

Capital Account Liberalisation and Foreign Direct Investment in Nigeria: A Bound-Testing Approach

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Abstract

This study focuses on the neoclassical counter-revolution framework to investigate the relationship between capital account liberalisation and foreign direct investment in Nigeria for the periods 1980-2011. The technique of analysis employed is the Bound-Testing Approach. This technique, which was later re-parameterized to investigate the short-run dynamics, is primarily used to ascertain the long-run equilibrium condition among the variables. The results obtained largely supports the neoclassical counter-revolution framework which craves for government involvement in the natural workings of the economy to a minimal level; only for regulatory purposes. Thus, market-based measures towards FDI should be checked with legal/political measures; especially for capital control purposes. More so, the rate of inflation has alternate effect on FDI in Nigeria; implying that the effect of price level on FDI has not been consistent. On the whole, foreign direct investment in Nigeria is found to be driven by non-capital account liberalisation. In effect, the liberalisation of capital account transactions in Nigeria does not matter for FDI; either in the short-run or long-run situation. As such, government should focus on non-liberalising factors such as qualitative governance, price stability and institutional development in order to enhance foreign direct investment in Nigeria.

Key Words: Bound-Test, Capital Accounts, Foreign Investments, Neo-Classical.

JEL Classification Code: E22, F 32, F 23.

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1.0 INTRODUCTION

Essentially, the liberalisation of capital account transactions is predicated on the allocative efficiency hypothesis (as popularized by the neoclassical propositions pioneered by Solow; 1956) which presupposes that capital should be re-allocated from the capital-poor economies to capital-rich economies. Consequently, this is expected to cover the saving-investment gap of these capital-deficit countries and, thus, increases the global capital flow. However, the neoclassical model predicts a level-effect (temporary) increase and not scale-effect (permanent) increase in the growth rate of Gross Domestic Product (GDP) per capita for a capital-poor country that liberalises its capital account transactions. Testing for a permanent growth effect is not theoretically plausible because capital accumulation, which is subject to diminishing returns, is the only channel through which liberalization affects growth in the neoclassical model (Henry, 2007).

Besides, one of the key conclusions of the new literature is that the principal benefit of financial openness for developing economies may not be access to foreign capital that helps increase domestic investment by relaxing the constraint imposed by a low level of domestic saving. Rather, the main benefits may be indirect ones and of collateral effects such as the catalytic effects of foreign finance on domestic financial market development, enhanced discipline on macroeconomic policies, and improvements in corporate governance as well as other aspects of institutional quality (Obadan, 2006; Okogu and Osafo-Kwaako, 2006). It is in this wise that the IMF (1995) and World Bank (1997) raised a caveat for the liberalisation of capital account transactions in developing economies. Many studies; employing the neoclassical model, have considered the investigations between capital account liberalisation and economic growth (see Rodrik, 1998; Eichengreen, 2001; Edison, Klein, Ricci and Slok, 2004; Prasad, Rogoff, Wei and Kose, 2003). These empirical efforts are considered theoretically implausible because marginal returns to capital are considered diminishing and when not augmented with technological factors or human capital development, it is considered insufficient to generate economic growth (Romer, 2012). This remains the major void in empirical investigations on capital account liberalisation and economic growth. As such, this study fills the theoretical gap in empirical estimations as we seek to employ a modified Harrod-Domar framework – as opined by Skinner (2011) as the basis for the neoclassical counter-revolution hypothesis.

Although, there are few studies (Aizenman & Noy 2006; Aizenman and Noy, 2003; Noy and Vu, 2007; Asiedu & Lien, 2004) that directly investigate the relationship between capital account liberalisation and foreign direct investment. However, these studies were largely either of cross-country or involve firm-levels data, and thus, involve panel data structure. As we seek to cover the major gap of theoretical implausible framework predicated on some empirical studies (see Hsiao, 2003), the use of annualized data sets within a time-series trend are more merited than that of the panel data sets (Reisen and Fischer, 1993 and Mathieson and Rojas-Suarez, 1993; Henry, 2007 and Miller, 2004). Apart from this introductory section, this study is further divided into five other sections. Section 2 relates the conceptual issues around capital account liberalisation while section 3 captures the theoretical and empirical literature. Section 4 borders on the theoretical methodology and model specification with section 5 conducting the estimations and discussion of findings while section 6, being the last, concludes and provides policy suggestions.

2.0 LITERATURE REVIEW

Liberalisation of capital account transactions is well rooted in theoretical propositions. It is generally anchored on four theoretical strands such as the Neoclassical Global Efficiency Theory; the Dependency School; the Neoclassical Counterrevolution framework and the Keynesian Hypothesis. Beginning with, the neoclassical global efficiency theory predicts that capital mobility adds new resources, technology, management and competition to capital deficit economies in a way that improves efficiency and stimulates change in a positive direction. This theory presupposes that free flow of external capital should equilibrate and smoothens a country's consumption and production paths. However, the Dependence Model which was developed from Marxism has been reformulated to accommodate structural changes of the centre-periphery framework.

Nonetheless, the neoclassical counterrevolution framework indicates that market distortions must be removed and that the price mechanism must be efficient. It advocates a freely operating economic system with minimalist government intervention in the workings of the economy before liberalisation of capital account transactions can translate to foreign inflows of investment. The counter-revolution framework, as a refinement of the classical and neoclassical propositions, was part of a more general neoliberal reaction that was opposed to Keynesian, social democracy, state intervention and structuralism, not to mention radical theories like dependency. The story of this counterrevolution has been told by Toye (1987). For Toye, the counterrevolution in development economics began when University of Chicago economist, Harry Johnson (1923-1977) criticized Keynesian economics during the early 1970s. Johnson (1977) thought that intellectual movements in economics responded to perceived social needs rather than arising from an autonomous, purely scientific dynamics (Peet and Hartwick, 2009).

