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Working Paper

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Global Journal of Arts, Humanities and Social Sciences
Vol.9, No.4, pp.46-63, 2021
Print ISSN: 2052-6350(Print)
Online ISSN: 2052-6369(Online)

FINANCIAL GLOBALIZATION AND EXCHANGE RATE UNCERTAINTY IN NIGERIA: A BAND-PASS FILTER APPROACH

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ABSTRACT: *Exchange rate uncertainty has been one of the many challenges implicated as the biggest developmental and growth obstacle facing Nigeria as a nation. This study estimates financial globalization, output growth and financial uncertainty nexus in Nigeria. The research is carried under the assumption that exchange rate uncertainties are deemed to impact on the volume of export and import trading activities. Thus, we adopted the Pairwise Granger Causality model to estimate the causality relationships among financial globalization, output growth and volatility in exchange rate using a Single Equation Englo-Granger approach. The best lag selection criteria were employed to choosing the best lag for this analysis. We provide a link between the short-run and the long-run effect of the model(s). This study found that they is a positive interaction between financial volatility (exchange rate uncertainty) and output volatility in Nigeria. It shows that as financial volatility such as exchange rate uncertainty is increasing, output volatility will also be increased in the same direction. The government and the monetary authorities should be more focused on the strengthening the exchange rate, since stable exchange rate improves the terms of trade, strengthen the local capacity and increases output growth. However, addressing the heightened risks, including financial and operational risks due to economic recession as well as due to the market reforms themselves have remained the challenges of globalization in Nigeria.*

KEYWORDS: financial globalization, exchange rate, Nigeria, band-pass filter approach

INTRODUCTION

Universally, one of the key factors of engine of growth of the advanced and developing economy is financial globalization. The differences in endowment in natural resource encourage regional and global interdependence of economies, since the demand in foreign transactions in goods and services, natural resources, capital and labour explain the new inclination of financial globalization. The exponentially growth recorded in information and communication technology has hearten and encourage financial globalization process currently, and infiltrated in connectivity, partly via the internet, has reduced the costs of movement of goods, services and

other forms of capital across the globe. Means of doing businesses or production processes have become increasingly internationalized as companies have established affiliates abroad to gain access to foreign markets and reduce input costs, while supply chains have been set up on a global scale as a way of gaining a competitive edge (Udeh, 2010).

Globalization generally is an increasing integration or interaction of national economic system through growth in international trade, investment, and capital flows; thereby leading to output growth (Ajayi & Atanda, 2012). Globalization leads to international trade, financial integration, international labour flows, technical change and economic growth (Nwokoma, 2004). On the other hand, financial globalization represents increasing global linkages created through cross-border financial flows (Prasad, Rogoff, Wei, & Kose, 2007). It is characterized by capital flows from an industrial economy to developing ones. The factors that influence the level or degree of financial globalization of a country are the nominal exchange rate, the level of financial development and trade (Adegbite & Adetiloye, 2013).

Alimi & Atanda, (2011) are of the view that the new means of capital flows and the increasing use of international financial intermediaries constitute two of the most important developments in financial globalization. Based on this, the composition of capital flows to developing countries and Nigeria particularly has changed significantly recently. In their view, private capital flows became the major source of capital for a large number of emerging economies, leading to the internationalization of financial services, that is, the use of international financial intermediaries by local borrowers and investors. The internationalization of financial services is achieved through two main channels. The first channel is an increased presence of international financial intermediaries, mainly foreign banks, in local markets. The second channel involves the use of international financial intermediaries that are located outside the country by local borrowers and investors (Alimi & Atanda, 2011).

On this ground, financial globalization is the integration of financial markets of all countries of the world into one. This is only possible provided uniformity can be brought in the terms and conditions across the globe for raising international loans. The existence of different currencies with their different degrees of convertibility prevents uniformity in the terms and the conditions for loans. The recent wield of financial globalization that has occurred since the mid-1980s has been marked by a surge in capital flows among industrial countries and, more notably, between industrial and developing countries. Although capital inflows have been associated with high growth rates in some developing countries, a number of them have also experienced periodic collapses in growth rates and significant financial crises that have had substantial macroeconomic and social costs.

However, financial globalization turned into becomes the major variable in explaining developments in output growth worldwide. It has more than doubled worldwide in the period 1980-2013 (Obiechina, 2010). In Nigeria, financial globalization is even more than three times as high as in the 1980s. From the Central Bank of Nigeria (CBN, 2013) statistics, the net portfolio investment (NPI) and net direct investment (NDI) were N151.6 million andN735.8 million in 1986, which rose to N51, 079.13 million and N115, 952.2 million in 2000, indicating a growth rate of 33,593.36 and 15,658.66 per cent, respectively. In 2005, net portfolio investment and net direct investment went up to N116, 035.00 million and N654, 193.10 million indicating a growth rate of 127.17 and 464.19 percent, respectively, compared with the 2000 figures. Furthermore, they both grew by 202.43 percent and 22.69 percent to N350, 919.40 million and N802, 615.70 million in 2008, respectively, when compared with the 2005 figures (CBN, 2013).

