of capital flows could induce boom-bust cycles in developing countries which do not have deep financial sectors to cope with volatile capital flows. Also, the financial crisis literature predicts that financial globalization encourages risk-taking, generates financial fragility and increases financial crisis, which often have severe recessionary consequences (Huana and Krocaw, 1994; Hamilton and Lin, 1996).

These observations imply that the process of capital account liberalization is accompanied not only by financial deepening and institutional quality improving that have long-run impacts on macroeconomic uncertainty, but also by financial fragility and crisis that have short-run effects on business cycles. In other words, there may be a potential inter-temporal trade-off between openness and uncertainty. Accordingly, distinguishing the cyclical and trend components of financial openness in determining the effects of openness on uncertainty in the short and long-run, has important policy implications as: that how to supplement financial openness with policies that would improve this inter-temporal trade-off. The answer depends crucially on the time horizon of the analysis and cross- section experiences of countries. However, the empirical literature relies frequently on cross-country methodology and thus provides us with little guidance in evaluating the net effects of financial liberalization.

The real process of financial liberalization is dynamic and hard to measure, and a wide spectrum of empirical methodologies has been used to investigate this empirical issue. The most basic and common technique has been the use of unconditional cross-country correlations on stock prices and returns. However, \the arguments on the relative importance of industry and country-specific effects in explaining cross-country correlations and volatility are yet to be resolved. Later Vector Auto regressions (VARs) were widely used by researchers such as Engel and Rangel (2005). The availability of higher frequency data led to the use of ARCH variants. However, it is now known that ARCH is less useful for the non-normal distributions exhibited by market returns for some markets with skewness and excess kurtosis (Straumann, 2005). While on another front, both Univariate and Multivariate Co integration/Error Correction Models have been applied to model stock returns and prices for major and emerging markets. However, some argue that the long-run stable equilibrium relationships conjectured by these techniques are not suitable for modeling the dynamic process of stock market volatility as it is incomplete and continues to exhibit strong variations over time. Furthermore, only the existence of an equilibrating process and not the driving forces behind the long-run equilibrium are investigated in standard co integrating analyses.

There are some theoretical models that establish the link between financial liberalization and stock market volatility. In particular, these models show that as more and more traders join the market (as a result of openness), the volatility persistence tends to reduce. Prominent among others is the work of Tauchen and Pitts (1983) and Andersen (1996) as cited by Oduntan (2008). In recent years, several classes of Univariate and Multivariate GARCH models have been the major technique of choice for research into financial links across stock markets. This is due to the high degree of persistence in the conditional means and variances of asset prices at high frequency levels. It is also well accepted in the empirical finance literature that the volatility of rising and falling (especially during recessions and/or financial crisis) financial markets differ and that negative shocks (bad news) have a greater impact than positive shocks (good news). Hence, variants of these models have been used to accommodate the possibilities of non-normalities and asymmetries in the variance of returns (e.g. Bollerslev, 1986; Oduntan, 2008). Closely related to these are the regime switching models with time varying transition probabilities for different regimes.

To address variations in stock market over time, researchers have performed regressions on different sub-periods to gain insight into long-term changes in stock market volatility (Grunger, 2000). More recently, rolling and recursive windows and time varying coefficients generated by instrumental variables have also been employed in Ibrahim (2000). Correlations are crucial inputs for international portfolio management and direct measures for dynamic market integration. Many recent studies provide evidence that correlation is evolving through time (Engel and Rangel, 2005; Yang and Hsu, 2009). The covariance between national markets could change due to the dynamic evolution of volatilities in national markets, but also changes financial openness across markets. While focusing on the market correlation allows investors to be aware of the interdependence between markets. Mishra (2004) pointed out that the internationalization of capital markets as a result of financial openness, has resulted in inflow of huge sums of funds between countries and in the cross listing of equities. This has prompted investors and firms to more interest in the issue of the degree of volatility of the stock market as a result of financial transactions across borders.