Essentially, the emphasis of the neoclassical counterrevolution in development policy was on the solution of three main problems claimed to impede development. Firstly, the problem of an over-extended public sectors; secondly, the problem of an over-emphasis on physical capital formation, and finally, the proliferation of distorting economic controls (Toye, 1987, pp. 48-49). The pioneer of this counter-revolution was Bauer (1972, 1984). Bauer (1984, p.6) attacked all forms of state investment. The first form is when the state intervenes in order to raise saving and investment and the second is when it intervenes because of lack of entrepreneurship. He argued that the requirement for entrepreneurship cannot justify state ownership because, if a society lacks entrepreneurs, there is no source from which the state sector can acquire them. Two objectives constitute the essence of the neoclassical counter-revolution. The first is pricism (to get the price right) through laissez-faire policies and the second is statism (reduce the scope of state intervention to a minimal requirement). The current literature merges the two, that is, free market with minimal state intervention (Jabbar, 2004). The neoclassical counter-revolution framework modifies and extends the neoclassical theory of growth by Solow and Swan (1956).

From an empirical standpoint, available literature on capital account liberalisation (CAL) and foreign direct investment (FDI) is largely hinged on cross-section, cross-country panel studies. Beginning with the Montiel and Reinhart (1999) study, most empirical literature employed the global efficiency framework. Other studies in this line are Alfaro et. al., (2005), Aizenman and Noy (2006) and Aizenman and Noy (2003) and these studies found that capital controls

have no impact on aggregate capital flow volumes. More so, the study of Noy and Vu (2007) suggests that FDI inflows are mainly determined by collateral effects such as institutional factors and macroeconomic measures as against capital account policies. However, Desai, Foley and James (2003); Boamah, Craigwell, Downes and Mitchell (2005); Kobrin (2004) and Sarode (2012) conducted independent studies and found positive correlations and strong significance level of capital liberalisation on investment levels. The study of Asiedu and Lien (2004) also found that, although, capital controls generally deter FDI, they still remain region-specific.

3.0 METHODOLOGY

This study is anchored on the neoclassical counterrevolution framework. This framework modifies the traditional Harrod Domar model. For this modification, Skinner (2011) posited that an infusion of foreign capital through liberalisation is equivalent to raising the savings rate which can be shown to increase GDP. This aligns with the propositions that foreign capital/investment is mainly sought to fill the savings cum investment gap in the domestic economy. A typical Harrod-Domar Model has five apriori assumptions viz;

$$Y = f(K); \text{ which denotes Output as a function of capital stock (1)}$$

$$\frac{dY}{dK} = c \Rightarrow \frac{dY}{dK} = \frac{Y}{K} \text{ (2)}$$

Equation (2) above implies marginal product of capital is constant; the production function exhibits constant return to scale. This implies capital's marginal and average products are equal.

$$f'(0) = 0; \text{ which suggests Capital is necessary for output..... (3)}$$

$$sY = S = I \text{ (4)}$$

Equation (4) implies that investment is a multiple of the savings rate and output.

$$\Delta K = I - \delta K \text{ (5)}$$

Equation (5) denotes the change in capital stock equals investment less depreciation of the capital stock.

These assumptions thus generate equal growth rates between the two variables. That is;

$$Y = cK \Rightarrow d \log(Y) = d \log(c) + d \log(K) \text{ (6)}$$

Since the marginal product of capital, c , is a constant, we have;

$$d \log(Y) = d \log(K) \Rightarrow \frac{dY}{Y} = \frac{dK}{K} \Rightarrow \dot{Y} = \dot{K} \text{ (7)}$$

Next, with assumptions (4) and (5), we can find capital's growth rate as;

$$\dot{K} = \frac{I}{K} - \delta = s \frac{Y}{K} - \delta \text{ (8)}$$

$$\Rightarrow \dot{Y} = sc - \delta \text{ (9)}$$

In summation, the savings rate multiply by the marginal product of capital minus the depreciation rate equals the output growth rate. Increasing savings rate, increasing the marginal product of capital, or decreasing the depreciation rate will increase the growth rate of output; these are the means to achieve growth in the Harrod Domar model. The model implies that economic growth depends on policies to increase investment, by increasing saving, and using that investment more efficiently through technological advances.

In modification, however, the Harrod (1936) and Domar (1945) assumption (precisely, the fourth assumption stated in equation 4 above) that the product of the savings rate and output equals saving equals investment (i.e. $sY = S = I$) can be re-stated as the product of added savings and foreign capital rates to output equals savings and foreign capital which then equals investment. That is;

$$(s + cf)Y = sY + cfY = I \dots\dots\dots (10)$$

This equation modifies the original Harrod-Domar model from a closed economy to an open economy through the infusion of foreign capital.

Following the derivation in the original Harrod-Domar model, we obtained a re-stated model of equations (8) and (9) as;

$$\dot{K} = \frac{I}{K} - \delta = (s + cf) \frac{Y}{K} - \delta \dots\dots\dots (11)$$

$$\Rightarrow Y = (sc + cfc) - \delta \dots\dots\dots (12)$$

Equation (12) show that the additions of the savings rate (s) multiplied by the marginal product of capital (c) and the foreign capital rate (cf) multiplied by the marginal product of capital (c) and less the depreciation rate equals the output growth rate. Given that the diminishing returns assumption of capital, in the neoclassical hypothesis, presupposes that only temporary effect of growth is realistic and, thus, validates the need for the neoclassical counterrevolution framework. The latter theory is hinged on individuality and only minimal government involvement for regulatory purposes can make price appropriate. It should further be noted that the modified Harrod-Domar model, stated in equation (12) above, which translates to an open economy model of the neoclassical counterrevolution framework suggests that there is in existence both the liberalisation effects of trade and capital (both market-based measures and legal/policy measures). It is these liberalisation effects that guarantee inflow of foreign capital. Putting all these together with equation (12) above being divided through by Y and foreign capital is made subject of the formular; we have behavioural equation of the form;

$$FDI = f(CAOPEN, KAOPEN, TOPEN, CPS_GDP, INFR, GOV_CONSUM) \dots\dots\dots 13$$

Where; FDI is Foreign Direct Investment, CAOPEN is the market-based capital account liberalisation measure, TOPEN is the measure of trade liberalisation, CPS_GDP is the credit to the private sector as a ratio of GDP, KAOPEN is the legal/policy index of capital account liberalisation. In the neoclassical counterrevolution equation above, “Liberalise” captures both capital accounts and current accounts liberalisation (otherwise known as trade liberalisation).

