PULL AND PUSH FACTORS AS DETERMINANT OF FOREIGN PORTFOLIO INVESTMENT IN THE EMERGING MARKET

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Abstract

The study investigates the pull and push factors as determinants of foreign portfolio investment flows in the emerging market from 1986 to 2018. The study employs autoregressive distributed lag (ARDL) bound cointegration test and ARDL error correction model (ECM). This work is intended to explore the determinants of foreign portfolio investment (FPI) in Nigeria and compare the result explored by Kaur and Dhillon (2010) in India. The result revealed that of all the explanatory variables, only MCAP, DMINT, REER, USGS and USINFR have a positive effect on FPI while GDPGR, USGDPGR, USGS and USINFR are significant. From the result of the analysis, the study agrees with Kaur and Dhillon (2010) that the host country gross domestic product (GDP) growth rates and the United States of America (the U.S.A.) inflation rates are among the significant pull and push factors that determine FPI flows in the long run. Based on these findings, the study recommends that economic policymakers in the host country should be more committed to strengthening its economy by boosting its GDP in order to push foreign investors to the economy since the dwindling in economic growth, low rate of return and rise in inflation rates of the developed countries such as the U.S.A. could push foreign investors to the emerging markets.

Keywords: Foreign Portfolio Investment, Foreign Investment, Pull Factors, Push Factors

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1. INTRODUCTION

No economy is sufficient on its own. There is a need to complement domestic savings and investment with foreign investment to have a hedge among other countries of the world. A developing economy recognises the importance of foreign capital to supplement domestic resources because most developing countries are characterised by a low level of domestic savings, which has impeded the much-needed investment for economic development (Owo, 2013). A desirable level of investment that would ensure sustainable development can be attained when developing countries are able to mobilise foreign savings to bridge the savings-investment gap. The gap, when financed

through foreign savings comes in the form of capital flows. Capital flows are transmitted through foreign direct investment (FDI), foreign portfolio investment (FPI), the drawdown on foreign reserves, foreign loans and credits, etc. (Obadan, 2004). The foreign investment when it is on tangible assets is referred to as a direct foreign investment. It is called portfolio investment when it is on shares, bonds, securities, etc. (Bakare, 2011).

In the works of Fosu and Magnus (2006), it was revealed that foreign capital inflow is an important vehicle for augmenting the availability of funds for domestic investment. The advent of portfolio investment can supplement domestic saving for improving the investment rate in developing countries which are characterised as a scarce capital economy. By providing foreign exchange to the developing countries, FPI also reduces the pressure of the foreign exchange gap for the less developed countries (LDCs), thus making imports of necessary investment goods easy for them. With foreign investment in emerging markets, sufficient fund is made available for productive investment which contributes to the growth of the economy especially when utilized optimally.

Despite these benefits, there exist fluctuations in the flow of foreign private investment to the emerging markets over the years such as the Nigerian economy. This has, however, necessitated the need to identify those factors that can contribute to the inflow and outflow of foreign investment in Nigeria and examine their relative impact so that appropriate measures can be taken where necessary. Foreign private investment is divided into two, namely foreign direct investment and foreign portfolio investment but the focus of this study is on foreign portfolio investment. This is premised on the observation that there are many studies on the determinant of foreign direct investment in Nigeria which include Wafure and Nurudeen (2010), Ekpo (1997), Anyanwu (1998), Ndem, Okoronkwo, and Nwamuo, (2014), Oladipo (2013), Offiong and Atsu (2014), and Maghori (2014) to mention but a few, while there is a wide gap in the literature on determinants of foreign portfolio investment flows to Nigeria.

Moreover, many of the available works in Nigeria have concentrated on host country-specific factors (pull factors), namely domestic interest rate, degree of trade openness, exchange rate, market capitalisation, gross domestic product (GDP) growth rate with little or no consideration of home country (push factors), such as the U.S.A. interest rate, the U.S.A. inflation rate, the U.S.A. gross savings, the U.S.A. GDP growth rate. In view of the above, this study intends to fill the literature gap by investigating the determinants of foreign portfolio flows to Nigeria using both host country (pull) and home country (push) factors in order to broaden its scope for better decision making.

