

DECOMPOSITION OF CAPITAL INFLOWS AND CAPITAL MARKET DEVELOPMENT OF EMERGING ECONOMIES: EVIDENCE FROM NIGERIA

McRollins Efe Olotu and Orji Oliogu

Department of Economics, Novena University, Ogume

E-mail: efeolotu@gmail.com +2348037751767

Abstract

Right from the phenomenal integration of the Nigerian economy with the outside world, there has been remarkable surge of capital inflow in the form of foreign investment (direct and portfolio), overseas development assistance and bank loans. Recently, foreign portfolio investment appears to have taken the lead. Consequently, controversy had arisen regarding its impacts on the financial sector. While proponents project the view that the phenomenon exerts a positive influence on the total value of traded shares, critics have their reservation. This study examines the implications of foreign portfolio investment in the Nigerian capital market using the Error Correction Version of Ang and McKinnon Model owing to the existence of long-run relationship. From the result, contrary to expectation, trade openness is statistically different from zero with domestic investment and real interest following the trail. Interestingly, institutional quality, foreign portfolio investment and FDI proved significant in contributing meaningfully to Nigerian capital market development. Given the sector's prominent role in channeling resources for investment purposes, there is need to strengthen the on-going reforms in the financial sector. The government should also enact appropriate policies to boost foreign investor's confidence to attract more inflows in Nigeria.

Keywords: Capital inflows, foreign portfolio investment, capital market, total value traded

Introduction

All through the ages, the bedrock of economic thinking has been on how economies can grow. An area in which the search for such patterns goes unabated is in the investment arena which has recently been identified as a crucial engine of economic transformation. As Todaro (2004) opines, for investment to see an economy through the growth path, concerted commitment of the government and private sector is required to raise the savings rate, generate capital and provide an enabling environment where investment can thrive. That is to say, growth in emerging economies is a function of increased capital formation. However, there exist a huge gap between the required capital and the locally mobilized ones in developing countries. To bridge this gap, these countries have turned to the outside world to provide the required capital. This is where the capital market, markets dealing in longer-term financial contracts is indispensable. Although, institutional investors such as pension funds and insurance are active participants in the Nigerian capital market, others

such as foreign portfolio has become an increasingly significant source of fund for investment over the past three decades.

Impressively, since the internationalization of the Nigerian stock exchange, there has been increased capital flow into Nigeria in the form of foreign direct investment, foreign portfolio investment, overseas development assistance and bank loans (Olotu and Jegbefumwen, 2011). However, from the past two decades, foreign portfolio investment (which is simply investing in bonds and other securities in other countries) appears to have taken the centre stage such that by 2007, it has surpassed every other type of capital inflows into Nigeria with official flows (ODA) and bank loans declining in real terms (CBN, 2009). This has sparked off intense debates about the impacts of foreign capital on emerging markets. First, there is an emphasis on its positive impacts as adding new resources/capital to the host economy in a way that improves the efficiency of the financial sector and stimulating economic growth. From

the neoclassical perspective, growth is achieved by increasing the quantity of factors of production optimally such that in a simple world of two factors (labour and capital), since developing countries have more labour and less capital owing to shortage of domestic savings, capital inflows as orchestrated by O'Connor and Iscariot, (2010) become an important means of overcoming these problems of capital shortage. On the other hand, critics have expressed concern about the volatile nature of international capital flows as adversely affecting the financial sector of the economy (see, for example, Lebragacio, 2010).

Be that as it may, portfolio investment either in the form of venture capital, bonds or derivatives have a direct bearing on economic output through the injection of capital which spurs the development of the financial sector as more capital will be induced than is available domestically (Bordo and Meissner, 2007). This increase in capital will consequently lead to greater investment and a resultant enhancement of the financial sector. As Prasad, Rajan and Subramanian (2007) observe, openness of economies and free capital flows induce investors to deposit their funds where they can generate the highest rate of return, which prompts financial institutions to execute transaction on new and poorly developed. In other words, when a country exposes its financial and capital markets to foreign investment, more and cheaper capital from both domestic and foreign sources can be accessed. Moreover, investors can more easily diversify internationally and tailor their portfolio risks to their preferences.