Besides, since the neoclassical counterrevolution hypothesis; which presupposes that all forms of government intervention could be seen as detrimental to the proper workings of the economy, validates the use of the ARDL Bond Tests as the most appropriate technique for this study; on the basis that the ARDL Bond test traces the time dimension of policy on the dynamics of the economy as evident in the CAL-FDI nexus, the above behavioural equation can be re-specified to further include the lagged dependent and independent variables. It becomes imperative to trace the time dimension of policy due to the lags evident along policy formulations; implementation and reaction/effect (see Anyanwu, Oyefusi, Oaikhenan and Dimowo, 1997). Stemming from the foregoing and in tandem with the neoclassical

counterrevolution framework, the appropriate ARDL formulation of our behavioural model specified above is compactly re-specified below thus:

ARDL formulation of our behavioural model specified above is compactly re-specified below thus:

$$\Delta FDI_t = \alpha_0 y_{t-1} + \sum_{j=1}^n \alpha_j \Delta FDI_{t-j} + \sum_{j=1}^n \mu_j \Delta CAOPEN_{t-j} + \sum_{j=1}^n \rho_j \Delta Z_{t-j} + \delta_1 FDI_{t-1} + \delta_2 CAOPEN_{t-1} + \delta_3 Z_{t-1} + \varepsilon_t \dots\dots\dots (14)$$

$$\Delta FDI_t = \alpha_0 y_{t-1} + \sum_{j=1}^n \alpha_j \Delta FDI_{t-j} + \sum_{j=1}^n \mu_j \Delta KAOPEN_{t-j} + \sum_{j=1}^n \rho_j \Delta Z_{t-j} + \delta_1 FDI_{t-1} + \delta_2 KAOPEN_{t-1} + \delta_3 Z_{t-1} + \varepsilon_t \dots\dots\dots (15)$$

Where;

Δ is the first differencing operator; y_{t-1} is the initial value of FDI; Z_{t-1} is the collection of other control variables (government size and the per capita GDP) directed towards making price right; ε_t is the white noise error term; Expanding the Z_{t-1} so as to include the specific as well as explanatory control variables; we have:

$$\Delta FDI_t = \alpha_0 y_{t-1} + \sum_{j=1}^n \alpha_j \Delta FDI_{t-j} + \sum_{j=1}^n \mu_j \Delta CAOPEN_{t-j} + \sum_{j=1}^n \rho_j \Delta Z_{t-j} + \delta_1 FDI_{t-1} + \delta_2 CAOPEN_{t-1} + \delta_3 TOPEN_{t-1} + \delta_4 INFR_{t-1} + \delta_5 CPS_GDP_{t-1} + \delta_6 OIL_EXPORT_{t-1} + \delta_7 GOV_CONSU_{t-1} + \dots\dots\dots (16)$$

$$\delta_8 INTR_{t-1} + \delta_8 ECHR_{t-1} \varepsilon_t$$

Where; CAOPEN – De-facto (market-based) measure of Capital Account Liberalisation (CAL); TOPEN – is Trade Openness which serves as the measure of Current Account Liberalisation; INFR – Inflation rate; it serves as the measure of price stability; CPS_GDP: It measures the level of financial development as well as the extent of financial deepening in the country. This is the ratio of credit to the private sector to the Gross Domestic Product (GDP); GOV_CONSU: This is a measure of government size – A way to capturing government involvement in the workings of the economy; OIL_EXPORT: This is the measure of natural resource endowment in Nigeria.

$$\Delta FDI_t = \alpha_0 y_{t-1} + \sum_{j=1}^n \alpha_j \Delta FDI_{t-j} + \sum_{j=1}^n \mu_j \Delta KAOPEN_{t-j} + \sum_{j=1}^n \rho_j \Delta Z_{t-j} + \delta_1 FDI_{t-1} + \delta_2 KAOPEN_{t-1} + \delta_3 TOPEN_{t-1} + \delta_4 INFR_{t-1} + \delta_5 CPS_GDP_{t-1} + \delta_6 OIL_EXPORT_{t-1} + \delta_7 GOV_CONSU_{t-1} + \dots\dots\dots (17)$$

$$\delta_8 INTR_{t-1} + \delta_8 ECHR_{t-1} \varepsilon_t$$

Where; KAOPEN – De-Jure (legal/policy) measure of Capital Account Liberalisation (CAL) and other variables are as previously defined.

The measurements of capital account liberalisation have been conducted under two forms in the literature. One form is the indirect way; through the dimension of capital control (indicated here as KAOPEN); otherwise known as de jure (or rule-based) index while the direct form, as a market-based measure, relates to de facto measure (see Kose, Prasad and Terrones; 2008). De jure index is the KAOPEN index developed by Chinn and Ito (2006; updated 2010) which is based on four (4) indicators such as multiple exchange rate, current account, surrender of export proceeds and five-year average of controls on capital transactions (see Kamar, undated; Asiedu and Lien, 2004). The KAOPEN index used in this study was sourced from <http://graduateinstitute.ch/md4stata/datasets.html>. De facto measure, as the ratio of foreign direct investment stock to Nominal GDP values, is the direct measure of capital account liberalisation. Both FDI Stock and Nominal GDP Values - (in US\$) were sourced from an online database: www.unctad.org/fdistat. The CAOPEN is positively related while