The rest of this paper is as follows. Section 2 reviews the relevant literature, Section 3 analyses the methodology that was employed to carry out empirical research on pull and push factors as determinant of foreign portfolio investment, Section 4 presents the analysis of the study, Section 5 discusses the findings while Section 6 reflects the conclusion, recommendations and limitations of the study.

2. LITERATURE REVIEW

2.1. Conceptual literature

2.1.1. Foreign portfolio investment

Foreign portfolio investment can be referred to as transactions across countries that involve the sale of securities (debt and equities), apart from those included in direct investment or reserve assets. It covers, but is not limited to, securities traded on organized or other financial markets. In the works of Baghebo and Apere (2014), FPI is defined as a part of international capital flows that entails transferring financial assets (cash, stock or bonds) across international borders with anticipation of profit. It also involves a means whereby investors purchase controlling interest in foreign companies or buy securities or notes. UNCTAD (1999) explains foreign portfolio investment as the transfer of financial assets by resident individuals, enterprises and institutions in form of investment in one country in securities of another country, either directly in the assets of the companies or indirectly through financial markets.

It can also be described as an investment in a foreign country where the foreign investing party does not seek control over the investment. It takes the form of the purchase of equity or government debt in a foreign stock market usually less than 10% of the total holding (Eniekezimene, 2013). A portfolio investment is made with the expectation of earning a return on it that is directly related to the risk expected from the investment. Portfolio investment differs from direct investment in several ways. Firstly, foreign direct investment involves taking a sizeable stake in a target company and having full involvement with its day-to-day management. Secondly, foreign portfolio investments are short-term by nature which makes them more sensitive to shocks and volatile unlike the foreign direct investment component with long-term characteristic nature to mention but a few (Oyejide, 2005). An array of factors could be responsible for the flows of foreign capital namely; the stability or otherwise of macroeconomic variables, insecurity, corruption and other socio-political factors.

2.1.2. Pull and push factors

The internal and country-specific economic force that pulls capital into a country and hence captures the relative attractiveness of different destinations for investment opportunities is referred to as pull factors. They include: trade openness, high domestic interest rates, high growth potential, increase in creditworthiness as a result of macro-economic stabilization, widespread liberalization of financial markets, and successful resolution of the debt problem and low domestic inflation. One of the critical pull factors that could be considered by any investor is the domestic interest rate on return compared with the investment risk. When the domestic interest rate on return is attractive, foreign investors will be pulled to invest in such an economy. Also, the high growth potential of GDP growth rate in emerging markets will cause foreign investors to withdraw their funds from the home country and get pulled to invest their resources in

the host country as confirmed by Onuorah and Akujobi (2013). Pull factors also provide information about the prevailing economic conditions in each country, such as macroeconomic stability and financial vulnerability which assist foreign investors in their decision making.

