International Journal of Innovative Finance and Economics Research 11(4):52-65, Oct.-Dec., 2023
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External Financing And Construction Sector Output In Nigeria

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ABSTRACT
The study examined the effect of external financing and construction sector output in Nigeria using time series data from 1986 to 2022. External financing which is the independent variable was disaggregated into external loan, foreign direct investment, foreign portfolio investment and remittances, while construction sector output was employed as the dependent variable. Related conceptual, theoretical and empirical literatures were reviewed. The study was based on portfolio theory of international capital flows. The study adopted *ex post facto* research design. Data were sourced from the statistical bulletin of the Central Bank of Nigeria 2022. The statistical tools employed in this study are unit root test, cointegration test and error correction mechanism. The study indicates that foreign direct investment and foreign portfolio investment have significant positive effect on construction sector output in Nigeria. The result also indicates that foreign loans and remittances have an significant effect on construction sector output in Nigeria. Based on the F-statistics value of 82.45797 which is statistically significant, the study concludes that external financing had a significant effect on construction sector output in Nigeria. The study recommends that government should create enabling and secure environment to attract foreign direct investment and foreign portfolio investment into the construction sector as they were external sources of finance that were found significant to have significant influence on the construction sector.
Keywords: External Financing and Construction Sector Output

INTRODUCTION

Academic and official policy discussions support the need for international financial flows from developed to developing countries to accentuate the international transfer of real resources in support of economic development and the elimination of poverty in low income countries. The need for foreign capital to supplement domestic resources is being felt by the developing economies, in view of the growing mismatch between their domestic capital stock and capital requirements. This is evidenced by the attention given to the drive for foreign capital especially in developing countries. Foreign capital inflow has been identified as an important vehicle for augmenting the supply of funds for domestic investment (Ejelonu & Okafor, 2022). African countries and other emerging economies need substantial inflow of capital to fill their savings and foreign exchange gaps, enhance capital accumulation and human capital development. Thus, the relative advantage(s) of foreign capital inflow as a productivity-enhancing package is now widely acknowledged especially since the recent financial crises. Increasingly, economic development literatures show that there is a robust link between foreign capital flow (FCF) and human capital development (Abur, 2020).

External financing are transmitted through foreign direct investment (FDI), foreign portfolio investment (FPI), drawdown on foreign reserves, foreign loans/credits and remittances (Obadan, 2011). Theoretical literatures have provided evidences of benefits of capital flows; ironically, empirical evidence had established that they are not randomly available globally (Aremu, 2003). Therefore, the thrust of

international development policy has continued to stress the importance of high and stable capital flows from developed to developing countries, although the central role in the process has shifted from emphasis on multilateral and bilateral official flows to private flows (Kregel, 2004). This emphasis on the net transfer of resources as represented by external capital inflows is essential to the development process. Since developing countries have little capacity to produce such investment goods and levels of income insufficient to produce the savings required to finance high rates of investment, the obvious solution seemed to be to replace deficient domestic savings with foreign savings in the form of capital inflows. The importance of external financing was reinforced by the "return to an old-fashioned way of looking at economic development" as requiring a burst of investment spending to produce a "take-off" defined as an "industrial revolution" in Rostow's theory of stages in economic development. This stage describe the interval during which the rate of investment increases in such a way that real output per capita rises and this initial increase carries with it radical changes in the techniques of production and the disposition of income flows which perpetuate the new scale of investment and perpetuate thereby the rising trend in per capita output. The question now is how does these inflows affect sectoral output in developing countries particularly Nigeria.

A general assumption is that international capital, flows from developed economies to capital-scarce developing economies. Any (out) flow in the opposite direction, is not only unusual but abnormal. It is most likely as a result of the investor's perception that capital is subjected to inordinate level of risk due to political unrest, devaluation, government policy distortions, hyperinflation, exchange rate misalignment, among others (Osu, 2019). Capital flight from emerging economies such as Nigeria, not only aggravates the shortage of resources for development; it indirectly leads to a decline in growth. Growth is impaired partly because potential investment fund has been diverted abroad. Sani, Samuel & Ome (2021) argued that capital flight result to net loss in investment, as it amounts to a diversion of domestic savings away from domestic real investment, thereby retarding the pace of economic growth. However, Ajayi and Oke (2012) listed the following; risk perception, exchange rate misalignment, financial sector constraints and repression, fiscal deficits, weak institutions, macroeconomic policy distortions, corruption and extraordinary access government funds, etc as determinants of capital flight in Nigeria. Attracting as well as retaining foreign resources requires formulation of a consistent and an appropriate mix of financial, monetary and trade policies. Large inflow of hot money which is a major causative factor of financial instability in many economies renews the argument of whether capital account liberalization without controls is beneficial or harmful to an economy. The preoccupation of most host nations concerning foreign direct and portfolio investment therefore should include effective utilization of the resources they receive and effective and appropriate management of the problems associated with the vulnerability to volatile capital flows (Kanu, 2015).