In Nigeria, due to the heavy reliance on the external sector, successive administration over the years have thrown the borders open to the outside world. Thus, there have been increases in foreign portfolio investment (FPI) since 1986. During this period also total value of shares traded (TVT) witnessed massive acceleration (CBN, 2010). To what extent therefore can the development in the financial sector be attributable to expansion in foreign portfolio investment? That is not all. While these capital flows have been associated with high level performance of the financial sectors of some developing countries, others have experienced episodic collapses in their financial and capital markets over the same period. This leaves its effects, especially foreign portfolio investment inflow on the development of domestic capital markets of emerging economies nebulous and controversial thereby necessitating a compact and regular update. Besides the fact that much of the debate has been at the theoretical level with a pocket of empirical coverage, a large volume of capital inflow studies, emphasizing its decomposition is just a handful. This paper fills this gap, using the Nigerian data.

Methodology

To model the relationship between foreign portfolio investment and developments in the capital market in Nigeria this study follows that of Ang and McKibbin (2005 as cited in Lebragacio, 2010). Drawing inspiration from the Neo-classical syntheses and guided by the objective, a compact functional relationship is established thus:

$$\psi = f(\rho_1, \rho_2, \dots, \rho_n) \dots \dots \dots (1)$$

Where: ψ = Index of Independent Variable
 ρ = Vector of Explanatory Variables

Re-presenting equation (1) above to capture the variables employed for this analysis, we have:

$$CMD = f(OPN, ISQ, RIR, FDI, FPI, INV) \dots \dots \dots (2)$$

For equation (2) above to be made amenable to empirical computation, it transforms to

$$CMD_t = \alpha_0 + \alpha_1 OPN_t + \alpha_2 ISQ_t + \alpha_3 RIR + \alpha_4 FDI + \alpha_5 FPI_t + \alpha_6 INV_t + U_t \dots [3]$$

Where:

- CMD = Financial sector development proxied by TVT/RGDP
- OPN = Degree of Trade Openness calculated as X=M/RGDP
- ISQ = Institutional Quality (captured by government expenditure on security)
- RIR = Real Interest Rate (interest rate deflated to real term using the CPI)
- FDI = Foreign Direct Investment
- FPI = Foreign Portfolio Investment
- PDI = Private Domestic Investment

Estimation procedure

All the variables are assumed to be stationary. If they are not, the results emanating thereof may be spurious. Since most economic time series are affined to time so that their mean is time-dependent making them non-stationary, the first

step of our analyses will be to investigate the existence of unit roots using the Augmented Dickey-Fuller test (Pindyck and Rubinfeld, 1998). The ADF, designed to ascertain the order of integration is given by:

$$\Delta CMD_t = \alpha_o + \delta CMD_{t-1} + \beta_1 \sum_{i=1}^n \Delta CMD_{t=i} + \varepsilon_t \dots \dots \dots (4)$$

- Where:** Δ = First-difference Operator
 δ = Stationarity level

Where there is evidence of unit roots, the nuisance variable will be made stationary by entering it into the model according to their order of integration. Also, the log linear specification will be tried and the one that best suit out

specifications will be chosen based on goodness of fit and tolerable level of multi-collinearity. Thus the model may be transformed into its log form as follows:

$$\text{Ln}CMD_t = \alpha_0 + \alpha_1 \text{Ln}OPN_t + \dots \dots \dots + \alpha_6 \text{Ln}INV_t + V_t \dots \dots [5]$$

Again, there is a possibility of a long-run relationship among the variables. To detect this, we adopt the Engle-Granger procedure. Thus, if the dependent variable CMD has an identical order of integration with any of the explanatory variables, we estimate their linear combination and test their residuals for unit roots using the

ADF. If the T-statistic is less than the critical value then we reject the null hypothesis of non-cointegration. This implies the existence of a long-run relationship between the variables. Since co-integration is established, the model is estimated using the Error Correction Model given by:

$$\Delta CMD_t = \alpha_o + \alpha_1 \Delta OPN_t + \dots \dots \dots + \alpha_6 \Delta INV_{6t} + \beta_1 u_{t-1} + \varepsilon_t \dots (6)$$

- Where;** $\beta_1 u_{t-1}$ = Error Correction representation

u_{t-1} = Long-run separator of CMD from its explanatory variables

β_1 = Coefficient measuring the degree of error corrected

However, if co-integration is not established, we revert to estimating equation (3). But if equation (5) holds instead of equation (3), then equation (6) transforms to the equation below:

$$\ln \text{CMD}_t = \ln B_0 + B_1 \ln \Delta \text{OPN}_{t-1} + \dots + B_6 \Delta \ln \text{INV}_{t-1} + V_t \dots (7)$$

Finally, either the ECM in equation (6) or equation (7) will be estimated to determine the speed of adjustment of the disequilibrium between the long-run and the short-run dynamics.

