Foreign Portfolio Investment and Capital Formation in Nigeria

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Abstract

The study examined the effect of foreign portfolio Investment on capital formation in using time series data, econometric techniques like ADF Unit Root Test, Granger Causality test and ARDL Bound test were employed. Capital formation was modeled as the function of foreign equity investment and bond investment. The unit root test indicates that two variables are stationary at difference while the remaining is stationary at level. The Granger causality test result shows that there is no causal relationship between foreign portfolio investment and economic growth. The cointegration bound test, for long run relationship, indicated that there is long run relationship between foreign portfolio investment and economic growth at 1%, 5% and 10% levels of statistical significance. The error correction term (ECM-1) was significant with correct negative sign. The long-run regression of the ARDL model shows that the coefficient of the previous value of foreign equity investment is positive and statistically significant implying that the present value of foreign equity investment depends positively on its immediate past state. In other words, what drives the present value of capital formation into the country is its value. The coefficients of bond investment and gross fixed capital formation are positive and statistically significant implying that increase in bond investment increases gross fixed capital formation. From the findings, the study concludes significant relationship between foreign portfolio investment and capital formation in Nigeria. The study therefore recommends that the need for government to continue attracting foreign bond investment as it stimulates the capital formation channel towards enhancing output growth. The financial sector most especially the apex bank, should ensure proper mobilization of investible fund in the economy through high saving deposit rates and accessibility of such fund by private investors through low lending rate. Government should create a conducive environment for foreign equity investment to come in. Over the years the federal government has been emphasizing that it would make the economy conducive for foreign investment to come in. But the environment has not been so inviting for investment because of high taxes and inconsistent policies.

Keywords: Foreign Portfolio Investment, Foreign Equity Investment, Foreign Bond Investment, Gross Fixed Capital Formation

INTRODUCTION

Capital formation is a word used to characterize a country's net capital accumulation over a given accounting (Van Oordt, 2017). However, capital is described as the process that enhances the acquisition of additional capital stocks which are used in the production of goods and services in an entity (Seth, 2021).Bakare (2011) described capital formation as the ratio of income saved from the present stream of income that can be freely invested to provide for income and output in the future. It often stems from acquiring assets such as factory buildings, machineries, equipment and other capital goods need for production. Capital formation is important for achieving long term or short term economic growth, rapid or persistent growth. However, capital formation is the process of adding to the stock of real productivity (Black, 2003). Capital formation can be achieved through capital accumulation and can also be referred to as capital accumulation (Olamide, 2018). Capital accumulation is a process which involves saving, borrows from accumulated savings for investment purposes.

Capital plays an important role in the development process (Solow, 1956; Agosin& Mayer, 2000, Misun & Tomsik, 2000). However, capital accumulation in developing countries is very low (Ahmad et al., 2018; Sucubasi et al., 2020). External sources of capital, such as foreign investment are preferable for developing countries as they lack capital (Apergis, Katrakilidis, and Tabakis, 2006; Ugwuegbe, Modebe& Edith, 2014). Foreign investment is an investment by a multinational enterprise that does business in at least one country other than its home country. Foreign investment come in the form of new investments, intercompany loans (loans from parent companies to subsidiaries), and reinvestment of profits in Foreign investment receiving countries. Compared to other types of capital flows, Foreign investment is considered more stable and less irreversible (Harms &Méon, 2018).

The rise in private investment inflows of Nigeria in 2011 (USD 6.8 b) till 2013 (USD 12.2b) were indeed, as a result of the removal of global financial barriers as well as improved economic growth (IMF 2013). Thus, private capital flows may either be driven by internal factors at some point in time and at other times domestic factors can also determine capital movements. Studies have attributed determinates of portfolio flows to two main factors. They are known as domestic and external factors. Fernandez-Arias (1996) noted that foreign capital to developing economies is usually influenced by push factors like; low international interest rates and the growth rate of industrialized nations. The pull factors are thought to influence the allocation of investors' portfolio to developing countries together with the motives of the investor (Dunning, 1993). For instance while natural-resource-seeking investors seek to benefit from the natural resource endowments of the host country, market-seeking investors' aim at exploiting the opportunities of new markets in host countries in terms of their size and/or growth. Taylor and Sarnio (1997) identified external and domestic factors to be of equal importance in explaining both equity and bond. The interest rate is however considered to be the most important variable in explaining short-run bond flows.