The construction sector comprises establishments primarily engaged in the construction of buildings or engineering projects (e.g., highways and utility systems). Establishments primarily engaged in the preparation of sites for new construction and establishments primarily engaged in subdividing land for sale as building sites also are included in this sector (Ameh & Odusami, 2010). The construction industry plays an important role in the economy, and the activities of the industry are also vital to the achievement of national socio-economic development goals of providing shelter, infrastructure and employment (Anaman & Osei-Amponsah, 2007). Park (2009) asserted that the construction industry generates one of the highest multiplier effects through its extensive backward and forward linkages with other sectors of the economy. Ofori (2011) noted the importance of construction in the national economy and attributed it to the high linkages with the rest of the economy. Given the recognized importance of the sector to economic development and growth, construction has been used extensively by policy makers as a tool, and changes to the portion of public spending going towards building activity has been a feature of various governments' fiscal policy measures. Indeed, the importance of the industry to economic growth, especially in the case of developing countries, where evidence suggests that the share of construction output to national output is highest and of greater importance (Ruddock & Lopes, 2006), continues to motivate research into the sector. Based on the foregoing, this study investigated the effect of external

financing (external loan, foreign direct investment, foreign portfolio investment and remittances) on construction sector output in Nigeria.

REVIEW OF RELATED LITERATURES

External Financing

Financing involves the transfer of funds in exchange for goods, services, or promises of future return (Olayiwola, Okodua & Osabuohien, 2014). They further asserted that there are two options to guarantee and achieve finance for growth. These are options of domestic resource mobilization and foreign capital inflow. Domestic resource mobilization entails the generation of savings from domestic sources and their allocation to productive investment involving public and private sectors (Culpeper, 2008). Foreign capital inflow could be in form of capital good, loans, Official Development Assistance which sometimes is on a concessionary terms. External financing which entails international capital flows are the influx of usable funds into a country from source(s) outside the country. They refer to capital inflows from one economy to another for the purpose of investment, trade or business. In most cases, the capital come from developed countries and is invested in emerging or "third-world" countries. Capital inflows are the movement into a country of capital resources for the purpose of investment, trade or business production (Chigbu, Ubah & Chigbu, 2015). It is a known phenomenon that less developed countries have abundant supply of labour while lack of physical capital stock holds back economic growth and development in less developed countries. Investment from international capital inflows therefore, generate economic growth which leads to a higher national income level. Less financially endowed countries need more financially endowed countries for survival, improvement in the welfare of its citizens and development of its wealth which can be achieved through international capital inflow. International Capital flows are transmitted through foreign direct investment (FDI), foreign portfolio investment (FPI), drawdown on foreign reserves, foreign loans and credits (Obadan, 2006).

External Loans

External loans is one of methods through which countries finance their deficits and carry out economic projects that are capable of increasing peoples' standard of living and promote sustainable economic development. It is an important resource needed to support sustainable economic growth (George-Anokwuru & Inimino, 2020). Wanjuki (2016) defined external loan as the total private and public foreign debt owed by a country. To Akujuobi (2012), external debt refers to unpaid portion of external resources acquired for developmental purposes and balance of payments support, which could not be repaid when they fell due. In other words, external debts are debts owed by a country to institutions of countries abroad, that is, the creditors are foreigners, which in case its servicing and repayment will mean a drainage of national resources in favour of those foreigners.

External debt refers to the portion of a country's debt that was borrowed from foreign lenders including commercial banks, governments or international financial institutions (Omodero & Alpheaus, 2019). These loans, including interest, must usually be paid in the currency in which the loan was made. In order to earn the needed currency, the borrowing country may sell and export goods to the lender's country. External debt is widely believed to enhance economic growth and development (Odubuasi, Uzoka & Anichebe, 2018). That is the basic reason why the debt is usually borrowed in the first place. Both developed and developing nations seek for external debt to boost their economic performance (Akhanolu, Babajide, Akinjare, Tolulope & Godswill, 2018).