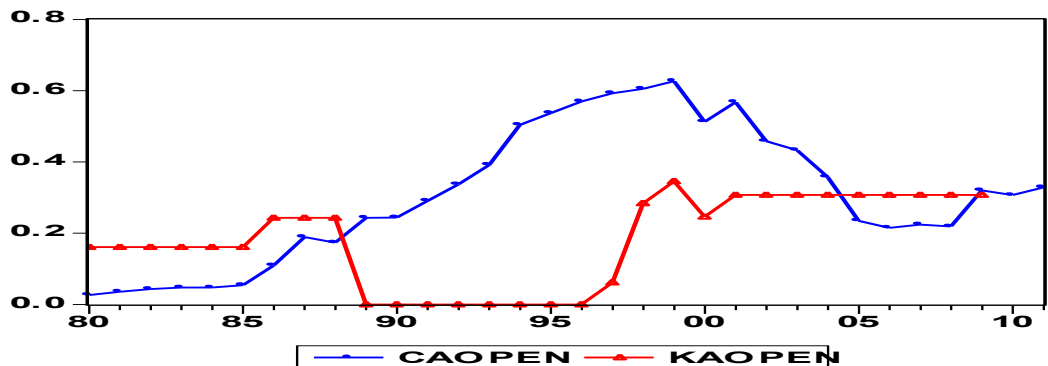
the KAOPEN is negatively related to FDI. In accordance with the modified Harrod-Domar framework (see Skinner, 2011), the TOPEN; which is trade or current account openness, is the precondition envisaged for capital account liberalisation, hence, positively related to FDI. In tandem with the neoclassical counter-revolution framework, INFR (as an indicator for price level in the economy) is the rate of inflation and it is expected to be positively related to FDI. CPS_GDP is the indicator for financial deepening and expected to be positively related to FDI while GOV_CONSUM, as a proportion of public spending, is an indicator for the level of government involvement in the economy. It is expected to be negatively related to FDI. According to Dunning (1976), natural resource endowment remains one of the attractions to foreigners in trading abroad. INTR denotes the rate of return on investment and as posited by the simple Keynesian framework, the rate of return determines the cost of capital which suggests to investors on where to domicile their 'money; EXCHR is the cost of foreign currency in Nigeria's Naira. It is taken as the rate of exchange of Naira to Dollar; Dollar being international reference currency. These data are sourced from the WDI (2012) and CBN Statistical Bulletin (2012).

4.0 ESTIMATIONS AND DISCUSSION OF FINDINGS

4.1 TRENDS OF CAPITAL OPENNESS AND CAPITAL RESTRICTIONS IN NIGERIA

The periods prior to 1995 indicates that Nigeria began with a relaxed capital control policy which was relatively improved upon with a coefficient of 0.16097 in 1980 to 0.2431 in 1998 but since 1989 up until 1995; she employed more stringent policies toward capital account transactions. However, the market-based agenda for capital openness shows a continuous increase trend from 1980 with 0.0264 ratios to 0.5373 in 1995. In effect, this implies that Nigeria embarked upon friendly market-based agenda but unstable capital control policies. However, the Post-1995 trend indicates Nigeria continued on a similar pattern of market-based capital openness agenda Pre-1995 period. It began with a ratio of 0.5698 in 1996 to 0.6266 in 1999 and thereafter decline continuously from a ratio of 0.5128 in the year 2000 to 0.3286 in 2011. This sharply contrasts with the legal/institutional policies towards capital control (as proxied by KAOPEN) with strict control in 1996 and continuous relaxation of these policies to a coefficient of 0.3077 in 2011. Stemming from the foregoing, it is observed that Nigeria has employed a good and an alternate mix of both legal/institutional policies with market-based agenda in her capital account liberalisation efforts for the periods under review. This behavior is rightly illustrated in Figure 1 below.

Figure 1: Capital Account Openness and Restrictions (KAOPEN) in Nigeria: 1980-2011



Source: Author

4.2 UNIT-ROOT ESTIMATIONS

The first step in any cointegration technique is to determine the degree of integration of each variable in the model (Bahmani-Oskooee and Nasir; 2009). Therefore, we conducted stationarity as well as unit-root tests to ascertain the time-series characteristics of the data. Also, we provide evidence valid for the justification of Autoregressive Distributed Lag (ARDL) Bound test as a cointegration technique. As posited by Pesaran et. al., (2001), ARDL Bound test is more suitable for variables at different order of integration while the Engle-Granger Cointegration technique is considered suitable for series with same or uniform integration order.

Table 1: Augmented Dickey Fuller (ADF) Test of Unit-Root

Variables	Augmented Dickey Fuller (ADF) Series		Ho: I(1)
	At Levels	At Order 1	Order of Integration
KAOPEN	-1.2780	-4.5851	I(1)
CAOPEN	-1.5102	-4.4567	I(1)
FDI	-4.0480	-	I(0)
TOPEN	-0.9463	-7.3598	I(1)
INFR	-2.9680	-7.3221	I(1)
OIL_EXPORT	-5.7148	-	I(0)
CPS_GDP	-1.7163	-4.6291	I(1)
GOV_CONSU	-3.8707	-	I(0)
EXCHR	-4.5693	-	I(0)
INTR	-3.0021	-	I(0)

Mackinnon Critical Values: 1%: -3.7076 10%: -2.6290 5%: -2.9798

Evidenced from Table 1 above shows that the test of stationarity is mixed among the variables to be included in our model. While five variables are without unit-root; that is, stationary at levels – I(0), the remaining five variables are integrated at an order one, I(1), before they could become stationary. Both measures of Capital Account Liberalisation; CAOPEN and KAOPEN, have to be differenced at order one before they could be stationary. Also, trade openness (proxied as TOPEN) which serves as the measure of current account liberalisation; along side with trade openness (otherwise known as current account liberalisation) which is proxied as TOPEN, inflation rate (proxied as INFR) and the ratio of credit to the private sector to the GDP (proxied as CPS_GDP) are also differenced at order one; I(1), before they could become stationary.

For the other series such as the measure of Foreign Direct Investment (FDI) – proxied as FDI – which is just the ratio of FDI to GDP coupled with the measures of government size (proxied as GOV_CONSUM); natural endowment (proxied as OIL_EXPORT), the foreign exchange rate (proxied as EXCHR) and the rate of return on capital invested (proxied as INTR), they could not be employed for analyses without resulting in spurious regression and, as such, were difference at order 1. The fact that those series differenced at an higher order, I(1), would be used under the same modeling framework with stationary series at levels lend credence to the use of the Autoregressive Distributed Lag (ARDL) model. As posited by Pesaran et. al., (2001), the Engle-Granger Cointegration is found suitable for series of the same differenced order while the ARDL model can be used to obtain the long-run equilibrium condition of variables irrespective of the differencing order.