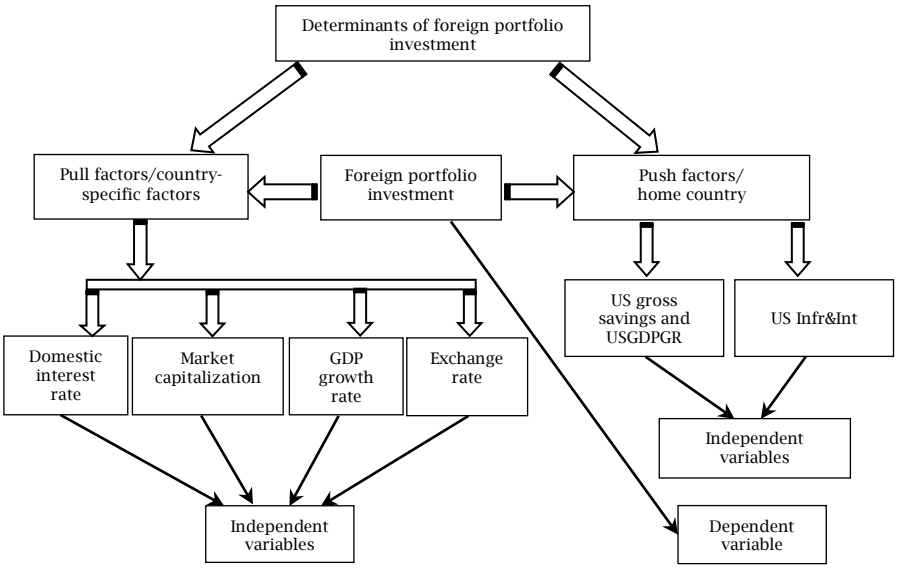
Push factors, on the other hand, reflects the world economic forces that push capital flows from the U.S.A. to other countries and are external to the economies receiving the flows. Examples of such factors are low global risk aversion, low U.S. interest rates and potential growth, international portfolio diversification and a sustained decline in the world interest rate and recession in industrial economies. For instance, when the inflation rate rises in the developed country (home country), it will cause a decline in the purchasing power of funds invested in the country of the investors, that is, their home country. This change will cause foreign investors to withdraw their investment from the home country and transfer the same fund to the developing country (host country). The implication is that an increase in foreign inflation will bring about inflows of huge investment to the host economy and vice versa. Therefore, when foreign investors move from their home country to the host country to invest as a result of an unfavourable inflation rate, the inflation rate becomes a push factor while the host country's inflation rate will be referred to as a pull factor. Also, considering the world interest rate such as U.S. interest rate on return, Kaur and Dhillon (2010) discovered that U.S. 3-month T-bill rate (USTBR) representing foreign interest rate has a significant and adverse impact on foreign institutional investors' (FII) investment in host (Indian) stock market. This adverse effect implies that a decrease in the U.S. interest rate on return will push foreign investors to the developing countries.

Summarily, push factors are those factors that are exogenous to any particular country that induces investment to flow outward (home country) whereas pull factors are attributes of the host country. These pull factors are majorly a function of the host countries' policies and are controlled by the developing countries while the push factors are highly volatile in which their control is beyond the reach of the policymakers (Fernández-Arias, 1996).

2.2. Conceptual framework

The framework below (Figure 1) explains the determinants of foreign portfolio investment. From the framework, determinants of foreign portfolio investment flows are divided into pull and push factors. Pull factors are the country-specific factors or internal factors peculiar to the host country that determines the flow of foreign portfolio investment in the country. The pull factors are numerous in literature but limited to market capitalization, domestic real interest rate, real exchange rate and GDP growth rate as used in the work of Kaur and Dhillon (2010). The domestic interest rate represents the rate of return on securities which brings about an increase in foreign portfolio investment inflow if there is an increase in the rate but if otherwise, a decrease sets in. This is because prospective investors would only intend to invest where the securities are profitable. Market capitalization shows the valuation of firms' securities which assist an investor to diversify its risk. The better the market capitalization, the higher the inflow of foreign portfolio investment. GDP growth rate also determines the viability of investment in the host country. The devaluation or revaluation of a country's currency will affect the flow of investment of other countries. On the other hand, the push factor explains that investment is determined by what happens on the international front. Fernández-Arias (1996) argues that push factors, particularly low the U.S.A. interest rates have a dominant role in driving capital flows into developing countries. This is the intention behind the use of the U.S.A. interest rate and the U.S.A. GDP growth rate, the U.S.A. gross savings and the U.S.A. inflation rates as the independent variables which represent the push factors.

Figure 1. The determinants of foreign portfolio investment using the pull and push analysis



Source: Authors' design.

2.3. Empirical review

2.3.1. Evidence from developed country

On the determinants of capital flows to Mexico, Ibarra and Tellez-Leon (2020) discovered that an increase in the foreign interest rate increase and global risk leads to lower portfolio investment while higher the United States of America GDP growth rate and exchange rate have a positive impact on portfolio investment. The variables that represent push factors were a global risk, the injection of liquidity, the inflation and interest rate (IIR) and United State of America gross domestic product (USGDP) growth while the pull factors were the growth rate of Mexican GDP, the interbank interest rate, the Mexican inflation and the exchange rate the study concludes that capital flows to Mexico are mainly driven by global and domestic conditions rather than conditions in other emerging economies. A vector autoregressive model for the period 1995-2015 was employed for analysis.