External debt is a major source of public receipts. The accumulation of external debt should not signify slow economic growth. It is a country's inability to meet its debt obligation compounded by the lack of information on the nature, structure and magnitude of external debt (Matthew & Mordecai, 2016). Udeh, Ugwu and Onwuka (2016) opined that countries borrow for two broad categories; macroeconomic reasons to either finance higher investment or higher consumption and to circumvent hard budget constraint. This implies that an economy borrow to boost economic growth and alleviate poverty. He argued that when debt reaches a certain level, it becomes to have adverse effect, debt servicing becomes a huge burden and countries find themselves on the wrong side of the debt-laffer curve, with debt crowding

out investment and growth. The debt service burden has militated against Nigeria's rapid economic development and worsened the social problems (Monogbe, 2016).

Foreign Portfolio Investment

Foreign portfolio investment (FPI) is an aspect of international capital inflows that involves the transfer of financial assets: such as cash, stock or bonds across international borders in want of profit. It occurs when investors purchase controlling interest in foreign companies or buy securities or notes. Foreign portfolio investment comprise of debt and equity investments with financial derivatives recently included. Just as trade flows result from individuals and countries exploiting their own comparative advantage, so too, are capital flows the result of individuals and countries seeking to make themselves better off, by moving accumulated assets to wherever they are likely to be most productive (Ibrahim & Akinbobola, 2017). This type of investment has become an increasing significant part of the world economy over the past three decades and an important source of fund to support investment not only in developed but also developing countries.

Conducive business environment and a strong legal system have been identified as a major attraction for foreign investment. Irrespective of how vibrant a capital market may be, an unfriendly business environment and weak legal system would not attract foreign portfolio investment. Nigeria business environment has been marred by inconsistent power supply, insecurity, bad roads among others as well as weak and slow judicial process (Chigbu, Ubah & Chigbu, 2015). The Nigeria business environment is highly uncertain with inconsistencies in government policies and lack of transparency in government operations. These unfavorable conditions may have discouraged some foreign investors from investing in the capital and money market.

Remittances

Remittances are the portion of international migrant workers' earnings sent back from the country of employment to the country of origin, and play a central role in the economies of many labour-sending countries. Workers' remittances consist of goods or financial instruments transferred by migrants living and working abroad to residents of the home economies of the migrants. It is limited to transfer made by workers who have stayed in foreign countries for at least one year, while workers who are self-employed are excluded (IMF, 1999). According to Kihangire and Katarikawe (2008), remittance is defined as money sent home by migrants working abroad to their home countries. Similarly, remittance as been defined has a portion of migrant workers earnings sent to their countries of origin and this could be in cash or gifts (Chowdhury, 2016). Moreover, Ekwe and Inyiama (2014) maintains that remittance is limited to money sent by migrant workers who have been staying in a foreign country for more than a year to his/her household in his/her country of origin and this does not include migrants that are self-employed.

Construction Sector Output

The construction sector comprises establishments primarily engaged in the construction of buildings or engineering projects (e.g., highways and utility systems). Establishments primarily engaged in the preparation of sites for new construction and establishments primarily engaged in subdividing land for sale as building sites also are included in this sector (Ameh & Odusami, 2010). Typically, a large construction company may be engaged in activities ranging from general building and civil engineering to material manufacturing, property development, and trade specialization. Peripheral services such as material supply, plant hiring, and the newly emerging project management firms contribute to a complex industrial structure. The importance of the construction industry stems from its strong linkages with other sectors of the economy (Rameezdeen & Ramachandra, 2008). Bynoe (2009) affirmed that the construction sector is an important element of many countries' macroeconomic growth strategy.

The construction industry plays an important role in the economy, and the activities of the industry are also vital to the achievement of national socio-economic development goals of providing shelter, infrastructure and employment (Anaman & Osei-Amponsah, 2007). The role of construction in the national economy has been addressed by a number of researchers. According to Khan (2008), the construction sector and construction activities are considered to be one of the major sources of economic

growth, development and economic activities. Construction industries play an important role in the economic uplift and development of the country. The construction industry is also a prime source of employment generation offering job opportunities to millions of unskilled, semi-skilled and skilled work force. Park (2009) asserted that the construction industry generates one of the highest multiplier effects through its extensive backward and forward linkages with other sectors of the economy. Ofori (2011) noted the importance of construction in the national economy and attributed it to the high linkages with the rest of the economy. The construction industry is regarded as an essential and highly visible contributor to the process of growth (Field & Ofori, 2009). The World Bank, (2014) stated that the importance of the construction industry stems from its strong linkages with other sectors of the economy.