However speculative activities of huge portfolio investors like mutual funds, portfolio managers and market makers which could undermine local stock markets particularly in Nigeria. Although portfolio of Nigeria on the whole has improved, they are not evenly distributed. A good number

of studies have associated portfolio flows to domestic and external factors. Opinions however, differ in terms of the relative contribution of "push" factors arising from changes in industrial economies (Calvo, Leiderman, & Reinhart, 1996; Fernaindez-Arias, 1995; Byrne &Fiess, 2011) and "pull" factors as to the changes in developing countries (Hernandez and Rudolph 1994; The World Bank, 1997; Mody, Taylor, Felices & Orskaug, 2008). Others (e.g Taylor and Sarnio 1997 also find these factors to be of equal importance. Hence, it is unclear how external factors and domestic factors influence portfolio flows.

Furthermore, while studies on determinates of portfolio flows abound for America, Asia and Europe Calvo et al., 1994; Agarwal, 1997; Gordon & Gupta, 2003; Garg & Dua, 2014; Lucky & Uzah, 2016), the case is not necessarily so for Nigeria. Additionally, empirical literature, including studies on Sub Saharan Africa by Delechat et al. (2009) and BrafuInsaidoo and Biekpe (2013) concentrated on the pull factors of PI leaving no evidence for push factors. Although the study by Delechat et al. (2009) includes a wide range of pull factors, the Ordinary Least Squares (OLS) methodology is used. This may generate bias and inconsistent results if the regressors are endogenous. The Generalised Moment Method (GMM) which overcomes such problems will be employed for this study. This study provided a new contribution to the existing literature by focusing on the effect of foreign portfolio investment on capital formation in Nigeria.

LITERATURE REVIEW
Foreign Portfolio Investment
Portfolio investment usually involves the movement of capital across national borders and positions involving debt or equity securities, other than those included in direct investment or reserve assets (World Bank, 1993). World Bank (1993) defines portfolio flows to consist of bonds, equity (comprising direct stock market purchases and country funds) and money market instruments such as certificates of deposits and commercial papers. UNCTAD (1999) defines portfolio flow as a cross border transaction of financial assets in securities, a company's assets or through the financial market. Portfolio investment therefore includes the transfer of assets by way of investing in securities such as bonds, bank loans, stocks, derivatives and other forms of credit (e.g. pledges and trade). Investors are more interested in reaping the maximum return on their investment for a given level of risk and FPI normally have a shorter time horizon. Portfolio investment therefore tends to be volatile in nature. Whiles volatility may create opportunities for arbitrage profit and encourage market efficiency; it can also result to economic disturbance specially, in a boom or bust period.

Various approaches are used to examine the determinants of foreign portfolio investment (FPI). The portfolio is often divided into three categories, including country, industry, and firm levels. Most research focuses specifically on the country-level, specifically the relationship between exchange rates and foreign portfolio investment flows, including Garg&Dua (2014), Anggitawati&Ekaputra (2018), danCaporale et al. (2017), Gumus et al. (2013). Garg&Dua (2014), using a sample of India and the ARDL method, established that portfolio inflows were influenced by lower exchange rate volatility and appreciation, and greater risk diversification opportunities. Furthermore, it also disaggregates FPI into two, Foreign Institutional Investment flows (FII) and American / Global Depository Receipts (ADR / GDR). The FII determinants are similar to aggregate portfolio flows, while ADR / GDR is influenced by returns on domestic equity,

exchange rates, and domestic and foreign output growth. This is in line with Anggitawati&Ekaputra (2018)., which established a causal relationship between net foreign investment and the exchange rate in Indonesia using the VAR method.

The increase in FPI in form of domestic bonds often strengthens the local exchange rate. Domestic appreciation tends to increase FPI in the bond market. In the domestic stock market, there is only a one-way relationship, where only the domestic exchange rate has a significant impact on FPI movements on the Indonesian stock market. In this regard, the FPI on the stock market does not affect the domestic exchange rate. These results contravene Gumus et al. (2013), which established that FPI is only influenced by the industrial production index, rather than the exchange rate. The phenomenon of Foreign Portfolio Investment in emerging market economies has always attracted the attention of writers from the theoretical and empirical perspective. The benefits of foreign portfolio investment (FPI) include transfer of technology, higher productivity, higher incomes, more revenues for government through taxes, enhancement of balance of payment ability, employment generation, diversification of the industrial base and expansion, modernization and development of related industries.