4.3 GRANGER CAUSALITY ESTIMATES

We proceed further to ascertaining which of these variables Granger-causes the other. That is, from which of the variables do impact analyses flow from. We take to the Granger (1969) due to its simplicity and also because it is less costly in terms of degrees of freedom (Charemza and Deadman, 1997). In doing this also, we observe two lag periods as the maximum lag length adequate for the study; as informed by the optimum lag length selection criteria of Akaike and Schwarz. The data points employed for this study is annual time-series spanning 1980-2012.

Table 2: Granger Causality Results

Null Hypotheses*	Lag Period of 1		Lag Period of 2	
	F-statistic	Probability	F-statistics	Probability
FDI does not Granger cause CAOPEN	0.0018	0.97	0.4471	0.64
CAOPEN does not Granger cause FDI	0.2161	0.64	0.0792	0.92
KAOPEN does not Granger cause CAOPEN	39.091	2.E-08	1.8620	0.16
CAOPEN does not Granger cause KAOPEN	7.0801	0.009	0.7798	0.46
KAOPEN does not Granger cause FDI	0.9342	0.34	0.7292	0.48
FDI does not Granger cause KAOPEN	0.1156	0.73	0.5273	0.59

Source: E-Views Output. Note: The choice of lag 2 was optimally chosen by Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC)

We restrict our discussion of Granger causality test only to our main area of interest; which are the direction of impact between the legal/policy index of Capital Account Liberalisation (proxied as KAOPEN) and Foreign Direct Investment, on the one hand, and its counterpart indicator of market-based measure (proxied as CAOPEN). Under the null hypothesis of no causality; we do not reject the null hypothesis of no causal link from CAOPEN to FDI and vice versa; at both lag periods. Similarly, we do not reject absence of causal link from KAOPEN

to FDI at both lag periods. This suggests that Capital Account Liberalisation (CAL) does not granger causes Foreign Direct Investments (FDI) in Nigeria. However, the test shows that legal/policy index of Capital Account Liberalisation Granger causes the market-based measure of Capital Account Liberalisation at the 5 percent level of significance since the null hypothesis of no Granger causality is rejected with F-statistics ratio of 4.35 with 0.025 probability.

4.4 ARDL ESTIMATES

F-statistics for Testing the Existence of Long-Run Relationship

Table 3: CAOPEN AND FDI

Test Statistics	CAOPEN AND FDI	KAOPEN AND FDI
Computed F-statistics	1.96*	1.68*
Bound Testing Critical Values at 5%	Upper Bound: 4.01 Lower Bound: 2.86	Upper Bound: 4.01 Lower Bound: 2.86

Source: Pesaran et. al., (2001). * denotes accepting the null hypothesis of no cointegration at 5 percent level. The range of the critical values at 1 percent and 10 percent levels are 5.06; 3.76 and 3.52; 2.45 respectively.

The computed F-statistics ratio is obtained in the OLS estimates detailed in Table 3 above and then compared with the Bound Testing critical values at the 5 percent level of significance. The F-statistics ratios obtained are insignificant with coefficients of 1.96 and 1.68 for the market-based measure and the legal/policy index of capital account liberalisation. These are lesser than the lower bound critical value of 2.45; therefore, implying that the null hypothesis of no cointegration should not be rejected even at the 10 percent level of significance. This is so in that it is also lower than the 5 percent lower bound critical value of 2.86. The implication of these estimates is that market-based (i.e De-Facto) measure of Capital Account Liberalisation (proxied as CAOPEN) and Foreign Direct Investment (proxied as FDI) do not have equilibrium condition that could keep them together in the long-run situation. Similarly, the legal/policy-based (i.e De-Jure) index of Capital Account Liberalisation (proxied as KAOPEN) does not have equilibrium condition that could also keep it together in the long run with FDI in Nigeria. It implies that both capital account liberalisation and foreign direct investment are independent of each other in Nigeria. This further lend credence to the estimates obtained under the relationship between policy measures undertaken by the government towards liberalizing capital account transactions in stimulating FDI; which also showed independent relations.

4.5 RESULTS OF ESTIMATED LONG-RUN AND SHORT-RUN COEFFICIENTS USING THE ARDL APPROACH

4.5.1 ESTIMATIONS OF LONG-RUN COEFFICIENTS USING ARDL APPROACH

Table 4: ARDL Bound Test (Long Run) Estimates.

Model 1: Market-based Measure ARDL Optimal Ordering: (2, 2, 2, 1, 1, 0, 1, 0, 1, 1)				Model 2: Legal/Policy Index ARDL Optimal Ordering: (2, 2, 2, 1, 1, 0, 1, 0, 1, 1).		
Variable	Coefficient	T-Stat	Prob.	Coefficient	T-Stat.	Prob.
C	-10.994	-4.153	0.001	-12.029	-3.588	0.004
FDI(-1)	-0.368	-2.396	0.032	-0.237	-1.197	0.257
FDI(-2)	0.086	0.540	0.598	0.189	1.079	0.304
CAOPEN(-1)	14.100	3.166	0.007	-	-	-
CAOPEN(-2)	-15.093	-3.334	0.005	-	-	-
KAOPEN(-1)	-	-	-	-7.664	-1.839	0.093
KAOPEN(-2)	-	-	-	13.129	1.966	0.075
GOV_CONSUM	38.181	3.325	0.006	38.943	3.179	0.009
GOV_CONSUM(-1)	-20.930	-1.701	0.113	-6.040	-0.354	0.730
INFR	3.749	2.542	0.025	-0.238	-0.052	0.960
INFR(-1)	7.736	5.079	0.0002	-2.521	0.452	0.660
OIL_EXPORT	0.0844	1.966	0.071	-5.64E-05	-0.0009	0.999
INTR	-3.201	-2.173	0.049	0.758	0.165	0.872
INTR(-1)	-7.649	-4.996	0.0002	2.736	0.489	0.635
TOPEN	0.238	1.907	0.079	0.447	2.404	0.035
CPS_GDP	-0.227	-2.844	0.014	-0.077	-0.780	0.452
CPS_GDP(-1)	-0.434	4.578	0.0005	0.140	0.780	0.452
EXCHR	-0.028	-1.403	0.184	-0.049	-1.921	0.081
EXCHR(-1)	-0.004	-0.236	0.817	-0.0006	0.026	0.979
R ²	0.898			0.88		
Adj. R ²	0.772			0.707		
DW Stat.	1.82			2.74		
F-statistic ratio	7.122			5.083		
Prob.(F-statistics)	0.000473			0.00467		