Humanicki, Kelm, and Olszewski (2017) assessed foreign direct and portfolio investment in the contemporary globalized world. Qualitative and quantitative research design was used in the study. Times series data spanning 2002-2013 was used in the study. Data amassed in the study was analyzed using univariate integration and cointegration tests. Findings from the study suggest that there exists a noticeable long-run relationship between foreign direct investment and foreign private investment, real interest rate, labor costs and market size of Poland. The premise of these findings, the study concludes that foreign direct investment and foreign private investment may be considered as substitutes. Haider, Khan, and Abdulahi (2016) investigate the determinants of foreign portfolio investment in the Chinese economy between 1997 and 2014. The study employed multiple regression models on the data of FPI, GDP, FDI, EXR (exchange rate), EXD (external debt) and population growth and discovered that GDP and external debt are the strong determinants of the FPI in China. In the same vein, Ahmad, Draz, and Yang (2015) explored the determinants of FPI in China between 2001 and 2010 by using a multiple regression model for the purpose of analysis. The authors discovered that external debts are the most significant determinant of FPI for China.

Using the OLS method with data between 2004 and 2010, Agung, Nugroho, and Yanfitri (2011) examine the factors affecting capital flows in the stock market, State Bureau Investigation (SBI) and government securities (SUN) in Indonesia. They discovered that the capital flows are positively influenced by domestic economic growth (production index) and domestic interest rate changes (pull factors) and the level of global risk, the global liquidity excess (money supply in the U.S.A.) and the changes in the U.S.A. interest rates (push factors). Meanwhile, capital flows are negatively affected by the U.S.A. economic growth. Egly, Johnk, and Liston (2010) employ a vector autoregressive model to examine the relationship between net foreign portfolio investment inflows and pull factors and discovered that net corporate bond inflow responds insignificantly to positive shocks to the stock market but does not respond to risk aversion. Bond, on the other hand, has a positive and significant relationship with risk aversion. The study concludes to pull factors may determine the inflow of foreign portfolio inflows.

It was also discovered in the works of Faruqee, Li, and Yan (2004) on the determinants of international portfolio holdings and home bias in 23 developed countries namely: Australia, Austria, Belgium, Canada, Hong Kong (SAR), Denmark, Finland, France, Germany, Ireland, Italy, Japan, Malaysia, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, the United States of America, that foreign portfolio investment is majorly determined by market size, transaction cost and information asymmetry.

2.3.2. Evidence from developing countries

Al-Smadi (2018) investigates the determinants of foreign portfolio investment in Jordan from 2000 to 2016. Using regression analysis, the study discovered that stability and conduciveness of the macroeconomic environment attracts foreign investors. Also, foreign investors prefer to invest in the capital market which provides an opportunity for risk diversification. Singhania and Saini (2018) examined the determinants of FPI in 19 developed and developing countries between 2004 and 2013. For the purpose of analysis, fixed and random effects with the generalized method of moments (GMM) were employed. The result revealed that as a group of 19 countries, interest rate differentials, freedom index, the U.S.A. stock market and host country stock market returns significantly influence foreign portfolio investments. Chaudhry, Farooq, and Mushtaq (2014) study the factors that affect the portfolio investment in Pakistan between 1981-2012. The study concludes that market capitalization, weighted average rate of return on deposit, trade openness, broad money (M2) have positive relationship with net portfolio investment while foreign direct investment has a negative impact on foreign portfolio investment. The autoregressive model of partial adjustment and the least-square method were employed for the purpose of analyses.