Uncertainty has a substantial link with questions of prospect, instability, anticipation and stability and plays a critical role in the transmission and effectiveness of economic policy. According to Montes (2010), uncertainty is a feature of the real world that influences the decision-making process of economic agents and undermines the effectiveness of monetary policy. Insufficient knowledge of the economic system could deter policy actions from having the desired effects while poor understanding of the consequences of monetary policy would lead to mis-judgement and extremely levitate the costs of achieving policy goals (Ononugbo, 2012). Hence, macroeconomic uncertainty may affect policy actions (or inactions), while policy uncertainty not knowing how the policy maker will act can spook the financial market.

Exchange rate is the value of a country's currency expressed in comparison to some other country's currency and has much impact on the economic development and standard of living of any country, such that how strong or weak its value is in comparison to other currency especially the dollar has an implication on the strength or weakness of the domestic currency and country's economy. Mordi, (2006) noted that exchange rate is an important price variable in an economy which performs the twin role of maintaining international competitiveness and serving as nominal anchor to domestic price.

The mere magnitude of gross capital flows makes it necessary to examine the effect of financial globalization on output growth in Nigeria. The emergence of Nigeria into financial globalization started significantly with the advent of Structural Adjustment Programme (SAP) in 1986 in collaboration with the International Monetary Fund (IMF) and World Bank which led towards external liberation focusing on the market-oriented economic system, export-led strategy, and stability of the economy. Using the capital opening index and average exchange rates as an indicator of financial globalization for Nigeria, the greater the level of financial globalization, the more Nigeria experienced capital outflows an indication that the financial globalization process

has increased the interest of Nigerians to acquire assets externally resulting in loss of capital (Alimi & Atanda, 2011).

The integration of Nigeria into the global financial village entails uniformity with the rest of the world in the terms and conditions for raising international loans, (Awoyemi & Jabar, 2014). This integration has necessitated many economic reforms programs carried out in the country to enable the country to participate fully in the international market. Notable such reforms are the financial sector reforms and trade reforms. All these reforms especially the financial sector reforms are purported to be the transmission mechanism for the performance of various macroeconomic variables thereby propelling output growth.

Financial globalization, which is characterized by an intensification of increased financial and foreign direct investment flows promoted by rapid liberalization, presupposes that globalization is beneficial to the extent that it can lead to increase in capital flows and output growth (Mougani, 2012). Yet the concomitant unequal distribution of these benefits and the fear about the negative impact of globalization in a high financial risk country like ours has made the question on the financial globalization-output growth-financial volatility nexus to be a debatable issue in the country (Iyoko & Eboreime, 2009). For instance, evidence has shown that financial openness especially short-term investments can deepen or even trigger economic crises (Stieglitzs, 2000).

Theoretically, the globalization of financial markets is in principle favourable for productivity-enhancing reallocation. Globalization has contributed to the development of richer markets with public trading of equity funds across the globe as well as the development of hedge funds, venture capital funds and private equity funds that not only operate in advanced economies but also in emerging markets and Nigeria is not an aberration. Such richer financial markets in principle yield better allocation of financial risk through diversification and the richer financial instruments available. In Nigeria, like other developing economies, it is also clear, especially from the past few years, that global financial markets are fragile and subject to sudden collapses in some segments which can become contagious in other segments of the market. Such fragility in financial markets can act as a source of undesirable volatility in financial instruments and a distortion to productivity-enhancing reallocation and output growth. That is, when financial markets break down, a business may contract or shut down not so much because it is a low-productivity business but because financial markets are no longer able to allocate credit to even potentially profitable businesses and this negatively influence the output growth of the country, just like Nigeria economy is experiencing currently.

Researchers from Nigeria, such as Awoyemi and Jabar (2014) have found that financial globalization has crowded out autonomous investment leading to volatility and decline in output growth. The pains associated with financial globalization are in various forms (Prasad, 2007). First, international investors have been engaging in momentum trading and herding, which have been destabilizing for developing economies. Second, international investors have (together with domestic residents) engaged in speculative attacks on developing countries' currencies, thereby causing instability that is not warranted based on their economic and policy fundamentals. Third, the risk of contagion presents a major threat to otherwise healthy countries, since international investors could withdraw capital from these countries for reasons unrelated to domestic factors. This particularly led to the recent global financial crisis which affected many countries and exposed them to high financial risk, including Nigeria. Fourth, financial globalization has made it easier for many governments to incur excessive amounts of debt (Eswar , 2003).