According to Feldstein (2000) first, international flows of capital reduce the risk faced by owners of capital by allowing them to diversify their lending and investment. Second, the global integration of capital market can contribute to the spread of best practices in corporate governance, accounting rules and legal traditions. Proponents of foreign portfolio investment picture it as adding new resources/capital to the host economy in a way that improves efficiency and stimulates economic growth. It is thus viewed as a panacea for economic development by providing the capital underdeveloped countries desperately need to fill their savings-investment gap. From the neoclassical theory, growth is achieved by increasing the quantity of factors of production optimally. In a simple world of two factors, labour and capital, it is often presumed that low-income countries have abundant labour but scarce capital. This situation arises owing to shortage of domestic and investment savings in these countries (especially the developing countries), which places constraint on capital formation and hence growth.

Asia (2000) noted that foreign portfolio investment, strong and well-regulated financial markets are necessary to deal with the inherent volatility. The financial system must have the capacity to assess and manage risks if it is prudently and productively invest capital flows, foreign or domestic. Its central role of financial intermediation and credit allocation is a key element of economic growth and development. As has been shown above, foreign portfolio investment can be an important player in this function, and bring additional strengths and benefits, but those benefits will be most effective when working within a healthy financial system. For a financial market to maintain its health Osiegbu and Onuorah (2011), stated that institution within it must be able to identify, monitor and manage business risks efficiently. The payment system, through financial institutions and clearing houses, must be efficient and reliable. The financial system must also have the ability to withstand economic shocks, such as a substantial shift in the exchange or interest rates, or a sudden capital withdrawal. It must, as well be able to withstand systemic shocks, is a central, and perhaps unique, element of capital market. It demands adequate capitalization and risk management capabilities.

Capital Formation

Capital formation is defined as the process of building investable assets of value, the increase in wealth or the creation of further wealth. Capital formation is not savings though savings may be a process of capital accumulation because accumulation deals with the increase in stock of real investments and not all savings are necessarily invested. The increase in investment through non-financial assets has been held to increase value to the economy and the increase in the gross domestic product through further increase in employment (Adekunle & Aderemi 2012; Lucky & Uzah, 2016). The Central Bank of Nigeria (2007) defines capital formation as the total change in the value of fixed assets in the economy in addition to fixed assets either for replacing or adding to the stocks, it refers to the increase in the fixed capital stocks of the capital formed.

Capital formation is a complex process of channeling domestic generated or externally mobilized resources into private use. The intensity and the growth of capital formation is driven financial intermediaries as well as the institutional, political and social environment of the country. The relationship between financial intermediation and capital formation has been thoroughly analyzed in the theoretical and empirical literature. The conventional wisdom of the classical economists about these links is that monetary financial intermediation is a major determinant of long-term economic growth, which in turn is related to the conjecture that in the long run there must exist an expected positive return on the capital formation (Ahmed & Miller, 2000).

Theoretical Reviews

The Push Factor Theory

This theory explains the cause of FPI to external factors other than what happens in the domestic country. Among the push factors, a prominent role has been attributed to slow economic growth rate and low interest rate of industrialized countries (Calvo and Reinhart, 1998). Additionally, the increasing appetite of investors towards international diversification may also push capital flows into emerging economies (Calvo et al., 1996). Empirically, scholars such as Calvo et al. (1993) and Fernandez-Arias (1994) attributed the increase in capital inflows of developing countries in the 1990's to the decline in the US interest rate. Another key push factor identified by these authors is the rise in the tax rate of multinational corporations. While there are considerable numbers of literature which explain capital flows to emerging countries to be induced by a recession in industrialized countries, a contrast view has been provided once for developed countries.

Jeanneau and Micu (2002) indicated that robust economic activities in industrialized countries are significant in explaining portfolio inflows of developing countries. Another set of domestic factors in literature are the contagion effect. Contagion has gained much attention in literature since the Asian crises in 1997-1999. It generally explains circumstances between groups of countries. Masson (1999) identified three transmission mechanisms of contagion. These are the monsoonal effect, the spillover effects and the shift or pure contagion.

The monsoonal effect (such as real interest rate of major developed countries) is believed to be factors that affect a number of countries simultaneously especially, countries in the same region or with similar economic conditions. The spillover affects generally results from trade and

financial channels. Trade channels include market competition and import price changes whiles financial channels results from PI. Hence, a loss of competitiveness for country "A" for instance may cause a currency depreciation of country "B", suppose both countries are linked by commercial operations. On the other hand a simultaneous crises resulting from any of the above factors, is referred to as the pure contagion or shift contagion (Masson, 1999 and Forbes and Rigobon, 2002). For instance, a change in investors' sentiments may yield reversal of funds and trigger financial crises.