The construction industry is often seen as a driver of economic growth especially in developing countries. The industry can mobilize and effectively utilize local, human and material resources in the development and maintenance of housing and infrastructure to promote local employment and improve economic efficiency (Anaman & Osei-Amponsah, 2007). Ameh and Odusami (2010) posited that construction industry in Nigeria comprises a group of heterogeneous and fragmented firms and, within firms, there is often a great diversity of activities. No other industry has similar characteristics.

Given the recognized importance of the sector to economic development and growth, construction has been used extensively by policy makers as a tool, and changes to the portion of public spending going towards building activity has been a feature of various governments' fiscal policy measures. Indeed, the importance of the industry to economic growth, especially in the case of developing countries, where evidence suggests that the share of construction output to national output is highest and of greater importance (Ruddock & Lopes, 2006), continues to motivate research into the sector. Hosein and Lewis (2004) suggested that the importance of the industry in particular to a developing country, is due to its size, the fact that it provides investment goods, and the size of government involvement. Brathwaite (1982) as cited in Bynoe (2009) put forward that in Barbados, construction activity is important because of the role it plays in the investment process and because it can be used as an early indicator of economic trends.

Theoretical Framework

The study is anchored on portfolio theory of international capital flows. This theory developed by Michael B. Devereux and Makoto Saito in 2006, presented a model of international capital flows in which the existence of nominal bonds and the portfolio composition of net foreign assets is an essential element in facilitating capital flows between countries. Recent global imbalances and large gross external financial movements have raised interest in modeling the relationship between international financial market structure and capital flows. This study constructs a model in which the composition of national portfolios is an essential element in facilitating international capital flows. Each country chooses an optimal portfolio in the face of real and nominal risk. Current account deficits are financed by net capital flows which reflect differential movements in the holdings of gross external assets and liabilities. A country experiencing a current account deficit will be accumulating both gross external liabilities and gross external assets. Net capital flows generate movements in risk premiums such that the rate of return on a debtor country's gross liabilities is lower than the return on its gross assets. This ensures stability of the world wealth distribution. An attractive feature of the model is that portfolio shares, returns, and the wealth distribution can be characterized analytically.

National monetary policies make domestic and foreign currency denominated bonds differ in the degree to which they can hedge country specific consumption risk. This leads countries to have distinct composition of currency denominated bonds in their national portfolios. By adjusting their gross positions in each currency's bonds, countries can achieve an optimally hedged change in their net foreign assets (or their current account), thus facilitating international capital flows. Moreover, the risk characteristics of optimal portfolios ensures that current account movements are sustainable -net debtor countries pay lower rates of return on their gross liabilities than they receive on their gross assets. This ensures that the distribution of wealth across countries is stationary.

This theory is relevant to the study in that it lays emphasis on the essential element that facilitates capital flows between countries that is the composition of national portfolios. This implies that portfolio shares, returns, and the wealth distribution can be characterized analytically. Countries can adjust their gross position in these portfolios to achieve optimally hedged change in their current account thereby facilitating external capital inflows to enhance the output of the real sectors of the economy.

Empirical Review

Sule (2017) carried out a study on external financing and industrialization in Nigeria from 1985 to 2016. The study employed industrial output a proxy for Industrialization as the dependent variable while the explanatory variables are external loan, foreign direct investment, foreign portfolio investment, remittance, official development assistance and exchange rate. Johansen Cointegration Test and Error Correction Model were employed for data analysis. The study found that external loans, foreign portfolio investment, remittance, official development assistance have negative relationship with industrialization in Nigeria while foreign direct investment has significant positive relationship with industrial output. The study concludes that external financing have significant negative relationship with industrialization in Nigeria.

Ezeudu, Ariwa and Edeoga (2017) investigated the impact of external debt on construction industry with particular reference to some cement industry in Nigeria from 1999 to 2015. Real gross domestic product was employed as the dependent variables while external debt stock, debt service payment and official exchange rate were employed as the explanatory variables. The study adopted exploratory research design. Ordinary Least Square was the tool of analysis. The result shows that external debt stock had a positive and significant impact on cement industry activities, while external debt service payment had negative and significant impact on cement industry activities in Nigeria.

Ebekozien, Ugochukwu and Okoye (2015) carried out an analysis of the trends of foreign direct investment inflows in the Nigerian Construction Sector from 1989 to 2008. Data generated were analyzed using regression analysis, Duncan Multiple Range Test and Granger Test, Results revealed that there is poor flow (or an insignificant flow) of FDI into construction sector when compared to other sectors of the economy. The study also found that FDI is an important prerequisite and catalyst for sustainable growth and development in construction and also the level of infrastructural facilities available on ground is a prerequisite for attracting foreign direct investors. The study further found a positive correlation or significant relationship between FDI and the construction sector output.