On the contrary, other researchers have argued that financial openness may absorb exogenous or domestic shocks. They are of the opinion that financial openness gives firms and consumers the flexibility to adjust to shocks through reallocating resources across geographic areas (Loayza., 2007). They support their view with the fact that a variety of theories imply that the volatility of output should decrease as the degree of financial integration increases; the essence of global financial diversification is that a country is able to shift some of its income risk to world markets (Mishkin, 2005). Proponents of this are of the opinion that since most developing countries are rather specialized in their output and factor endowment structures, they can, in theory, obtain even bigger gains than developed countries through international consumption risk sharing-that is, by effectively selling off a stake in their domestic output in return for a stake in global output (Prasad, 2007). Thus, Nigeria has not been far from such consequences of financial globalization previously or recently with the country having experienced the proliferation of financial sector/bank and currency crises.

The stand of these arguments in Nigeria forms the core basic interest of this study. In Nigeria, the increase in capital flight (when many foreign investors started withdrawing their investment from the country, especially in the capital market) with the consequences of the decline in output growth, high financial volatility and risk and the general economic recession current experience have re-echoed negative effects of financial globalization to an economy with high financial risk. Thus, empirical results on the relationship between output growth and financial globalization are either inclusive or ambiguous. While several types of research using different approaches have found output growth to be enhanced by globalization and its channels (Ojo & Oshikoya, 1995; Edwards, 1998; Ben-David, 2000), others found a negative effect of globalization characterized by openness and FDI on output growth (Ndiyo & Ebong, 2003; Edison 2002; Reisen & Solo-2001).

Another major controversy from the past research efforts in Nigeria on this subjects is on the variations in the findings and conclusions, which emanated from the fact that adequate measurement for financial globalization remains unsettled in the literature. Most of the studies used either de jure or de facto measures. Most prominently used de jure measures are indicator variables for equity market liberalization (Bekaert & Harvey, 2000). But studies have argued that de jure measures cannot capture the actual effect of capital controls or openness (Rogoff , 2006). A country which has very liberal capital account laws does not necessarily have to be heavily involved in international financial investments. Furthermore, liberalizations do not necessarily happen at one point in time but materialize gradually. In contrast, de facto' variables are continuous variables and do not suffer from those drawbacks. The most commonly used de facto measure for financial globalization is gross capital flows in percent of GDP (Kose , 2003, 2008).

This study will go a step further in adopting the two measures to see the financial globalization measure that will be more robust and significant for the Nigerian economy. The study will also go further in analyzing the topic by incorporating the financial risk variable that previous studies ignored. This is because countries with high financial risk suffer from financial globalization because of their output volatility increases, thus, whether financial globalization increases or decreases output growth depends on the level of financial risk (Meller, 2008). This study, therefore, examines the dynamic interaction among financial globalization and exchange rate uncertainty.

It is a country-specific study that focuses on the linkage between financial globalization, exchange rate exchange rate uncertainty in Nigeria. The study used quarterly data from 140 observations (1981Q1 – 2016Q4) to estimate this relationship. Thus, the study adopted the three most commonly used index of financial globalization, which includes Financial Openness (FOP), measured in this analysis as the sum of gross stocks of foreign liabilities and assets as a ratio to GDP (Rogoff, et al, 2006), Trade Openness (TOP), measured as the ratio of exports plus imports to GDP, and the standard deviation of Terms of Trade (TOT) in goods and services, which accounts for supply shocks in the analysis. Others variables used for the analyses in different objectives include output growth (OUTPUT), Exchange Rate uncertainty, the volatility in growth rate of gross domestic product (OUTPUTV), inflation rate, used to capture monetary policy quality in the country, and prime lending rate, which accounts for the risk free interest rate in the analysis.

EMPIRICAL LITERATURE

On the relation between financial globalization and output growth and volatility, empirical evidence is as diverse as theoretical predictions. Some studies find a positive link, others a negative

link, but most studies find no significant or stable relationship at all. Mendoza (1994) employs a stochastic dynamic business cycle model and finds that quantitative changes in the volatility of output and consumption are quite small in response to the changes in the degree of financial integration. He also finds that when shocks are larger and more persistent, the growth in output will reduce and volatility of output increases with the degree of financial integration.

Wei, (2018) examine the challenges and gains of financial globalization for developing countries based on a survey of the recent literature on financial globalization. First, he finds that while capital account openness holds promises (by potentially generating a lower cost of capital, better risk sharing, and stronger disciplines on policies), they do not always work out that way in the data. Distortions in the domestic financial market, international capital market, domestic labour market, and domestic public governance where found to make financial globalization less beneficial for developing countries. Wei, recommended that developing countries sometimes need to insulate themselves from foreign monetary policy shocks. His empirical pattern appears to be somewhere between a trilemma and a dilemma. While nominal exchange rate flexibility is insufficient for policy autonomy, capital flow management may be needed to confer more monetary policy autonomy.