Forbes and Rigobon (2002) and Kleimeier and Sander (2003) assessed the contagion factors provided by Masson (1999). They provided evidence that the first two of Masson's factors may be channels where external shocks are usually transmitted and that, only the third factor could be contagion. This theory has important implications for policy design toward sustainable portfolio inflows of SSA. For instance once it is established that lower interest rate leads to an increase in PI of developing countries, an increase in such rates may hinder the ability of these countries to sustain such inflows. This raises an important issue for policy makers in host countries as to whether the domestic response is likely to effectively consider the possibility of reversal.

The Pull factor Theory

The pull factor theory attributes the flow of capital to be as a result of the domestic fundamentals of the recipient country. These domestic factors include creditworthiness of a country, improvement in fiscal and monetary policies and neighbourhood externalities (interest rate and the price earnings ratio of the host country) (Calvo, et al, 1996). Haque, Mathieson and Sharma (1997) also identify an increase in domestic output and domestic money demand to be pull factors. Other domestic factors also include the performance of macroeconomic variables such as financial development, inflation, GDP growth rate, current account balance and gross domestic investment. Thus, to evaluate the level of sound economic policies and the sustainability of capital flows, investment environment, infrastructure as well as the quality of institutions are also included as key domestic factors. Many scholars (Chuhan et al, 1994 and Ul-Haque, Kamar, Mark & Mathiesan, 1996) have identified pull factors to be the main significant factors that explain capital inflows of emerging economies in the 1990s. The authors argue that financial liberalisation among other factors such as privatization of public enterprise and improvement in macroeconomic conditions have improved the credit worthiness of developing countries leading to international capital mobility. Basu and Srinivasan (2002) provided evidence from Africa that, well-structured economic reforms coupled with political and macroeconomic stability and natural resources have attracted foreign capital like foreign investment to these countries. Similarly Asiedu (2002) found that poor policy and restrictions in trade hinders capital flows to African countries. Asiedu (2002) considered these factors to be paramount in explaining the proportion of foreign capital inflows of African countries.

Empirical Review

Olukemi (2022) examined the links between foreign direct investment (FDI) and capital formation in Nigeria within the period of 1981-2020. The estimation approaches used are augmented Dickey Fuller test for stationarity level of our data sets and the autoregressive distributed lag (ARDL)

model for short- and long- run relationship between the FDI and capital formation. The unit root test result indicated that interest rate and inflation rate were stationary at levels while other variables - FDI, government expenditure, gross domestic product, exchange rate and capital formation were reported to be stationary at first difference. Using the autoregressive distributed lag model, it confirmed that there is a long-run relationship between FDI and capital formation in Nigeria. The results further show FDI has positive and significant impact on capital formation in Nigeria. Other factors that positively influenced capital formation are government expenditure, gross domestic product and interest rate. However, exchange rate and inflation rate have negative impact on private investment in Nigeria. The study suggests the need for government to continue attracting foreign investment as it stimulates the capital formation channel towards enhancing output growth that is capable of promoting poor. Also, the financial sector most especially the apex bank, should ensure proper mobilization of investible fund in the economy through high saving deposit rates and accessibility of such fund by private investors through low lending rate.

Lucky and Uzah (2016) examined factors that determine Nigerian capital formation. The objective was to test Jhingan's propositions for sources of capital formation in Nigeria. Time series data were sourced from Central Bank of Nigeria (CBN) Statistical Bulletin. Nigerian Gross Fixed Capital Formation (GFCG/GDP) was modeled as the function of Broad Supply (M2/GDP), Credit to Private Sector (CPS/GDP), Gross National Savings (GNS/GDP), Commercial Banks Lending Rate, Exchange Rate (EXR), Inflation Rate (INFR), External Debt (EXTD/GDP), Public Expenditure (PEX/GDP), Government Revenue (GR/GDP), Terms of trade (TT/GDP) and Operating Surplus (OPS/GDP). Cointegration Test, Augmented Dickey Fuller Unit Root Test, Granger Causality Test and Vector Error Correction Model were used to test the dynamic relationship between the variables. Findings proved that M2/GDP, GNS/GDP, EXR, EXTD/GDP, TT/GDP have negative and insignificant effect on capital formation while CPS/GDP, LR, INFR, PEX/GDP, GR/GDP and OPS/GDP have positive and insignificant effect. The model summary revealed 86.0% explained variation and f-statistics 12.38458 probability of 0.000004. The study concludes that the variables have significant impact on Nigerian Gross Fixed Capital Formation and confirm the Jhingan's proposition.