Nwosa and Amassoma (2014) examined the causal nexus between capital inflows (foreign direct investment and foreign portfolio investment) and exchange rate in Nigeria from 1986 to 2011. Real exchange rate was employed as the dependent variable while foreign direct investment, foreign portfolio investment, trade openness and oil price were employed as the explanatory variables. The study employed both granger causality and error correction modeling techniques. The causality estimates showed no causal link between capital inflows (foreign direct investment and foreign portfolio investment) and exchange rate within this period. The long run regression estimate revealed that foreign direct investment had negative effect on exchange rate while portfolio investment had positive impact on exchange rate. However, the magnitude of the impact was very minute unlike the international oil price which had a strong negative effect on the exchange rate. The short run result was similar to the causality result, indicating that neither foreign direct investment nor foreign portfolio investment had significant impact on exchange rate.

Monogbe (2016) carried out a study on intergenerational effect of external debt on performance of the Nigeria economy from 1981 to 2014. Ordinary least square, Phillip Perron test, co-integration test, and granger causality test to investigate the direction of causality between the variable used in the process of research. Finding reveals that Multilateral creditors/debt, total money supply and bilateral creditor/ debt which are proxy for external debt has positive and significant relationship to economic growth which

suggests that using borrowed fund for infrastructural, production and manufacturing project will stimulate economic performance and hence promote economic growth in the economy.

Sani, Samuel and Ome (2021) carried out a study on foreign capital inflows and manufacturing sector growth in Nigeria from 1986 to 2019. The study utilized the manufacturing sector output as proxy for manufacturing sector growth which is the dependent variable while foreign direct investment, foreign portfolio investment and foreign aid were the independent variables. The study employed the Autoregressive Distributed Lag (ARDL) estimation technique. The study found that foreign direct investment, foreign aid and foreign portfolio investment had a significant positive impact on manufacturing sector output. The study concludes that foreign capital inflows have significant impact on manufacturing sector growth in Nigeria.

Nudu and Alhazizi (2021) carried out a study on the impact of remittances on industrial output in Pakistan from 1991 to 2019. The study adopted ex post facto research design. Remittance, exchange rate and interest rate were regressed against industrial output. Regression analysis was employed in analyzing the data. The result indicates that remittances and exchange rate have significant positive impact on industrial output. Interest rate was found to have insignificant impact on industrial output in Pakistan.

Sule (2019) examined the potential of external financing in spurring industrial growth in Nigeria. The study covered the period of 1985 to 2018. The study used industrial output as the dependent variable while external loans, foreign direct investment, remittances, gross fixed capital formation, industrial energy consumption and contract intensive money was employed as the explanatory variables. Autoregressive Distributive Lagged (ARDL) bound approach was employed as the estimation technique. The study found a positive relationship exists between external loan and industrial output while foreign direct investment and remittance have negative effect on industrial output. The study also found that gross fixed capital formation, industrial energy consumption and contract intensive money exerts positive influence on industrial growth. The study contends that public-private partnership, is necessary to spur the industrial sector activities with strong institutional setup.

Osu (2019) investigated the impact of external capital inflows on the manufacturing sector in Nigeria from 1980 to 2017. Manufacturing sector output was employed as the dependent variable while foreign direct investment, foreign portfolio investment and external debt were employed as the explanatory variables. Ordinary least square and granger causality test were employed in analyzing the data. The study found that foreign direct investment and foreign portfolio investment have significant negative impact on manufacturing sector output in Nigeria. The study also found that external debt has significant positive impact on manufacturing sector output in Nigeria. The study contends that the Nigerian government should display high transparency through its various agencies, and the central bank of Nigeria should overhaul the system to flush out corrupt officials who pocket external resources inflows with impunity and friendly macroeconomic environment should be created by the government in order to attract more and sustainable foreign capital inflows in the economy.

Chigbu, Ubah and Chigbu (2015) examined the impact of capital inflows on economic growth of developing economies of Nigeria, Ghana and India from 1986-2012. With the help of Johansen Co-integration, granger causality and OLS regression techniques, the relationship between capital inflows and economic growth in the selected economies were investigated. The findings revealed that capital inflows have significant impact on the economic growth of the three countries. In Nigeria and Ghana, foreign direct and portfolio investment as well as foreign borrowings, have significant and positive impact on economic growth. Workers' remittances significantly and positively relate to the economic growth of the three countries. The study showed that capital inflow is indispensable in closing the savings-investment gap required for economic growth of developing countries.