Maduka, Madichie, & Eze, (2017) used the contemporary econometric techniques of cointegration and error correction mechanism, within the framework of the Pesaran (2001) ARDL model to examine the impact of globalization on economic growth in Nigeria. Using annualized secondary time series data from 1970 to 2015, they find that trade openness; financial integration and foreign direct investment have significant positive impact on economic growth in Nigeria. Based on this, they suggested that adequate mechanism should be put in place to ensure that globalization brings about the desired pace of economic growth. Arguing that the gains from integration of the Nigerian economy into the global economy, over decades, have remained below expectation, when compared with the gains made by other countries of the world.

Omolade, Morakinyo and Ifeacho (2013) investigated the nexus between globalization and economic development of Nigeria over the period 1980 – 2011. The study employed Johansen cointegration and Granger causality tests and revealed that trade openness relates negatively with economic development in Nigeria. The study further revealed that a unidirectional causality flows from economic development to globalization without such in reversed order and that trade partners appear to be gaining more than the country especially the developed trade partners.

Nwakanma and Ibe (2014) examined the causal relationship between globalization and economic growth in Nigeria from 1981 to 2012. In carrying out the study, Johansen cointegration and

Granger causality tests were employed. The results show that there is a positive and insignificant relationship between financial integration, human resource development and trade openness, while gross fixed capital formation was negative and insignificant. The results further revealed that a unidirectional causality runs from financial integration to gross fixed capital formation. Okpokpo, Ifelunini and Osuyali (2014) through their study interrogated globalization as a potent driver of economic growth in Nigeria using the non-oil (agricultural and manufacturing) export as reference point from 1970 – 2011. The study employed the ADF unit root test and OLS technique and found that globalization has no significant impact on non-oil export and that globalization has not been a potent driver of growth of the non-oil export in Nigeria.

Shuaib, Ekeria and Ogedengbe (2015) examined the impact of globalization on the growth of the Nigerian economy over the period 1960 – 2010. The study employed the Johansen cointegration and error correction model and found that growth of external debt ratio was inversely related to economic growth in Nigeria. Utuk (2015) analyzed the impact of globalization on economic growth in Nigeria in terms of trade and capital flows from 1970 – 2011. Using descriptive method of analysis, the study found that increased trade and capital flows engendered by globalization can enhance the country's growth performance. Adesoye, Ajike and Maku (2015) examined the impact of economic globalization on output growth of the Nigerian economy over the period 1970 – 2013. The study employed Engle-Granger cointegration and error correction model and found that a higher exchange rate and inflation rate, an increase in foreign direct investment, growth in trade and openness and a lesser interest rate enhance the growth rate of output in Nigeria.

METHODOLOGY

Globalization gain for the domestic country (see Nigeria), calculations here closely follow the methodology employed in van Wincoop (1994, 1999). In the model economy, there are N countries which can trade in claims on their endowment streams when there is perfect consumption risk sharing. Residents in each country have the same preferences and expected utility. Thus, given the countries expected utility E(U) derived from globalization (in our case, financial globalization) the endowment y_i at time t, and follows a random walk with drift is given as:

$$dy_{it} = \mu y_{it} dt + \sigma y_{it} d\eta_i \quad \text{---------- (1)}$$

Where

η = a standard Brownian motion

Let's represents the correlation between the innovations of endowment growth across two different countries as $\rho = d\eta_i d\eta_k$ $(i \neq k)$. In the first environment, there is no additional risk sharing

relative to what is already implied by observed consumption behavior and domestic consumption is equal to domestic output, $c_{it} = y_{it}$.

In the second environment, there is perfect consumption risk sharing as countries are able to diversify away all country-specific risk associated with domestic consumption. This implies that consumption in each country is equal to the per capita world endowment, which is denoted by y^w. Aggregate consumption of a representative country (say Nigeria) in this case follows approximately a random walk process with variance in the form:

$$\sigma_w^2 = \sigma^2((1/N) + (1-1/N)\rho) \quad \text{---------- (2)}$$

Where

σ_w^2 = variance in aggregate consumption of a representative country

N = number of observations

ρ = parameters to be estimated

There are four major parameters affecting the magnitude of financial globalization gains according to van Wincoop (1994): (1) the volatility of domestic output; (2) the rate of relative risk aversion; (3) the risk-adjusted growth rate, and (4) the risk-free exchange and interest rate. A decrease in the risk-free exchange rate translates into larger financial globalization gains while a decrease in the risk aversion coefficient is associated with smaller gains. The financial globalization gains get smaller with the correlation between domestic consumption and the world consumption while they tend to increase in the volatility of consumption series.

Model Specification

Following dynamic Representative Agent Models and in line with van Wincoop (1994), financial globalization could influence; (1) the volatility of domestic output; (2) the rate of relative risk aversion; (3) the risk-adjusted growth rate, and (4) the risk-free rate of exchange. Thus, Output Growth (OUTPUT) and Exchange Rate Volatility (EXRV) are the two dependent variables for objectives 1 & 2. For the rate of relative risk aversion, the study includes the supply shock variable, measured by changes in Terms of Trade (TOT), Trade Openness (TOP). Also included is the Financial Openness (FOP) variable measured in this analysis as the sum of gross stocks of foreign liabilities and assets as a ratio to GDP (Rogoff, et al, 2006).