Source: E-Views Output; **Note:** FDI is the Dependent Variable for both Models. The optimal ARDL ordering is conditioned on the empirical result that does not violate any decision criteria threshold and relatively produce improved empirical outcomes.

The coefficients of long-run impacts for both the market-based measures and legal/policy index are as detailed in Table 4 above. Essentially, the estimates indicate that liberalisation on capital account transactions appear to be time-dependent. The one-period lag effect of market-based measure is significantly positively related to foreign direct investment in Nigeria with 14.100 coefficient and 0.007 probability value while its two-period lagged effect is significantly

negatively related with -15.093 coefficient and 0.005 probability value. This suggests that capital account liberalisation is positively related to FDI in the immediate long-run but this could not be sustainable into the foreseeable future. In contrast, the contemporaneous effect of legal/policy index show significant negative effect of -7.664 coefficients with probability value of 0.093 for one-period lag but 13.129 coefficients with 0.075 probability values for the two-period lag. While the coefficients for the market-based measures are significant at the 5 percent level, those of the legal/policy index are significant at the 10 percent level. This supports the findings that legal/policy measures granger causes market-based measures in Nigeria and that both works in opposite directions. The implication of these estimates is that even though capital account liberalisation and foreign direct investment in Nigeria do not have equilibrium conditions that keep them together into the long-run situation, liberalisation of capital account transactions impact significantly on FDI in the long-run in Nigeria.

The level of price stability (as proxied by INFR) has positively affected foreign direct investment in Nigeria under a market-based measure of capital account liberalisation irrespective of the time-dimension (that is, either under the present or immediate past price level). The current rate of inflation has 3.749 coefficients with 0.025 probability values while the immediate past inflation rate has 7.736 coefficients with 0.0002 probability values. These sharply contrast with the coefficient of inflation rate under the legal/policy measures which are negatively related with -0.0238 and -2.521 coefficients for current and immediate past periods respectively. These are insignificant; not even at the 10 percent level with 0.960 and 0.660 probability values respectively. More so, government involvement in the economy (proxied as GOV_CONSUM) and trade (current account) liberalisation (proxied as TOPEN) are positively related to FDI; especially for the market-based measure. TOPEN has 0.238 coefficient and 0.079 probability value for market-based measure but 0.447 coefficient and 0.035 probability values. The former is significant at the 10 percent level while the latter at the 5 percent level. The implication is that the liberalisation of trade or current account transactions; like export and import, impact significantly on foreign direct investment in Nigeria; in the long-run situation.

On the other hand, the extent of natural resource endowment (proxied as OIL_EXPORT) is positively related to FDI with 0.0844 coefficient and probability value of 0.071 for the market-based measure but -5.64E-05 coefficient and 0.999 probability value for the contemporaneous values of legal/policy index. The level of financial deepening (proxied as CPS_GDP) in the Nigeria economy does not favour FDI either under market-based measure or legal/policy index but highly significant for the former. The CPS_GDP has -0.227 coefficient with 0.014 probability value for the immediate period and -0.434 coefficient with 0.0005 probability value for the past period under the market-based measure while under the legal/policy measures, the contemporaneous coefficients for immediate and past periods are -0.077 and 0.140 with 0.452 and 0.452 probability values respectively. The implication is that the extent of financial development in Nigeria has not been favourable to enhancing investment from foreign countries into the country. The same patterns of behaviors are evident for the relationship between exchange rates (proxied as EXCHR) and FDI, on the one hand, and, interest rate (proxied as INTR) and FDI, on the other hand. The interest rate as a measure of the rate of return on investment in Nigeria has -3.201 and -7.649 coefficients for immediate and past periods of market-based respectively coupled with 0.049 and 0.0002 probability values. In effect, the level of inflationary tendencies as well as price instability in the country has endangered foreign direct investment. Also, the extent of financial development and the rate of return on investment have not enhanced the attraction foreign investment into the country.

The adjusted R^2 obtained for both models 1 and 2 are 0.772 and 0.707 respectively. This shows that the variables included in the market-based model (i.e. Model 1) accounts for 77.2 percent movement in FDI while that included in the legal/policy index model (i.e. Model 2) explains for 70.7 percent movement in the FDI. The implication is that the models do not suffer from any misspecification error. Complementing this is the F-ratio statistics with 7.12 and 5.083 ratios for models 1 and 2 respectively. These are highly significant at the 5 percent levels of significance with 0.000473 and 0.00467 coefficients respectively; lending credence to the conclusion that the model has goodness of fit. More so, the Durbin Watson (DW) statistics of 1.82 and 2.74 statistics imply that the models are free from autocorrelation or serial correlation problem.