International trade theories assert that financial openness or liberalization arising from removal of barriers and to the free flow of financial services across national borders benefits participating nations (Caves and Jones, 1991). The implication is that, countries. The implication is that, countries participating in the international financial intermediation are benefactors. Such

gains are usually explained in terms of welfare maximization, improved technology, more liquid markets, among others. It is against this background, that financial liberalization is deemed to affect a country's net capital flow. The reasoning here is that open economies engage more in higher level of financial transactions with the rest of the world. This implies that the more open an economy is, the higher the volume of financial inflows and outflows of financial services. The way and manner openness or liberalization impacts on the net capital flows depends on the extent to which capital inflows tend to grow in response to financial reforms on the one hand and the response of market capitalization on the other hand. If the response of market capitalization is favourable and significantly outweighs the corresponding rise in capital inflows demand, then the effect of increased financial openness on the net capital flows would tend to be positive. The stock market liquidity position would tend to worsen if and only if, the demand for capital inflows significantly outweighs the response of domestic interest rates which however would discourage investment.

The degree of financial openness could be measured in various ways, the most obvious which form the focus of the work is the ratio of capital inflows less capital outflows to real Gross Domestic Product. The extent to which financial openness affects a country's net capital flows which in turn influence market capitalization, depends on the size of these ratios (i.e. capital inflow to GDP and Capital outflow to GDP). Countries with relatively large capital outflow to GDP ratios will no doubt have favourable net capital flow position, while countries with high capital inflows to GDP ratio will tend to experience unfavourable movement in their net capital flow position.

Methodology

Since the introduction of ARCH and GARCH models by Engle (1982) and Bollerslev (1986) respectively, there has been an explosion of research looking for the dynamics of stock market volatility. In order to generate the necessary data for this study, stock market was operationalized as market capitalization (MKTCAP), while financial liberalization was measured in terms of Net Capital Flow (NCF). The NCF is the resultant effect of capital inflows less capital outflows to real Gross Domestic Product (GDP) ratio. The data on market capitalization and net capital flow, were sourced mainly from the Central Bank of Nigeria (CBN) statistical Bulletin of various years for a period of thirty-two (32) years (i.e 1981-2008). This scope is to capture the effect of the recent pre and post financial reforms period. The data were analyzed using the regression analysis, which was computed using the Statistical Package for Social Science (SPSS) version 17.

The simple regression model for this study is as shown thus;

$MKTCAP = f[\alpha_0 + B_1 NCF + \ldots. \mu_i]$

Where MKTCAP = Market Capitalization

NCF = Net Capital Flow

μi = Error Term

Table 1: The impact of financial liberalization on stock market volatility

Statistical Variables	**Values**
Co-efficient of correlation (R)	0.007
Co-efficient of Determination (R^2)	0.000
Intercept (α)	2442.243
Partial Regression Co-efficient (β_1)	0.006
P-value	0.969

Source: SPSS Version 17 Window Output

The table above shows an R-value of 0.004, which is close to 1.0 from, the negative side. This implies that financial openness has a very weak relationship with stock market volatility. More so, the regression co-efficient revealed that 1% change in financial liberalization brings about less than 1% (0.6%) negative change in market capitalization thereby resulting to a low volatility of stock market. The P-value (0.969) indicates an insignificant impact. This implies that financial liberalization has a negative but insignificant impact on stock market volatility in Nigeria. Our result agrees with Huang and Kracaw (1994) and Rizwan and \Khan (2007).

Conclusion and recommendations

The stock market provides relevant data on each listed security to enable individuals evaluate their portfolios. Such information includes the current stock price when the stock was last traded; what is the dividend declared and when? And what is the price- earning ratio? By making stocks to be liquid and attractive to many investors, the stock market helps in ensuring fair dispersal of stock holding across the nation and assists in indigenization of investment base of the economy. The price at which a security can be bought or sold on the stock market depends on the relative strength of the demand for and the supply of that particular security at a particular point. All sorts of influences affect stock prices thereby making the stock markets become volatile. If business prospects are good, stock prices will generally be high but if prospects are poor, prices will be low. Macroeconomic problems of high inflation rates and interest rates; high degree of volatility in exchange rate; and liberalization of the financial markets, are significant conditions for stock market volatility.