This study is meant to answer the question of the extent to which financial globalization/integration has contributed to the volatility of financial instruments, such as exchange rate uncertainty in Nigerian. In modelling this, we specified financial openness variables, such as financial openness measured by the stocks of foreign assets and liabilities as a share of GDP (FOP), trade openness measure as exports plus imports as a ratio of GDP (TOP), the standard deviation of terms of trade

in goods and services proxy for supply shock (TOT) against exchange rate volatility (EXRV), controlled by the volatility in growth rate of gross domestic product (OUTPUTV).
That is:

EXRV = f (FOP, TOP, TOT, OUTPUT) ---------- (5)

where

EXRV = exchange rate volatility,

FOP = financial openness measured by the stocks of foreign assets and liabilities as a share of GDP,

TOP = trade openness measure as exports plus imports as a ratio of GDP,

TOT = the standard deviation of terms of trade in goods and services proxy for a supply shock

OUTPUTV = volatility in the growth rate of the gross domestic product.

Thus, transforming the above function into an econometric specification yields the following;

$$EXRV_t = \lambda_0 + \lambda_1 FOP_t + \lambda_2 TOP_t + \lambda_3 TOT_t + \lambda_4 OUTPUT_t + \varepsilon_t \quad \text{---------- (6)}$$

Where

λ_0 = the intercept

λ_1 to λ_4 = the estimated parameters of the model

ε_t = the stochastic error term

It further estimates the causality links between financial globalization and exchange rate volatility in Nigeria. As shown in Engle and Granger (1987) when the series x and y are cointegrated a standard Granger-causality test should be estimated. However, this does not allow for the distinction between the short-run and the long run-effect. Thus, we adopted the Pairwise Granger Causality model to estimate the causality relationships among financial globalization, output growth and volatility in exchange rate using a Single Equation Englo-Granger approach. The best lag selection criteria were employed to choosing the best lag for this analysis. We provide a link between the short-run and the long-run effect of the model(s). In the estimation, we included the three financial globalization variables used for our analysis, such as Financial Openness (FOP), Trade Openness (TOP) and Terms of Trade (TOT). Others are output growth (OUTPUT) and volatility in the exchange rate (EXRV)

The specification for estimating this model is given in the following equations (7).

$$\Delta FOP_t = (\alpha_1 - 1)\Delta FOP_{t-1} + \delta_0 \Delta TOP_t + (\delta_0 + \delta_1)\Delta TOP_{t-1} + \ldots + \phi_0 \Delta EXR_t + (\phi_0 + \phi_1)\Delta EXR_{t-1} + \varphi(FOP_{t-2} - TOP_{t-2}) + \eta TOP_{t-2} + f_t + \upsilon_t$$

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------- (7)

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$$\Delta EXR_t = (\phi_1 - 1)\Delta EXR_{t-1} + \delta_0 \Delta TOP_t + (\delta_0 + \delta_1)\Delta TOP_{t-1} + \ldots + \alpha_0 \Delta FOP_t + (\alpha_0 + \alpha_1)\Delta FOP_{t-1} + \varphi(FOP_{t-2} - TOP_{t-2}) + \eta TOP_{t-2} + f_t + \upsilon_t$$

A crucial preliminary step in the estimation procedure consists in classifying the regressors as strictly exogenous, predetermined or endogenous variables. This classification has important implications in terms of the proper choice of variables. Thus, in this model, no variable is assumed to be predetermined.

RESULTS

TABLE 4.3: Summary of Group Unit Root Analysis

VARIABLE	LEVEL			1ST DIFFERENCE		
	Statistic	Prob.	Cross-Sections	Statistic	Prob.	Cross-Sections
Levin, Lin & Chu t*	-2.01786*	0.0218	7	-4.48803**	0.0000	7
Breitung t-stat.	-0.53160	0.2975	7	-3.10469**	0.0010	7
	-2.70568*	0.0034	7	-4.48803**	0.0000	7
Im, Pesaran & Shin	*					
	31.2723*	0.0051	7	48.5634**	0.0000	7
ADF-Fisher Chi-sq.	*					
PP-Fisher Chi-sq.	11.2117	0.6693	7	57.6746**	0.0000	7

Note: ** indicates significance at 5% and 1% level.