Ekwe and Inyiama (2014) carried out a study to empirically determine the extent to which foreign capital flows have impacted on the growth performance of the Nigeria economy from 1982–2012. Gross domestic product was employed as the dependent variable while foreign capital inflows, foreign capital outflow, openness of the economy, human capital development index and inflation rate were employed as the explanatory variables. The study employed multiple regression analysis method for the test of the

hypotheses. From the results of the analysis, it was discovered that Foreign Capital Inflows had a positive and significant effect on economic growth with GDP as its proxy. It indicated that foreign capital inflows exerted considerable influence as a key fiscal policy instrument of economic growth over the stated period. Also the Foreign Capital Outflow in the same vein had a positive and significant effect on the GDP, which is another indication that it exerted considerable influence as a key fiscal policy instrument of economic growth over the stated period. Furthermore, the Openness of the economy, which was another explanatory variables used to ascertain the growth performance of the economy, had a positive and significant effect on the GDP. On the other hand, the Human Capital Development had a negative and insignificant effect on the GDP. Finally, the inflation rate had a positive sign with GDP. It was however, statistically insignificant which points to the severity of the inflationary pressure brought to bear on the economy over the stated period.

Kanu (2015) investigated the impact of foreign capital inflows on the economic growth of Sub Saharan Africa (SSA), with emphasis on Nigeria, Ghana and South Africa from 1980 to 2010. Real gross domestic product was employed was the dependent variable while foreign direct investment, foreign portfolio investment, overseas development assistance, economic migrant's remittances, openness to foreign trade, labour force, exchange rate and inflation were employed as the explanatory variables. Multiple regression technique was employed in analyzing the data. The outcome of the study revealed that there is no significant long run relationship between foreign capital inflows and the level of economic growth in Nigeria and South Africa. It was only the lagged value of GDP (In the immediate past year), taken as an independent variable that was found to be positively significant. Other Inflow indicators that were hitherto significant in the short run, turned out to be insignificant in the long. The scenario was almost the same for Ghana except for FDI and the lagged value of GDP (in the immediate past year), taken as independent variable that were positively significant in the long run. It was also revealed that, there exist causality relationships between capital inflow indicators and economic growth in the aforementioned countries.

The major gap identified in the studies within the Nigerian context like Sule (2019) examined external financing in relation to industrial growth while Osu (2019) investigated external capital inflows in relation to manufacturing sector. Similarly, Sule (2017) examined external financing and industrialization in Nigeria while Chigbu, Ubah and Chigbu (2015), Ekwe and Inyiama (2014) and Kanu (2015) examined foreign capital inflows in relation to economic growth. These studies did not cover the effect of external financing on the construction sector of the Nigerian economy. Besides, there seems to be no 'holistic' empirical investigation that examined external financing options (external debt stock, foreign direct investment, foreign portfolio investment, and remittances) in relation to construction sector output in recent times, hence, the need for this study. Thus, the current study is hypothesized to investigate the empirical relationship between external financing and construction sector output in Nigeria.

METHODOLOGY

The study adopted *ex post facto* research design. The major advantages of conducting an *ex post facto* study are that they are secondary data which the researcher cannot manipulate its current state. The data for this research work are time series from 1986 to 2022 and were sourced from the statistical bulletin of the Central Bank of Nigeria 2022. The statistical tools employed in this study are unit root test, cointegration test and error correction mechanism. A model was formulated to measures the effect of external financing on construction sector output in Nigeria. The model is stated in functional form as:

CSO = f(EXDS, FDI, REM, FPI)

Where

CSO	=	Construction Sector Output
EXDS	=	External Debt
FDI	=	Foreign Direct Investment
REM	=	Remittances
FPI	=	Foreign Portfolio Investment

From functional form, the econometric form is stated thus:

$CSO = \beta o + \beta_1 EXDS + \beta_2 FDI + \beta_3 REM + \beta_4 FPI + \mu$ (1)

Where

βo = Intercept
β_1 = Coefficient of Parameter External Debt
β_2= Coefficient of Parameter Foreign Direct Investment
β_3 = Coefficient of Parameter Remittances
β_4 = Coefficient of Parameter Foreign Portfolio Investment
μ = Stochastic disturbances or error term

The equation was linearized as follows:

$LCSO = \beta o + \beta_1 LEXDS + \beta_2 LFDI + \beta_3 LREM + \beta_4 LFPI + \mu$ (1)

Where

LCSO = Log of Construction Sector Output
LEXDS= Log of External Debt
LFDI = Log of Foreign Direct Investment
LREM= Log of Remittances
LFPI = Log of Foreign Portfolio Investment

RESULTS

Unit Root Test

The first step involves testing the order of integration of the individual variables under consideration. Researchers have developed several procedures for the test of integration, but the most popular of them is the Augmented Dickey Fuller (ADF) test. The result is presented below.