Ezo, Seid and Mesfin (2023) examined whether foreign direct investments are a blessing or a curse for capital accumulation in developing countries. Data were collected for 16 developing countries over the period 2005–2018. An Arellano-Bover/Blundell-Bond dynamic panel estimation method was adopted to analyze the physical capital accumulation effect of foreign direct investments. The analysis indicates that for every percentage increase in foreign direct investment inflows to developing countries, physical capital increases by 2.31 percent. In addition, random-effect panel estimation was implemented to analyze the effect of foreign direct investments on human capital. For a one-percent increase in foreign direct investments, human capital increases by 2.38 percent. The results of our regressions show that not only the volume but also the type of foreign direct investment matters for capital formation in developing countries. Specifically, foreign direct investments in the secondary sector have a statistically significant positive effect on both physical and human capital. By contrast, foreign direct investments in the primary and tertiary sectors have a negligible effect. Our analysis suggests that developing

countries would benefit from investing more resources in education and opening up their economies to attract foreign direct investments, particularly in the manufacturing sector.

Liu et al. (2014) found that FDI in China has a negative effect on human capital. A study by Wang and Zhuang (2021) found that between 1980 and 2014, FDI reduced school enrollment rates for both boys and girls in 80 developing countries, but it is statistically significant only for girls. It gives women access to formal employment that was previously not possible without a college education. Finally, based on data from nine African countries, Kaulihowa and Adjasi (2019) provided evidence that FDI has no significant impact on strengthening human capital in developing countries. The results of this study are consistent with those of Neumayer (2005), Wang (2011), Doytch, Thelen, and Mendoza (2014), Sun and He (2014), Zhuang (2016), and Bello, Othman, and KhairriShariffuddin (2017). They argued that FDI has beneficial and statistically significant effects on human capital, as it can support the utilization of skilled labor and economic growth. It is also inconsistent with the results of Liu et al. (2014), Mughal and Vechiu (2015), Fahinde et al. (2015), Saucedo, Ozuna, and Zamora (2020), Ibarra-Olivo(2021), and Wang and Zhuang (2021) argue that wageincreases create strong incentives for unskilled workersto delay or drop out of school. MNEs are primarily interestedin exploiting the low cost of unskilled labor, whichis abundant in developing countries. They have thereforeprovided a great deal of employment to all unskilledworkers, especially women with previously inaccessibleformal jobs.

According to panel integration and co-integrationtesting by Apergis, Katrakilidis, and Tabakis (2006),FDI inflows stimulated domestic capital formation in30 developing countries during the period 1992–2002. It is recognized that FDI affects capital formationin developing countries through many channels, suchas the provision of more advanced production technology,improved organizational and managerial skills,marketing expertise, and market access. In a studyusing Malaysian data from 1970 to 2009, Lean andTan (2011) found a complementary relationshipbetween FDI and local investment. Using the generalizedmethod of moments (GMM), Al-Sadig (2012)reported that FDI significantly increased capitalaccumulation in developing countries between 1970and 2000. It is noted that the availability of humancapital in the host country determines the effectivenessof FDI in low-income countries. The high availabilityof a well-educated labor force increases theefficiency of FDI in accumulating capital.

Soltanpanah and Kariml (2013) found that FDI leadsto knowledge transfer to local workers via educationand training, as well as new skills, information, and technology.Similar results were reported by Rath and Bal(2014) for India over the period 1978–2018 usingvector autoregressive (VAR) estimation. Ugwuegbe,Modebe, and Edith (2014), using ordinary least-squares(OLS) estimates, conclude that FDI has a significantlong-term positive effect on the accumulation of physicalcapital in Nigeria. Based on fixed effects generalizedleast squares (FEGLS), Polloni-Silva et al. (2021) havefound that FDI enhances human capital status in Brazil.This is because MNEs are paying their employeesbetter wages and allowing them to invest in the educationand health of their families.By contrast, Eregha (2012), based on a study of 10countries of the Economic Community of WestAfrican States (ECUWAS) from 1970 to 2008, arguesthat FDI has no positive effect on capital accumulation.The failure of developing countries to benefit fromtechnological spillovers has been pointed out as aresult of a lack of human capital and technical knowhow.On

the other hand, other scholars agree thatFDI has a negative impact on the accumulation ofphysical capital.