Source: EViews 9.5 estimate

From the above result, the Breitung t-statistic and PP-Fisher Chi-square indicates that there is unit root in the 7 cross-section variables while the other three approaches rejected the presence of unit root at both 5% and 1% significance levels. Thus, the estimates adopt the results of the two

methods that dictated unit root in the series, since the Breitung t-statistic and PP-Fisher Chi-square tests differ because they provide a more robust test for serial correlation and time-dependent heteroskedasticity of the stochastic process. However, at the 1st difference, the 5 approaches unanimously rejected the null hypothesis of a unit root, implying that the variables are stationary at the 1st difference ($\Delta = 1$), a prerequisite for the presence of long-run linear combination among the variables.

Single-Equation Co-integration Test

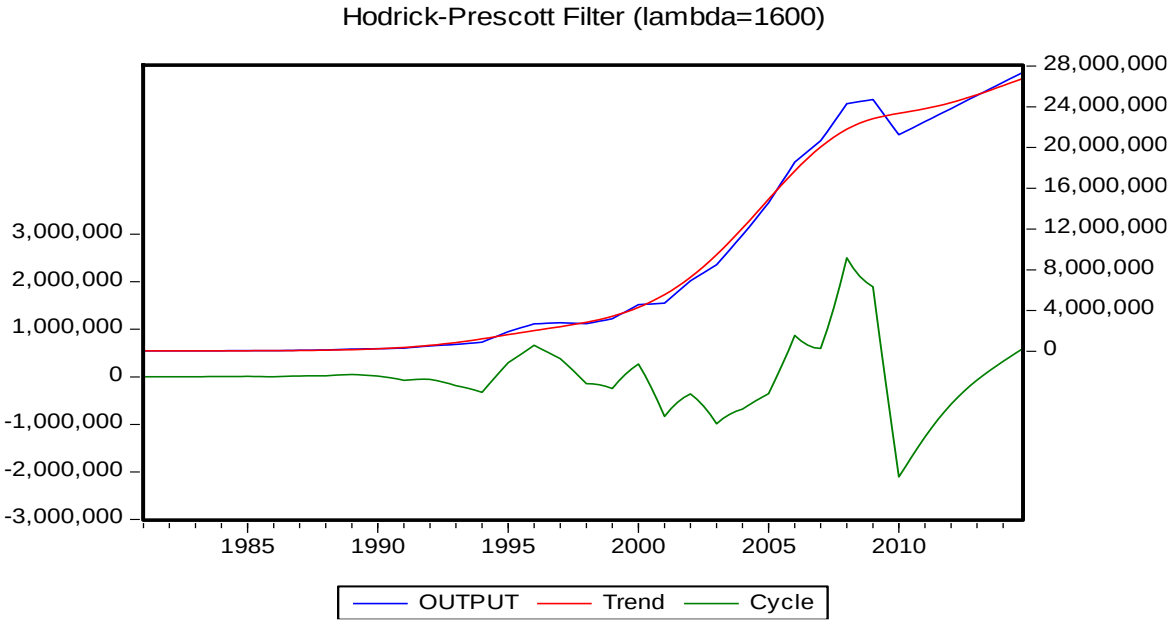
This test seeks to identify the number of co-integrating relationships that exist among variables of interest. We adopt a Single-Equation co-integration method developed by Engle-Granger. This test identifies the number of stationary long-run relationships that exist among the set of integrated variables. It offers two tests, the tau-statistic and the z-statistic respectively. The deterministic cointegrating equation assumes a null hypothesis that the series are not cointegrated, using an automatic lags specification based on Schwarz criterion (maxlag = 12).

TABLE 4.4: Single – Equation Co-integration Analysis

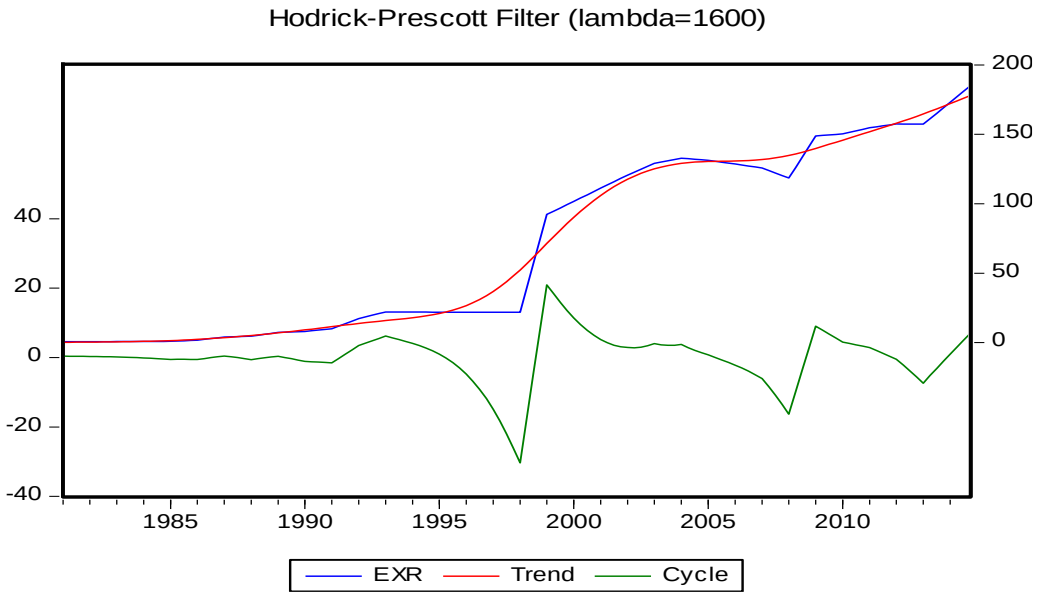
Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
OUTPUT	-2.758182	0.9591	-44.40269	0.0124**
TOP	-3.915084	0.5712	-56.08489	0.0108**
TOT	-2.938538	0.9323	-164.8933	0.0000**
FOP	-5.755047	0.0210*	-68.20998	0.0009**
EXR	-3.872634	0.5928	-52.18261	0.0125**
INF	-5.134350	0.0939	69.48732	1.0000
LIR	-3.698475	0.6792	-700.6066	0.0001**