Techniques for evaluation of result

The results of the model will be evaluated on the basis of three criteria namely economic criterion, statistical tests of significance, and econometric criterion respectively. First, the economic criterion will evaluate the parameters whether they meet the expected signs and/or known economic theory both in sign and magnitudes. Second, the statistical criterion will check the conformity of the estimates to a-priori expectation or otherwise. The coefficient of Determination R² will evaluate the variation in the dependent variable (CMD) caused by variations in the explanatory variables. Then the F-test and t-test will be employed to test for the overall and individual significance of the model, respectively. Finally, econometric criterion which is a diagnostic or secondary test will be conducted to further attest to the viability or otherwise of the statistical tests. These include:

Autocorrelation test

To detect the presence or otherwise of autocorrelation, we apply the rule of the thumb. When the DW-statistics is two or relatively close to two, there is no autocorrelation and vice-versa.

Model misspecification

Here, the Ramsey reset test is used. This follows the F-test such that if the F-observed exceeds its critical value, the model is well specified and the variable fit the model.

Residual normality test

The Jarque-Bera statistic will be employed. It follows the Chi-squared distribution given by:

$$\left[\frac{S^2}{6} + \frac{(K - 3)^2}{24} \right] \frac{n}{2} = JB$$

Where: S = Skewness Coefficient and K = Coefficient of Kurtosis.

For a normally distributed residual, the value of S and k are 0 and 3. Since the JB computed is expected to be zero with 2 degrees of freedom, the closer the value is to zero, the more normally distributed the residuals are and vice-versa.

The dataset

The data for this study are secondary in nature and were sourced from the CBN Statistical Bulletin and Statement of Account, various years. The variables for the study were sampled from 1980-2011 and were analyzed via OLS using the PC-Give 8.00 Econometric Package.

Presentation and discussion of results

Since results emanating from empirical models are likely to be spurious if the variables are non-stationary and co-integrated, to avoid this, necessary tests were completed prior to estimation. Following the ADF, unit roots test was run on the levels of the variables and on their 1st, 2nd and 3rd differences and the result displayed in the table below:

Table 1: Results of unit roots test

Variable	CMD	OPN	ISQ	RIR	FDI	FPI	INV
I ~ (d)	2	1	1	1	1	1	2

From the result, all the variables are stationary at first differences. That is, they are integrated of order 1, except the dependent variable and INV.

We thus implemented the Engle-Granger co-integration procedure by estimating the linear combination of INV against CMD in levels

without intercepts and tested their residual for unit root. The result is displayed below:

Table 2: Result of co-integration tests for the residuals

	t-ADF	Lag	Critical value
Residual 1	-3.0311	2	-1.952
Residual 2	-4.7005	1	“
Residual 3	-5.9093	0	“

From the table above, all the residual t-ADF exceed the critical value at the 5% level of significance. This confirms the existence of long-

Table 3: Results from modeling RGDP by ECM

	Variable	C	D	DI	D	D	D	DD	E
		O	S	RI	F	FP	IN	C	M
		P	Q	R	DI	I	V		
		N							
$R^2 = 0.6912$;	F (8, 23) = 73.28;								
	DW = 1.97								
From the table above, R^2 is 0.6912 implying that approximately 70% of the total variation in CMD has been explained by all the independent variables. The F-	Coef	0.42	-0.21	0.06	-0.01	0.23	0.31	0.26	0.41
statistic (73.28) exceeds its critical value (2.77) at 5% level of significance. The DW-statistics is 1.97 indicating the absence of auto-correlation. The coefficient of the ECM (0.4199) implies that at every interval, approximately 42% of the error is been corrected. In the same vein, the results of Jacque-Bera residual normality test indicates that with a relatively low JB statistic of 3.0112 and a high P valve of 0.61 the residuals are normally distributed.	t-values	0.07	-0.20	0.24	1.37	-0.12	-0.26	0.17	0.28
	F-	88	20	44	21	12	67	78	14
		56	17			50	31	1	02