Fahinde et al. (2015) found that FDIhas a significant negative effect on physical capital formationin the economies of the West African Economicand Monetary Union (WAEMU). This is due to a weaktechnology transfer. MNEs do not hire local workersin positions where they can acquire knowledge.GMM results from Ahmad et al. (2018) in China,based on data collected in 30 provinces between2000 and 2014, also found that FDI had a negativeeffect on capital formation due to its polluting characteristics.Budang and Hakim (2020) also observednegative effects of FDI using fixed estimates for 36Asian countries from 1993 to 2016.There is some ambiguity about the generalization ofthe impact of total FDI on physical capital accumulation,although some argue that it is sector-specific. Despitethe fact that FDI has no overall effect on capital accumulationin Uganda, Ahmed et al. (2015) found that sector specific FDI has a crowding-out effect in the financial,construction, and agricultural sectors. However, FDIhas a crowding-in effect on the mining and wholesalesectors. FDI in the energy, transport, and manufacturingsectors has a positive but insignificant effect on capitalformation. Autoregressive distributed lag model (ARDL)estimation by Shah et al. (2020) shows that FDI in manufacturingand services boosts domestic investment inPakistan. On the other hand, analysis shows that FDI inthe primary sector industries does not have a significanteffect on capital formation. Soe (2020) analyzed paneldata for 15 regions in Myanmar from 2012 to 2017 andfound that the crowd-in effect of FDI was found in thenon-oil and gas sectors. This is a result of weak linkagesbetween FDI and domestic investment in the oil and gassector. Djokoto (2021) and Nyiwul and Koirala (2022)found conflicting results on the effect of agriculturalFDI on capital accumulation in developing countries.The former argues that FDI in agriculture has negative long-term effects, while the latter has positive effects ondomestic capital formation.Evidence from past studies shows the need to conduct an empirical investigation between foreign portfolio investment and capital formation as there are few studies conducted in developing countries including Nigeria.

METHODOLOGY

The study adopted ex-post facto research design to examine the relationship between foreign portfolio investment and capital formation in Nigeria. Data were sourced from Central Bank of Nigeria statistical Bulletin. The study adopted the Ordinary Least Square method and granger causality. The study models are specified below:

$$GFCF = f(FEI, BI) \tag{1}$$

Transforming equation 1 to econometrics models

$$GFCF = \alpha + \beta_1 \, FEI + \beta_2 \, BI + e_i \tag{2}$$

Where

GFCF = Gross fixed capital formation as percentage of gross domestic product

FEI = Foreign equity investment

BI = Bond investment

Ɛ= Error term

Data Analysis Procedure

The main tool of analysis is the Ordinary Least Squares (OLS) using the multiple regression method for a period of 27 years, annual data Statistical evaluation of the global utility of the analytical model, so as to determine the reliability of the results obtained, were carried out using the coefficient of correlation (r) of the regression, the coefficient of determination (r^2), the student t-test and F-test.

Stationarity (Unit Root) Tests

The study investigates the stationarity properties of the time series data using the Augmented Dickey Fuller (ADF) test. According to Nelson and Plosser (1982) and Chowdhury (1994) there exists a unit root in most macroeconomic time series. While dealing with time series, it is necessary to analyze whether the series are stationary or not. Since regression of non-stationary series on other non-stationary series leads to what is known as spurious or   nonsense regression causing inconsistency of parameter estimate.If a time series is non-stationary, we can study its behaviour only for the time period under consideration, and cannot generalize it to other time periods, and hence remain of little practical value if we intend to forecast (Gujarati, 2003). It should be noted that a time series is a set of observations on the values that a variable takes at different times (daily weekly, monthly quarterly, annually). Stationary test therefore checks for the stationarity of the variables used in the models. If stationary at level, then it is integrated of order zero i.e. 1(0). Thus, test for stationarity is also called test for integration. It is also called unit root test. Stationarity denotes the non-existence of unit root. We shall therefore subject all the variables to unit root test using the augmented Dickey Fuller (ADF) test specified in Gujarati (2004) as follows.

$$\Delta y_t = \beta_1 + \beta_2 + \delta y_{t-1} + \alpha i \sum_{i-1}^{m} \Delta y_{t-1} + Et \qquad (3)$$

Where:

Δy_t =   change time t

Δy_{t-1} =   the lagged value of the dependent variables

Σ_t =   white noise error term

If in the above $\delta = 0$, then we conclude that there is a unit root. Otherwise there is no unit root, meaning that it is stationary. The choice of lag will be determined by Akaike information criteria.