*MacKinnon (1996) p-values.

The result of Table 4.4 shows that tau-statistic dictated 1 co-integrating variable (FOP) at 5% significance level, while z-statistic indicated 4 co-integrating variables (OUTPUT, TOP, TOT, FOP, and LIR) at 1% significance level and 1 variable (LIR) at 1% significance level. The fact that the dependent variables (OUTPUT and EXR) for the objective 1 and 2 are integrated alongside the explanatory variables included in the model, it confirms the existence of long-run linear combination in the models. Thus, we adopted an Error Correction Model (ECM) in order to bring back the short-run integrated model back to long-run form. The long-run in the first model is further established with the Hodrick-Prescott Filter graph presented below, where output grows with time in the same direction.



Also, the Hodrick-Prescott Filter graph for the second model shows long-run with a more volatile exchange rate (see graph below).



There are at least three methods of estimating the error correction model. These include; Engle-Granger 2-step method, the Engle-Yoo, and the Johansen technique based on VAR. This study, however, chooses to use the Engle-Granger 2-step method. The choice of this method is based on the fact that it is easy to use and possesses some unique capabilities. It is able to estimate both the

short and long-term effects of the explanatory variables on the explained variable. Also, it is able to determine the speed at which the explained variable returns to equilibrium after a deviation has occurred. However, one of its major drawbacks is that it can estimate only up to two co-integrating relationship between variables (*r = 1)*, which is actually the case in this study. The results are presented in the next section.

Results of OUTPUT Growth and Exchange rate Volatility Models

The result of the estimated ECM model for objective 1 of this study shows that out of the six (6) included explanatory variables three (4) are statistically significant while two (2) variables excluding the intercept are statistically insignificant in explaining the variation in output growth in Nigeria. Also in the second model, three (4) variables out of five (5) explanatory variables, including the intercept indicated to be statistically significant at 5% and 1% levels of significance (table 4.5).

Dep.: Exchange rate Volatility Result (obj. 2)

Variable	Coef.	Std. Error	t-Statistic	Prob.
OUTPUTV	0.819540	0.046683	17.55532**	0.0000
FOP	0.140024	0.273737	3.511527**	0.0007
TOP	0.375844	0.190868	1.969132	0.0511
TOT	-0.000128	3.35E-05	-3.825110**	0.0002
ECM2(-1)	-0.207549	0.002223	-3.395377**	0.0009
C	-5.596365	1.979147	-2.827665**	0.0054

R-squared	= 0.956518
Adjusted R-squared	= 0.954832
F-statistic	= 567.5460
Prob (F-Stat)	= 0.000000
Durbin-Watson stat	= 2.019600

Note: ** indicates significance at 5% and 1% level.

Source: EViews 9.5 estimate

The result shows that the three financial globalization variables included in the model, the Financial Openness (FOP), Trade Openness (TOP) and Terms of Trade (TOT) exacts statistically significant influence on the aggregate economic performance of Nigeria. This implies that changes in the financial globalization indicators induce variation in output growth in Nigeria. The result indicates that financial openness negatively influences output growth while trade openness and terms of trade positively affect growth. Specifically, it shows that a point change in financial

openness will negatively induce 13% change in output growth in Nigeria other factors kept fixed. On the other hand, a point of change in trade openness and terms of trade will respectively increase output growth by 2.8 units point and 0.005% changes, other factors remaining constant.