Table 1: Result of the Unit Root Test for Stationarity

Variables	At First Difference 1(1)	Order of Integration	Alpha Value
External Debt (EXDS)	-5.662972	1(1)	0.0001
Foreign Direct Investment (FDI)	-4.154537	1(I)	0.0027
Remittance (REM)	-7.879545	1(I)	0.0000
Foreign Portfolio Investment (FPI)	-4.840869	1(I)	0.0004
Construction Sector Output (CSO)	-5.843556	1(I)	0.0000

Source: Researcher's Computations from E-View Version 9.0.

From the unit root table above, it was observed that all the variables (external debt stock, foreign direct investment, foreign portfolio investment, remittances and construction sector output) are integrated at 1st difference. Since the decision rule is to reject stationarity if ADF statistics is less than 5% critical value, and accept stationarity when ADF statistics is greater than 5% criteria value, the ADF absolute value of each of these variables is greater than the 5% critical value at their first difference but less than 5% critical value in their level form with the exception of agricultural sector output which assumed stationarity on second difference. Therefore, all the variables are all stationary. This implies that the most suitable estimation technique for the model is Error Correction Mechanism since all the variables used in these models were stationary at first difference.

Cointegration Test

Cointegration means that there is a correlationship among the variables. Cointegration test is done on the residual of the model. Since the unit root test shows that all the variables are stationary, we go further to carry out the cointegration test. The essence is to show whether the variables have a long term relationship or equilibrium among them. That is, the variables are cointegrated and will not produce a

spurious regression. Johansen cointegration test was applied and the result are presented in the table below.

Table 2 Johansen Multivariate Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.688770	105.1520	69.81889	0.0000
At most 1 *	0.627510	66.63368	47.85613	0.0004
At most 2 *	0.478517	34.04467	29.79707	0.0153
At most 3	0.246036	12.55910	15.49471	0.1320
At most 4	0.093504	3.239563	3.841466	0.0719

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.688770	38.51836	33.87687	0.0130
At most 1 *	0.627510	32.58900	27.58434	0.0104
At most 2 *	0.478517	21.48557	21.13162	0.0446
At most 3	0.246036	9.319542	14.26460	0.2605
At most 4	0.093504	3.239563	3.841466	0.0719

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: E-view 9.

Table 2 indicates that trace have only 3 cointegrating variables in the model while Maximum Eigenvalue indicated 3 cointegrating equation. Hence, the trace statistics and Eigenvalue statistics reveal that there is a long run relationship between the variables in model one. That is, the linear combination of these variables cancels out the stochastic trend in the series. This prevents the generation of spurious regression results. Hence, the implication of this result is a long run relationship between dependent and the explanatory variables used in the model.

Estimation Results

Table 3 ECM Estimate for External Financing and Construction Sector Output

Dependent Variable: LCSO

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.599368	0.865431	-3.003553	0.0053
LEXDS	0.144859	0.187199	0.773827	0.4451
LFDI	0.625031	0.103309	6.050091	0.0000
LREM	0.078188	0.145274	0.538214	0.5944
LFPI	0.791139	0.157884	5.010895	0.0000
ECM(-1)	-0.469432	0.121871	-2.321238	0.0271

R-squared	0.616628	Mean dependent var	5.653125
Adjusted R-squared	0.605511	S.D. dependent var	2.270902
S.E. of regression	0.698053	Akaike info criterion	2.250519
Sum squared resid	14.61832	Schwarz criterion	2.472711
Log likelihood	-34.38408	Hannan-Quinn criter.	2.327220
F-statistic	82.45797	Durbin-Watson stat	1.773267
Prob(F-statistic)	0.000000		

Source: E-View Version 9.0

The result in table 3 showed that external debt has coefficient value of 0.144859 with a t-statistics value of 0.773827 and a probability value of 0.4451 which is highly insignificant. This indicates that a unit increase in external debt brought about 0.144859 increase in construction sector output in Nigeria though it is statistically insignificant. Foreign direct investment has coefficient value of 0.625031 with a t-statistics value of 6.050091 and a probability value of 0.000 which is highly significant. This implies that a unit increase in foreign direct investment brought about 0.625031 increases in construction sector output in Nigeria within the period under review.