References

Benita, G. and Lauterbach, B. (2004) Policy, factors and exchange rate volatility- panal data versus a specific country analysis; Research Unit, Foreign Exchange Activity Department; Bank of Israel; Jerusalem.

Bollerslev, T. (1986) Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics* 31: 307-327.

Caves, R. and Jones, R. (1991) *World trade and payment*; Little and Brown and Co. (Anode) Ltd., p. 98.

CBN (2000) *Statistical bulletin;* Annual Publication of Central Bank of Nigeria, Statistical Department, Vol. 18

Choi, D.F.S (2008) Volatility spillovers between stock market returns and exchange rate changes. the New Zealand cases; *International Journal of Modern Economics*; 2(1); 64 – 83

Chortareas, G.E; McDernott, J.B and Ristsatos, T.E (2000) Stock market volatility in an emerging market-further evidence from the Athens stock exchange", *Journal of Business Finance and Accounting;* Vol. 27; No 7; pp 983.

Davis, N. and Kutan, A.M. (2003) Inflation and output as predictors of stock returns and volatility: international evidence; *Applied Financial Economics,* 13: 693-700.

Engle, R. F. (1982) Autoregressive conditional heteroscedasticity with estimates of the variance of United Kingdom inflation; *Econometrica* 50(4): 987- 1007.

Engle, R.F and J.G Rangel (2005) The SPLINE GARCH model for unconditional volatility and its global microeconomics causes; Paper presented at the World Congress of the Econometric Society, London.

Eriki, P.O. and Udegbunam, R.I. (2001) Inflation and stock price behaviour: evidence from Nigerian stock market; *Journal of Financial Management and Analysis- International Review of Finance*; 14(1) 1-10

Granger, C.E (2000) A bivariate causality between stock prices and exchange rates: evidence from recent Asian fly, *Quarterly Review of Economics and Finance*; 40(3); 337-354.

Hamilton, J.D. and Lin, G. (1996) Stock market volatility and the business cycle; *Journal of Applied Econometrics*, 11:573-593.

Huang, R.D. and Kracaw, W.A (1994) Stock market returns and real activity: A Note". *Journal of Finance*, 39: 267-72.

Ibrahim, M.H. (2000) Cointegration and granger causality tests of stock price and exchange rate interactions in Malaysia, *Asian Economic Bulletin* 17(1): 36-46.

Imafidon, K. and Amos, A.O. (2008) Company fundamentals as determinants of stock prices; *Finance and Banking Review* (FBR), 2(1);.69-80

Imoye, A. (2009) Global financial crisis, stock exchange crash and the lessons from Nigeria. www.businessdaylonline.com

Kanas, A. (2000) Volatility spillover between stock returns and exchange rate changes, *Journal of Business Finance and Accounting*, 27, 448-468.

Kaul, G. (1987) Stock returns and inflation: the role of monetary sector; *Journal of Financial Economics*, 18:253-276.

Ming-Shiun, P. Chi-Wing, F.R and Liu, Y.K (2007) Dynamic linkages between exchange rates and stock prices: Evidence from East Asian Markets", nt. Rev. Con. Finance. 16:503-520.

Mishkin, F.S (2001) The *economics of money, banking and financial markets*; New York: Addison Wesley.

Mishra, K.A (2004) Stock market and foreign exchange market in India- are they related? *South Asia Economic Journal* 5(2) 1774-187

Morley, B. and Pentecost, J.E. (2000), Common trends and cycles in G-7 Countries exchange rates and stock prices; *Applied Economic Letters,* 7:7-10.

Ndri. K. L. (2008) The effects of interest rates volatility on stock returns and volatility: evidence from Korea; *International Research Journal of Finance and Economics, Issue* 14; 285-290.