This result confirmed the situation of a country with a high financial risk like Nigeria. In line with the two side-effects hypothesis of financial globalization, financial openness increases output volatility in the high-risk classes, while it decreases output volatility in the low-risk class (Hansen, 1999). As a policy implication, an increase in financial openness by one unit (i.e. an increase of the sum of a country's foreign assets and liabilities by the amount of its GDP) leads to a decrease in output growth of 13% in Nigeria with high financial risk. Unlike other Low-risk countries that experience an increase in output growth under the same scenario. The relationship among financial openness, trade openness, terms of trade and output growth is very robust as it is invulnerable to modifications to the operating definition of the variables, the sample size and the functional form of the model. This is also in line with the economic theory that states that when a country bears more financial risk than a certain threshold level, financial openness increases output volatility. In those countries, investors withdraw their capital in times of recessions and thereby deepen the recession, as is observed in Nigeria in the recent time. By contrast, countries which bear less financial risk attract new capital in times of recessions due to better profit prospects and as a result of the efficient allocation of capital. Therefore, one of the policy implications of the result is that it can serve as a guideline to Nigeria in a bid to (re)consider her financial integration.

Another variable that indicates to significantly affect output growth in Nigeria is the real official exchange rate (EXR). The result shows that an appreciation of the real exchange rate will positively influence output growth in the country. It indicates that a point change in the real exchange rate will increase output growth by 10%, other factors remaining constant. The current recession experiences of Nigeria have clearly confirmed this result. The Nigeria economy has experienced devaluation in the official exchange rate that met with negative output growth, implying a positive relationship between real exchange rate and output growth.

Furthermore, the monetary policy quality proxy by the absolute value of inflation (INF), though has the right sign, but is not statistically significant to change in output growth. This is because the t-statistic value of -0.775 is not large enough, in absolute terms in rejecting the insignificant null hypothesis of the variable. The policy implication of this result is that, though the economy is faced with high inflationary trending, the declining change in output growth in Nigeria is not significantly influenced by high inflation rate but by other economic factors, such as the ones explained above. Another parameter included in the model that is well signed but has an insignificant influence in correcting the disequilibrium in output growth is the ECM parameter.

The result shows that the lag one error correction mechanism has an insignificant adjustment speed to the disequilibrium experienced by output growth variable. By implication, the model adjustment well without the major contribution of the ECM parameter.

The result of the second objective indicates that output volatility has a highly significant influence over financial volatility proxy in the model by exchange rate volatility. The result shows that a unit point change output volatility in Nigeria will increase financial volatility by 81% point change, other factors fixed. This is no small major confirmed the crucial relationship between exchange rate volatility and output volatility. However, the major point of the second objective is to examine the influence(s) of financial globalization on financial volatility in Nigeria. Therefore from the evidence shown by the result, out of the three major financial globalization indicators included in the model, two, financial openness and terms of trade (TOT) indicates to have a statistical and significant influence on the financial volatility. The trade openness variable has an insignificant influence over the changes in financial volatility in the Nigerian economy. The result shows that a point change in financial openness in the short-run will increase financial volatility (exchange rate volatility) by 14%, keeping other factors constant. This result once again confirmed the vulnerability of a country like Nigeria with high financial risk. Also, a point change in terms of trade variable will on the short-run decrease financial volatility by 0.0012% provided other factors are kept fixed.

The ECM parameter for the second model is well signed, having negative coefficient and being statistically significant. This implies that the disequilibrium in the model caused by time series structural imbalances was corrected back to equilibrium. The result indicates that 20% of the disequilibrium in the model in one year lag is corrected back to equilibrium. By implication, in Nigeria, it takes a financial instrument of exchange rate up to 5 years to fully adjust back to equilibrium state from a point distortion of the output volatility and financial globalization shocks.

In our final objective, we estimated the Pairwise Granger Causality relationships between financial globalization, output growth and exchange rate uncertainty using a Single Equation Englo-Granger approach. The estimation was conducted at lag 2. In the estimation, we included the three financial globalization variables used for our analysis, such as Financial Openness (FOP), Trade Openness (TOP) and Terms of Trade (TOT). Others are output growth (OUTPUT) and exchange rate uncertainty which is used in this context as a proxy for financial volatility.

CONCLUSION

With the discovery in this study that financial openness negatively influences output growth. The present study estimates financial globalization, output growth and financial uncertainty nexus in Nigeria. In measuring financial and output volatilities used for the estimations the study deviated from the usual ideas of using the standard deviation of the variable in question over a k-year window to the Band-Pass (BP) filter to detrend exchange rate. This study found that they is a positive interaction between financial volatility (exchange rate uncertainty) and output volatility in Nigeria. It shows that as financial volatility such as exchange rate uncertainty is increasing, output volatility will also be increased in the same direction. Backing this finding was a bidirectional causality relationship established to exist between financial uncertainty and output growth, with them granger causing each other. Also, the recent negative output growth in a time of economic recession has also highlighted the potential importance of heightened uncertainty during economic crises being a significant damper on output growth. The government and the monetary authorities should be more focused on the strengthening the exchange rate, since stable exchange rate improves the terms of trade, strengthen the local capacity and increases output growth. On a concluding note, addressing the heightened risks, including financial and operational risks due to economic recession as well as due to the market reforms themselves have remained the challenges of globalization in Nigeria.

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