From empirical standpoints, the findings in this study support the results obtained in the studies of Montiel and Reinhart (1999); Alfaro et al. (2005), and Aizenman and Noy (2003) where they concluded that imposing capital controls had no impact on volumes of flows but did shift the composition of flows toward short term – ‘hot money’ – flows. Aizenman and Noy (2006), found that while capital controls have no impact on FDI gross flows, controls on the current account do have an indirect impact on FDI inflows through their impact on goods traded. More so, the findings in this study contradict that of Boamah, Craigwell, Downes and Mitchell (2005) study where they provided some evidence that capital flows are significant in explaining the movements in private investment boom in the region. Additionally, Somphornsem (undated) found that capital market liberalization makes the process of mergers and acquisitions easier, and increases alternative sources of capital for domestic companies. Foreign companies that invest in a liberalized country can acquire funds not only from their headquarters, but also from an IPO, or issue bonds which can create an incentive for foreign investors to enter the domestic markets. According to the above reasons, he posited, capital market liberalization should have a strong positive and significant effect on foreign direct investment. On the whole, this study produces findings as well as estimates that support the warning handed to developing economies by the IMF (1995) and World Bank (1997) that they should sequence their openness on capital account transactions as well as control some of these capital account items.

4.5.2 ESTIMATIONS OF SHORT-RUN COEFFICIENTS USING ARDL APPROACH

Table 5: ARDL-VECM (Short-Run) Estimates for Model 1: Market-based Model

Model 1: Market-based Measure			
ARDL Optimal Ordering: (1, 0, 0, 0, 0, 1, 0, 0, 1)			
Variable	Coefficient	T-Stat	Prob.
C	3.667	2.689	0.014
FDI(-1)	1.100	8.382	0.000
D(CAOPEN)	-9.428	-2.430	0.025
GOV_CONSUM	-12.248	-2.036	0.055
D(INFR)	-0.121	-1.696	0.105
OIL_EXPORT	-0.052	-3.082	0.006
INTR(-1)	-0.363	-5.015	0.0001
D(TOPEN)	-0.151	-1.612	0.123
D(CPS_GDP)	0.029	0.674	0.508
EXCHR(-1)	0.009	1.409	0.174
ECM(-1)	-0.960	-7.743	0.000
R ²	0.902		
Adj. R ²	0.853		
F-statistics ratio	18.35		
Prob. F-statistics ratio	0.000		
DW Statistics	1.67		

Source: E-Views Output; Note: FDI is the Dependent Variable.

Table 6: ARDL-VECM (Short-Run) Estimates for Model 2: Legal/Policy-based Model

Model 2: Legal/Policy-based Measure			
ARDL Optimal Ordering: (1, 0, 0, 0, 0, 0, 0, 0, 1)			
Variable	Coefficient	T-Stat	Prob.
C	-2.498	-2.939	0.009
FDI(-1)	0.503	4.390	0.0004
D(KAOPEN)	-10.558	-2.992	0.0078
GOV_CONSUM	11.771	1.925	0.0702
D(INFR)	3.137	1.522	0.145
OIL_EXPORT	-0.026	-1.093	0.289
INTR	-2.985	-1.456	0.163
D(TOPEN)	-0.00031	-0.0023	0.998
D(CPS_GDP)	0.083	1.313	0.206
EXCHR(-1)	0.0098	1.1058	0.283
ECM(-1)	-0.994	-6.568	0.000
R ²	0.863		
Adj. R ²	0.788		
F-statistics ratio	11.385		
Prob. F-statistics ratio	0.000		
DW Statistics	1.53		

Source: E-Views Output; Note: FDI is the Dependent Variable.

Tables 5 and 6 above detailed the Vector Error Correction Models (VECM) within the Autoregressive Distributed Lag (ARDL) framework for Models 1 and 2 respectively. These estimates are optimal as they were based on the optimal values of Akaike Information Criterion (AIC) selected amidst series of scenario analyses computed. For both Models 1 and 2, the ECM coefficients are properly signed with -0.960 and -0.994 coefficients respectively. These are highly significant too with absolute T-statistics values of 7.743 and 6.568 with probability values of 0.000 respectively. These estimates confirm the long-run equilibrium conditions evident among the variables of interest and further indicate that all disequilibrium conditions in FDI are barely recovered on a yearly basis to a tune of 96 percent and 99.4 percent for the market-based and legal/policy measures respectively.

Admittedly, liberalisation of the economy either of capital or trade are negatively related to foreign direct investment in Nigeria. Both the market-based and legal/policy measures are negatively significantly related to FDI in Nigeria with -9.428 and -10.558 coefficients with probability values of 0.025 and 0.0078 respectively. Trade liberalisation is negatively related to FDI with -0.151 and -0.00031 coefficients for both the market-based measures and legal/policy index respectively. These findings contradict the neoclassical counter-revolution framework but strongly support the dependency theory of capital account liberalisation. Also, the amount of natural resources endowment (as proxied by OIL_EXPORT) and the return on investment (proxied as INTR) are negatively related to FDI in Nigeria with -0.052, -0.363 and -0.026 and -2.985 respectively. Both the natural resource endowment and return on investment are significant for the market-based measure but insignificant for the legal/policy index of capital account liberalisation at the 5 percent levels of significance.

On the other hand, the level of financial development as proxied by CPS_GDP follows theoretical expectation of positive relation with 0.029 and 0.083 coefficients but insignificant with 0.508 and 0.206 probability values for Models 1 and 2 respectively. More so, the exchange rate is also directly related with 0.009 and 0.0098 coefficients with probability values of 0.174 and 0.283 for Models 1 and 2 respectively. More so, government involvement (as proxied by GOV_CONSUM) through the market-based measure is significantly negatively related to the foreign direct investment (FDI) with -12.248 coefficient and probability value of 0.055 while its involvement through the legal/policy measure is positively related to FDI with 11.771 coefficient and 0.0702 probability value. While the former is significant at the 5 percent level, the latter is significant at the 10 percent level. The adjusted R² obtained for both models 1 and 2 are 0.853 and 0.788 respectively. This show that the variables included in market-based model (i.e Model 1) accounts for 85.3 percent movement in FDI while that included in the legal/policy index model (i.e Model 2) explains for 78.8 percent movement in the FDI. The implication is that the model is properly specified and do not suffer from any specification error. Complementing this is the F-ratio statistics with 18.35 and 11.385 ratios for models 1 and 2 respectively. These are significant at the 5 percent levels of significance and further lend credence to the conclusion that the models are well fitted and of best fit. More so, the Durbin Watson (DW) statistics of 1.67 and 1.53 statistics imply that the models are free from autocorrelation or serial correlation problem.