Co-integration Test (The Johansen' Test)

It has already been warned that the regression of a non-stationary time series on another non stationary time series may lead to a spurious regression. The important contribution of the concept

of unit root and co-integration is to find out if the regression residual are stationary. Thus, a test for co-integration enables us to avoid spurious regression situation. This study will employ the Johansen Multivariate Co-Integration Test to ascertain if there is the existence of a long run equilibrium relationship among time series variables.

Granger Causality Test

One of the objectives of this study is to investigate the causality between the independent and the dependent variables. Granger causality test according to Granger (1969) is used to examine direction of causality between two variables. Causality means the impact of one variable on another, in other-words; causality is when an independent variable causes changes in a dependent variable. The rationale for conducting this test is that it enables the researcher to know whether the independent variables can actually cause the variations in the dependent variable. Thus, Granger causality test helps in adequate specification of model.

In Granger causality test, the null hypothesis is: no causality between two variables. The null hypotheses is rejected if the probability of F* statistic given in the Granger causality result is less than 0.05. Therefore, in this study, we will carry out a granger causality between an independent variable financial deepening and the dependent variables economic development in Nigeria from 1987 – 2020.

The pair-wise granger causality test is mathematically expressed as:

$$Y_1 \pi_o + \sum_{i=1} x_1{}^y Y_{t-1} \sum_{i=1} \pi_1{}^x x_{t-1} + u_t \qquad (4)$$

and

$$x_t dp_o + \sum_{t=1} dp_1{}^y Yt - 1 \sum^n{}_{t=1} dp1{}^x x_{y-1} + V_1 \qquad (5)$$

Where x_t and y_t are the variables to be tested white u_t and v_t are the white noise disturbance terms. The null hypothesis, $\mu^1{}_y = dp^y{}_1 = 0$, for all I's is tested against the alternative hypothesis $\pi^1{}_x \neq 0$ and $dp^1{}_y \neq 0$. If the co-efficient of $\pi_1{}^x$ are statistically significant but that of *dply* are not, then x causes y. If the reverse is true then y causes x. however, where both co-efficient of $\pi_1{}^x$ and $dp^1{}_y$ are significant then causality is bi – directional.

RESULTS AND DISCUSSION

Table 1: Unit Root Test

Variable	ADF Statistic	Critical value @ 1%	Critical value @ 5%	Critical value @ 10%	Order of integration
GFCF	-0.237052	-3.886751	-3.052169	-2.666593	1(0)
FEI	-6.203959	-3.959148	-3.081002	-2.681330	1(I)
BI	-5.904464	-3.959148	-3.081002	-2.681330	1(I)

Source: Extract from E-view 9.0

From the unit root test in table 1, it can be seen that the order of integration conforms to that of the requirement of the ARDL model. Foreign equity and bond investment are integrated of order one, it means that these variables are stationary at first difference. While gross fixed capital formation isintegrated of order zero, $I(0)$, it means that these variables are stationary at level difference. As a result of these we proceed to test for co-integration test (ARDL bound test)

Table 2: Co-integration Test-ARDL Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	2.694603	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	15		Finite Sample: n=30	
		10%	2.915	3.695
		5%	3.538	4.428
		1%	5.155	6.265

Source: Extract from E-view 9.0

From table 2 the F-statistical $>$ critical upper bound in 10%, 5% and 1% significant levels, therefore there exist a long-run co-integration relationship among the variables and gross fixed capital formation.

Table 3: ARDL Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GFCF(-1)	-0.307232	0.134363	-2.286589	0.1495
FEI	0.123862	0.027541	4.497371	0.0461
FEI(-1)	0.101463	0.029099	3.486815	0.0733
FEI(-2)	-0.186622	0.030293	-6.160485	0.0254
FEI(-3)	-0.183656	0.038850	-4.727285	0.0420
FEI(-4)	-0.192684	0.043503	-4.429213	0.0474
BI	0.489492	0.123508	3.963238	0.0582
BI(-1)	0.298339	0.124316	2.399843	0.1385
BI(-2)	0.661575	0.082825	7.987583	0.0153
BI(-3)	0.091317	0.112256	0.813467	0.5014
BI(-4)	0.262223	0.113918	2.301860	0.1480
C	54.80572	6.281966	8.724294	0.0129
R-squared	0.999093	Mean dependent var		19.75857
Adjusted R-squared	0.994107	S.D. dependent var		6.772736
S.E. of regression	0.519924	Akaike info criterion		1.298108
Sum squared resid	0.540642	Schwarz criterion		1.845871
Log likelihood	2.913246	Hannan-Quinn criter.		1.247402
F-statistic	200.3573	Durbin-Watson stat		2.583487