Remittances have coefficient value of 0.078188 with a t-statistics value of 0.538214 and probability value of 0.5944 which is statistically insignificant. This indicates that a unit increase in remittances brought about 0.078188 increases in construction sector output though it is statistically insignificant. Foreign portfolio investment has coefficient value of 0.791139 with a t-statistics value of 5.010895 and probability value of 0.0000 which is statistically significant. This indicates that a unit increase in foreign portfolio investment brought about 0.791139 increases in construction sector output within the period under review.

The coefficient of determination (R^2) value of 0.616628 with adjusted R^2 value of 0.605511 indicates that the explanatory power of the variables is relatively high. This implies that 60.6% of the variations in construction sector output in Nigeria are accounted by the variations in external debt, foreign direct investment, remittances and foreign portfolio investment. The F-statistic value of 82.45797 with f-probability value of 0.000000 indicates that external financing variables used in this study has significant effect on construction sector output in Nigeria all thing being equal. The Durbin Watson Statistic value of 1.773267 which can be approximated to 2 indicates that there is no autocorrelation in the model. Hence, the model can be used for realistic forecasts.

The ECM estimate in table 3 above reported a negative error correction term value of --0.469432 and it was also found to be statistically significant at 5% level. This suggests that the previous years would be corrected in the following year at an adjustment rate of 46.94%. Hence, there is convergence of the study variables (external debt, foreign direct investment, remittances and foreign portfolio investment) to long run relationship equilibrium relationship. On this premise, we conclude that the coefficients are significantly differently from zero signposting that external financing on the overall has high statistical significant effect on construction sector output in Nigeria on the short run.

Diagnostic Statistics

The reliability of the econometric models of estimation and data analysis was determined using Serial Correlation and Heteroskedascity were presented below.

Serial Correlation Test

Serial correlation investigates whether there is a correlation between one time period and another over time in the time series used for the analyses. The presence of correlation of time periods will lead to serial correlation which will have huge effect on the reliability of model estimation. It may lead to high significant value, inefficient estimation, exaggerated goodness of fit and false coefficient of regression sign (positive or negative). The presence of serial correlation is tested using the Breusch-Godfrey Serial Correlation LM Test. The null hypothesis is no presence of serial correlation.

Table 4: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	5.479215	Prob. F(2,28)	0.2198
Obs*R-squared	9.844983	Prob. Chi-Square(2)	0.1873

Source: E-view 9.0

Table 4 indicates F-statistic value of 5.479215 with probability value of 0.2198 which is greater than 0.05. This indicates that there is no serial correlation (of time series) in the model. This confirms that the nature of the relationship (negative or positive) as found in the estimation from the Error Correction Mechanism (ECM) is correct and true of the model characteristics. This implies that the result of the test of hypothesis from the ECM gives correct position of the effect of external financing on construction sector output in Nigeria.

Heteroskedasticity Test

Heteroskedasticity was also tested for the regression analysis. Presence of heteroskedasticity implies that the coefficients estimated from the regression analyses will be a biased one. Presence of heteroskedasticity means that there is an unequal error variance in the model from the data observations. The null hypothesis is that the residuals are homoscedastic and the alternate hypotheses are that the residuals are heteroscedastic.

Table 5: Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.731482	Prob. F(4,30)	0.1474
Obs*R-squared	9.343894	Prob. Chi-Square(4)	0.1531
Scaled explained SS	5.664603	Prob. Chi-Square(4)	0.2256

Source: E-view 9.0

Table 5 shows that the F-statistic of the Breusch-Pagan-Godfrey Heteroskedasticity testis 2.731482 with probability value of 0.1474. Since the probability value is greater than 0.05, we cannot reject the null hypothesis that the residuals are homoscedastic. Thus we conclude that there is no heteroscedastic in the model. This implies that the result obtained from the estimated model is not biased.

CONCLUSION

The results indicate that external financing has significant positive effect on construction sector output in Nigeria. This indicates that external debt, foreign direct investment, remittances and foreign portfolio investment enhances construction sector output in Nigeria. This agrees with the findings of Sule (2017) that external financing have significant relationship with industrialization in Nigeria. This collaborates the findings of Ekwe and Inyiama (2014) that foreign capital inflows had a positive and significant effect on economic growth. Based on the foregoing, the study concludes that external financing have significant effect on construction sector output in Nigeria. the study recommends that government should create enabling and secure environment to attract foreign direct investment and foreign portfolio investment into

the construction sector as they were external sources of finance that were found significant to have significant influence on the construction sector.

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