Nwosa and Adeleke (2017) assessed the determinants of foreign direct investment and foreign private investment volatility in Nigeria. Employing the EGARCH model, the study gleaned time series data spanning 1986 to 2016 from the Central Bank of Nigeria (CBN) Statistical Bulletin. Econometrics estimations including descriptive, Augmented Dickey-Fuller (ADF) unit root test, ARCH test and EGARCH regression were used in analyzing data gathered in the study. Findings from the study revealed that trade openness and world GDP were the significant determinants of FDI volatility, while domestic interest rate and stock market capitalization were significant determinants of FPI volatility in Nigeria. Also, Gossel and Biekpe (2017) investigate foreign (push) and domestic (pull) factors impact on South Africa's capital inflows over the period of 1986-2013. Employing a vector error correction model, the results show that portfolio inflows are pushed in both the short run and the long run by USGDP and interest rate. The pull factors are trade openness, exchange rate volatility,

share price performance and the government budget deficit, GDP and SA treasury bill. The findings revealed that the push factors outweigh the pull factors which suggests that the country's macroeconomic stability is vulnerable to short-run foreign business cycle fluctuations. Onuorah and Akujobi (2013) examine the impact of macro-economic variables on foreign portfolio investments in Nigeria between the periods of 1980-2010. The cointegrations test revealed that among the identified macroeconomic variables, GDP and money supply had inverse relationship with FPI while interest rate, exchange rate and inflation rate were directly related to FPI. Granger causality results revealed that macroeconomic variables do not granger caused FPI.

In a study on the determinants of portfolio flows to Ghana, Ahortor, and Olopoenia (2010) discovered that public investment, international interest rate and capital stock accumulation have positive impacts on both foreign portfolio flows. However, distortionary tax rate, global inflation rate, real domestic money balances, public expenditure on foreign good and the domestic interest rate has negative impacts on both portfolio inflows and outflows. Markov Chain Monte Carlo (MCMC) techniques based on simulation and calibration were employed for the purpose of analysis. Syed, Muhammad, and Shahab (2010) worked on the pull factors of foreign portfolio investment for Pakistan over a period of 2000-2010 by using autoregressive distributed lag (ARDL) approach to cointegration. The study discovered that trade openness and share price index have a significant impact on foreign portfolio investment while the relationship of foreign portfolio investment with inflation and interest rate is insignificant.

Kaur and Dhillon (2010) also explored the determinants of FIIs investment in India using an error correction mechanism. The study discovered that Indian stock market return, market capitalization, financial liberalization, economic growth and U.S.A. inflation rate have a positive impact on foreign institutional investors. Whereas, the U.S.A. stock market returns Indian inflation and stock market risk and the U.S.A. interest rate have no significant influence on FIIs investment to India. The authors conclude that FIIs inflow in India is determined by both stock market characteristics and macroeconomic factors.

From the review of related studies, it can be deduced that there are no sufficient studies on the determinants of foreign portfolio investment in emerging markets such as Nigeria. Moreover, most of the available studies focused on the pull factors only. However, this study contributes to existing knowledge by including the home country-specific factors (push factors) in a bid to ascertain the major determinants of foreign portfolio investment flows to Nigerian economy and compare the result with the works of Kaur and Dhillon (2010) for India.

3. RESEARCH METHODOLOGY

3.1. Hypotheses testing

The hypotheses for this study are stated in null form as follows:

H_{01}: The pull factors (market capitalization, domestic interest rate, GDP growth rate and real exchange rate) have no significant effect on foreign portfolio investment flow to emerging markets.

H_{02}: The push factors the U.S.A. GDP growth rate, the U.S.A. gross savings, the U.S.A. interest rate and the U.S.A. inflation rate have no significant effect on foreign portfolio investment flow to emerging markets.

3.2. Model specification

This study can be analysed through the estimation of impulse-response functions from a vector autoregression (VAR) model. However, the functional model employed was adapted from the works of Kaur and Dhillon (2010) on the determinants of foreign institutional investors' investment in India using the ARDL approach to cointegration but modified as follows:

$$ln(FPI_t) = f[ln(MCAP_t), ln(DMINT_t), ln(GDPGR_t), ln(REER_t), ln(USGDPGR_t), ln(USGS_t), ln(USINT_t), ln(USINFR_t)] \quad (1)$$