Prob(F-statistic)	0.004976

Source: Extract from E-view 9.0

From the regression result in table 4, it can be seen that foreign equity investment has negative effect on gross fixed capital formation while bond investment have positive effect on gross fixed capital formation within the periods covered in this study. The adjusted *R*-square also has a 99.4% goodness of fit of all variables.

Table 4: ARDL Error Correction Regression
ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(FEI)	-0.086410	0.055805	-1.548444	0.1725
D(FEI(-1))	0.174026	0.073556	2.365893	0.0358
D(BI)	0.669870	0.164245	4.078476	0.0065
D(BI(-1))	0.325077	0.210043	1.547668	0.1727
D(BI(-2))	0.252704	0.167279	1.510670	0.1816
ECM(-1)*	-0.626391	0.155784	-4.020898	0.0070
R-squared	0.833367	Mean dependent var		0.803333
Adjusted R-squared	0.740793	S.D. dependent var		2.897900
S.E. of regression	1.475390	Akaike info criterion		3.904896
Sum squared resid	19.59097	Schwarz criterion		4.188116
Log likelihood	-23.28672	Hannan-Quinn criter.		3.901879
Durbin-Watson stat	2.552047			

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FEI	-0.482079	0.132857	-3.628547	0.0110
BI	1.386378	0.384590	3.604824	0.0113
C	36.06171	7.197682	5.010184	0.0024

EC = GFCF - (-0.4821*FEI + 1.3864*BI + 36.0617)

Source: Extract from E-view 9.0

Discussion of Findings

From table 4 above, the coefficient of the previous value of foreign equity investment is positive and statistically significant implying that the present value of foreign equity investment depends positively on its immediate past state. In other words, what drives the present value of capital formation into the country is its value.The coefficients of bond investment andgross fixed capital formation are positive and statistically significant implying that increase in bond investment increases gross fixed capital formation. This is in line with the a priori expectation suggesting that foreign capital investment in the host country complement domestic capital.The coefficient of error correction model (ECM (-1)) is (-0.626391) and is appropriately signed. This speed of adjustment suggests that about 62.6% of the previous period's disequilibrium in gross fixed capital formation value is corrected every year by the variables such as equity and bond investment. The implication

is that it will take about one year and two months for any disequilibrium in the gross fixed capital formation value to be corrected by independent variables. The coefficient of multiple determination is 0.740793, suggesting that about 74.0% of the variations in gross fixed capital formation is explained by the foreign portfolio investment variables in the model. This further shows a good explanatory power of the model. Olukemi (2022) positive and significant impact on capital formation in Nigeria, the findings of the study is in line with the findings of Ezo, Seid and Mesfin (2023) that not only the volume but also the type of foreign direct investment matters for capital formation in developing countries, the findings of Liu et al. (2014) that FDI in China has a negative effect on human capital, Wang and Zhuang (2021) Liu et al. (2014), Mughal and Vechiu (2015), Fahinde et al. (2015), Saucedo, Ozuna, and Zamora (2020), Ibarra-Olivo (2021), and Wang and Zhuang (2021) that wage increases create strong incentives for unskilled workers to delay or drop out of school.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the effect of foreign portfolio investment on capital formation in Nigeria using Auto-Regressive Distributed Lag (ARDL) model.The study adopted ex-post facto research design. Data were sourced from Central Bank of Nigeria statistical Bulletin. The study adopted the Ordinary Least Square method and granger causality. From the results presented in table 4, foreign equity investment have positive and significant effect while foreign bond investment have positive but no significant effect on gross fixed capital formation in Nigeria.

Recommendations

i.   The study suggests the need for government to continue attracting foreign bond investment as it stimulates the capital formation channel towards enhancing output growth. The financial sector most especially the apex bank, should ensure proper mobilization of investible fund in the economy through high saving deposit rates and accessibility of such fund by private investors through low lending rate.

ii. Government should create a conducive environment for foreign equity investment to come in. Over the years the federal government has been emphasizing that it would make the economy conducive for foreign investment to come in. But the environment has not been so inviting for investment because of high taxes and inconsistent policies.

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