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The result shows an astounding revelation. First, contrary to expectation, the degree of trade openness is not statistically different from zero judging from its t-value. That is not all. It possesses a negative coefficient of -0.22 showing an inverse relationship with capital market development such that a percentage increase in the degree of trade openness precipitates a deceleration in capital market development by 22%. This result is shocking because available literature projects the view that trade expansion in emerging economies exert positive significant influence on economic performance and by implication on the capital market. Although, the

run relationship thereby necessitating the adoption of an Error Correction Model to restore the variables to their long-run equilibrium.

coefficient of real interest rate (0.02) is not robust, the result meets the apriori expectation.

Since investors borrow extensively to finance investment which pays off at a lower interest rate, a percentage fall in the figure precipitates a 2% leap in investment which will translate to capital market development through series of interactions. However, the result is not

significant from its t-value. Another variable of interest is the level of domestic investment. It possesses a coefficient of 0.1261 implying that a percentage rise in the variable will prompt a 12% rise in capital market development. However, the result is not statistically different from zero judging from its t-value. Whether the economy has a limited absorptive capacity for resources utilization or the financial market is underdeveloped, we do not know.

As for institutional quality (ISQ), the variable is not only significant; it has the expected positive sign with a fragile coefficient of 0.06. When the rule of law and safety of lives and properties is tight, investment rises and vice-versa. Companies and financial institutions within and outside the domestic economy will be encouraged to execute transaction on new, poorly developed and non-liquid markets like the Nigerian capital market, ceteris paribus. This is because, investors are interested in depositing their funds in safe coffers where they can generate the highest rate of return. However, the result should be interpreted with caution as the proxy used for the study

(government expenditure on security) may not have been utilized in the desired direction due to corruption and other bureaucratic bottlenecks. Interestingly, from the result, foreign portfolio investment displays a positive coefficient of 0.41 indicating the existence of a positive relationship. This implies that a percentage increase in FPI will lead to 41% growth in capital market development. Coincidentally, FDI also has a robust positive relationship with capital market development.

Summary

The phenomenon of foreign portfolio investment has ignited controversy about its impact on capital market. While theoretical debate on the issue by proponents tends to project the view that foreign portfolio investment expansion in developing countries exerts a positive influence on the total value of traded shares and other development indices in the capital market, critics express concern about its volatile nature. The study therefore examines the role of foreign portfolio investment in capital market development in Nigeria using a variant of the Ang and McKinnon model using Nigerian data. To avoid spuriousness of the regression result, time series properties of non-stationary data were conducted and the Engle-Granger result reveals the presence of co-integration which justified the use of an Error Correction Model (ECM).

Conclusion

The result shows an astounding revelation. First, contrary to expectation, the degree of trade openness is not only statistically different from zero, it has an inverse relationship with capital market development. This result is shocking because available literature projects the view that trade expansion in emerging economies exert positive significant influence on the capital market. Following the same trail is aggregate domestic savings in the economy. It failed to pass the test of significance. Whether the economy has a limited absorptive capacity for resources utilization or the financial market is underdeveloped, we do not know. Also not statistically meaningful in the result is real interest rate. Of all the variables employed for the study, only institutional quality (ISQ), foreign

portfolio investment (FPI) and foreign direct investment (FDI) have shown up as the prime dictators of the status of the Nigerian capital market. They are not only significant they have the expected signs. However, while some possess fragile coefficients, others have robust coefficients.

Recommendation

Based on the results, there is need for the on-going reforms in the financial sector to be sustained given the fact that the sector has a prominent role to play in channeling resources for investment and productive purposes. Although the effect of real interest rate and institutional quality are negligible, caution should be exercised regarding the extent of changes to be made on them as experience has shown that certain policy intervention ends up exacerbating existing problems. Again government should put in place appropriate policies that will boost continuous inflow of foreign portfolio investment in Nigeria.

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