Nwokoye, G. A (2012) Financial openness, inflation and exchange rate and Nigerian stock market volatility: an econometric investigation; *Ph.D Seminar Paper Presented to the Department of Business Administration*, University of Benin, Benin City

Oduntan, S. (2008) The NSE and the financial crisis
www.allafrica.com/stories/200811630342.

Okoye, P.V.C and Akamobi, L.N. (2009) The impact of global financial meltdown on capital formation - a study of the Nigerian stock market; *Journal of Business and Financial Studies*; Vol. 1; No 1;50-53.

Okwoli, A.A. (2009) The use of ratios in financial analysis and prediction of financial crisis; in Mainoma, M. (Ed.) *Financial Management and Control*; Kaduna; Joyce publishers.

Osamwonyi, I.O. and Akingunola, R.O. (2008) An analysis of the returns variability of selected Nigerian quoted stocks; *Management Sciences Review*; Vol. 1; No 1;78.

Rizwan, M.F and Khan, S.U (2007) Stock return volatility in emerging equity market- the relative effects of country and global factors; *International Review of Business Research Papers*, 3(2) pp. 362375

Saryal, F.S. (2007) Does inflation have an impact on conditional stock market volatility; evidence from Turkey and Canada; *International Research Journal of Finance and Economics* 11:123-133.

Schnabl, G. (2007) Exchange rate volatility and growth in small open economies at the EMI Periphery; ECB Working Paper No. 773.

Schwert, W.G. (1989) Why does stock market volatility change over time; *Journal of Finance*; 44(11) 15-1153

Sentana, E. (1995) Quadratic ARCH models; *Review of Economic Studies*, 62:639:661.

Serven, L. (2003) Real exchange rate uncertainty and private investment in Developing Countries; *Review of Economics and Statistics*, 85, 212-217.

Shittu, O.I and Yaya, 0.S. (2010) On the impact of inflation and exchange rate on conditional stock market volatility - a re-assessment; *American Journal of Scientific and Industrial Research*; Vol. 1, (2); pp. 116.

Solnik, B. (1987) Using financial prices to test exchange rate models-a note; *Journal of Finance*, 42, 141-149.

Straumann, D. (2005) *Estimation in conditionally heteroscedastic time series models*; Berlin; Springer-Verlag.

Tsay, R.S. (2005) Analysis of financial time series; *Wiley Interscience*, 2 Edition.

Yang, S.Y and Hsu, H.C (2009) Financial openness and dynamic stock market integration; *A Proposal to the 2009 FMA Meeting; National Chung Hsing University, Taiwan*.

Yucel, T. and Kurt G. (2003) *Foreign exchange rate sensitivity and stock prices- estimating economic exposure of Turkish firms*. Madrid: European Trade Study Group.

APPENDIX

Data on Market Capitalization (MKTCAP) and Net Capital Flow (NCF)

Years	MKTCAP N, B	NCF
1981	5.0	204.4
1982	5.0	238.4
1983	5.7	664.1
1984	5.5	-58.9
1985	6.6	291.8
1986	6.8	652.7
1987	8.	1119.6
1988	10.1	795.6
1989	12.8	661.6
1990	16.3	6072.4
1991	23.1	77.2
1992	31.2	8964.4
1993	47.5	17803.1
1994	66.3	214.8
1995	180.4	16936.4
1996	285.8	-535.5
1997	281.9	1071.8
1998	262.6	-986.5
1999	300.0	-76.2
2000	472.3	14353.9
2001	662.5	-24.1
2002	764.9	902.4
2003	1359.3	1461.5
2004	2112.5	1326.7
2005	2900.1	1724.7
2006	5121.0	2759.5
2007	13294.6	3449.7
2008	9516.2	2655.7
2009	9310.6	2955.0
2010	10707.1	3020.1
2011	9844.6	2876.9
2012	9954.1	2950.7

Source; CBN Statistical Bulletin of various years