4.6 DIAGNOSTIC AND ROBUSTNESS CHECKS

4.6.1 RESIDUAL TESTS

For robustness of results and the reliability of the estimates obtained, it becomes imperative that we conduct some tests on the estimates obtained. Essentially, four of these tests stand out.

These are the Ramsey RESET test (x_{RESET}^2); Jarque Bera test (x_{NORMAL}^2); Breusch-Godfrey LM test (x_{SERIAL}^2) and the ARCH (x_{ARCH}^2) tests. As detailed in the table 7 below, the estimates obtained for this study are robust since the diagnostic checks suggest that the model is devoid of specification bias and that the residual is normally distributed. More so, there is absence of serial correlation for the overall models 1 and 2 and no evidence of autoregressive conditional heteroscedasticity.

Table 7: Diagnostic Results

S/N	Test Statistics	Model 1: Market-based Measure	Model 2: Legal/Policy Index
1	x_{ARCH}^2	0.0194 (0.972)	0.1727 (0.842)
2	x_{SERIAL}^2	2.2271 (0.109)	1.2415 (0.3216)
3	x_{RESET}^2	1.4139 (0.316)	2.7514 (0.115)
4	x_{NORMAL}^2	0.0343 (0.7731)	1.4713 (0.512)

Source: E-Views Output. Note: Figures in parentheses are the probabilities of significance.

Specifically, the null hypotheses for these tests are that there is absence of autoregressive conditional heteroscedasticity – for the ARCH test; the residuals are serially uncorrelated – for the Breusch-Godfrey test; the model does not suffer from functional specification bias – for the Ramsey RESET test and that the residual is normally distributed – for the Jarque-Bera test. In line with these null hypotheses, these estimates suggest that these null hypotheses should all be accepted at the 5 percent of significance since the probability values for these tests are all above 0.05.

4.6.2 STABILITY TESTS

In order to completely ascertain the reliability level of our estimates, stability tests of CUSUM and the CUSUM sum of squared were conducted on the error correction estimates obtained. These tests are considered more apt than the Chow test as it depicts how the estimates depart or converge to their consistent level. As depicted in figures 2 and 3 below, the estimates lie within the confidence interval at the 5 percent level of significance; thus, lending credence to the stability of the model estimated.

Figure 2: Stability Test for Model 1: Market-based Model

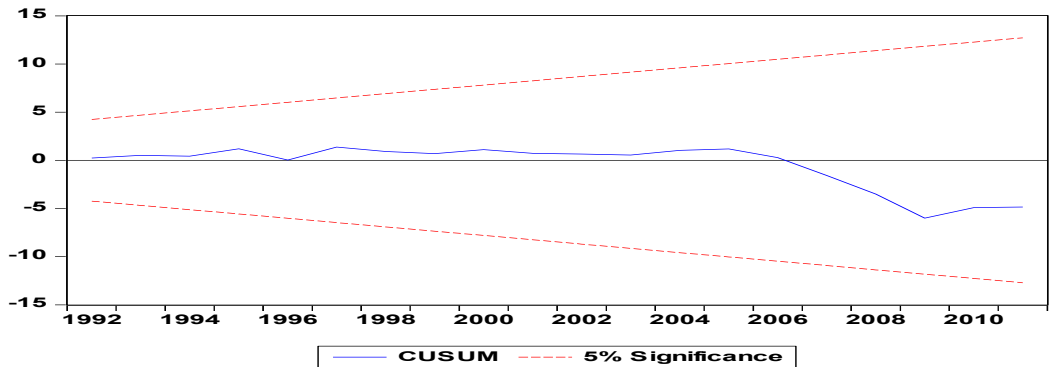
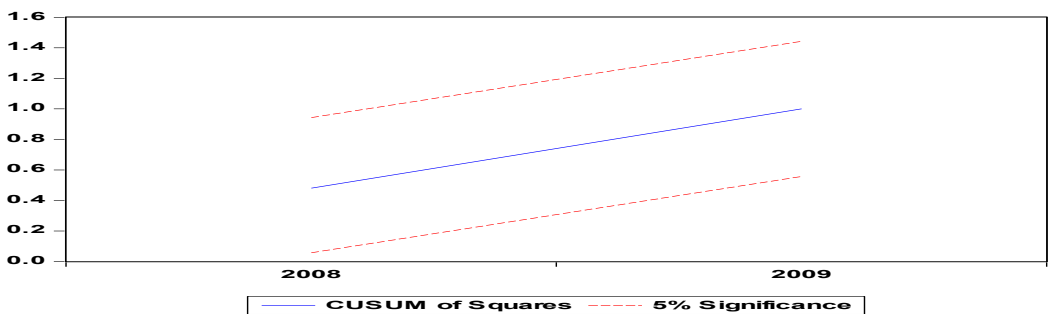


Figure 3: Stability Test for Model 2: Legal/Policy-based Model



5.0 CONCLUSION AND RECOMMENDATION

In conclusion, capital account liberalisation is found detrimental to foreign direct investment in the short-run and both could not equilibrium conditions that could keep them together into the long-run situation. Even though the long-run impact analyses suggest that capital account liberalisation is time-dependent, the result obtained still support the hypothesis that it is independent of the foreign direct investment. The involvement of government in the workings of the economy indicate that it is antithetical to foreign direct investment and should only be included at minimal level for regulatory and policy guidelines. More so, the rate of inflation has alternate effect on FDI in Nigeria; suggesting price has been distortional; perhaps due to the involvement of government in the market – as proposed by the neoclassical counter-revolution theorists. On the whole, foreign direct investment in Nigeria is driven by non-capital account liberalisation factors but only liberalisation on current account (trade) transactions is effective for foreign direct investment in Nigeria. The policy implication is that non-liberalising factors such as qualitative governance, aggressive financial development, stability of prices and sound fiscal management should be promoted in order to stimulate foreign direct investment in Nigeria.

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