It can also be mathematically expressed as:

$$ln(FPI_t) = \beta_0 + \beta_1 ln(MCAP_t) + \beta_2\, ln(DMINT_t) + \beta_3\, ln(GDPGR_t) + \beta_4\, ln(REER_t) + \beta_5\, ln(USGDPGR_t) + \beta_6\, ln(USGS_t) + \beta_7\, ln(USINT_t) + \beta_8\, ln(USINFR_t) + \varepsilon_t \quad (2)$$

where:

- FPI_t = foreign portfolio investment at time t;
- $MCAP_t$ = market capitalization at time t;
- $DMINT_t$ = domestic interest rate at time t;
- $GDPGR_t$ = GDP growth rate at time t;
- $REER_t$ = real exchange rate at time t;
- $USGDPGR_t$ = the United States of America growth rate at time t;
- $USGS_t$ = the United States of America gross savings at time t;
- $USINT_t$ = the United States of America interest rate at time t;
- $USINF_t$ = the United States of America inflation rate at time t;
- ln = log;
- ε_t = error term.

3.3. Estimation techniques

For the purpose of analysis, the long-run autoregressive distributed lag and error correction model with short-run estimate were employed in this study to discover the determinants of foreign portfolio investment flows to Nigeria. These were employed because it incorporates long-run equilibrium relationship and short-run dynamics, unlike the ordinary least square that is short run oriented and prone to spuriosity of the result. This technique can only be used if the results of the unit root test show a combination of stationarity I(0) and non-stationarity I(1).

The long-run ARDL estimate and ECM for this study are presented below:

$$\Delta ln(FPI_{t-1}) = \beta_0 + \beta_1 ln(MCAP_{t-1}) + \beta_2\, ln(DMINT_{t-1}) + \beta_3\, ln(GDPGR_{t-1}) + \beta_4\, ln(EXGR_{t-1}) + \beta_5\, ln(USGDPGR_{t-1}) + \beta_6\, ln(USGS_{t-1}) + \beta_7\, ln(USINT_{t-1}) + \beta_8\, ln(USINFR_{t-1}) + \varepsilon_t \quad (3)$$

The specification for the short-run dynamics based on the error correction model is specified below:

$$\Delta ln(FPI_{t-1}) = \beta_0 + \sum_{i=1}^{p} \Delta ln(FPI_{t-1}) + \sum_{i=2}^{p} \Delta ln(MCAP_{t-1}) + \sum_{i=3}^{p} \Delta ln(DMINT_{t-1}) + \sum_{i=4}^{p} \Delta ln(GDPGR_{(t-1)}) + \sum_{i=5}^{p} \Delta ln(REER_{t-1}) + \sum_{i=6}^{p} \Delta ln(USGDPGR_{t-1}) + \sum_{i=7}^{p} \Delta ln(USGS_{t-1}) \sum_{i=8}^{p} \Delta ln(USINT_{t-1}) + \sum_{i=9}^{p} \Delta ln(USINFR_{t-1}) + \varphi ECM_{t-i} \quad (4)$$

where:

- φ = speed of adjustment parameter;
- ECM = error correction residual derived from the estimation of the cointegration model of ARDL.

$$ECM_t = ln(FPI_t) - \beta_1 ln(MCAP_t) + \beta_2\, ln(DMINT_t) + \beta_3\, ln(GDPGR_t) + \beta_4\, ln(REER_t) + \beta_5\, ln(USGDPGR_t) + +\beta_6\, ln(USGS_t) + \beta_7\, ln(USINT_t) + \beta_8\, ln(USINFR_t) \quad (5)$$

3.4. Sources of data, scope of the study and *a priori* expectations

The data used for the study is secondary, extracted from several issues of the publications by the CBN Statistical Bulletin, the Federal Reserve Bank of the United States of America and the World Data Bank (2020). The scope of the study is from 1986 to 2018.

It is expected that the pull factors (MCAP, DMINT, GDPGR and REER) will positively affect the flow of foreign portfolio investment to Nigerian economy. This expectation is based on the assumption that market capitalization improves with an attractive domestic interest rate on investment, therefore, foreign investors will be encouraged to invest in such enabling environment. Moreover, the GDP growth rate and the favourable exchange rate will go a long way to pull foreign investment from other countries. On the other hand, the push factors (the U.S.A. GDPGR and the U.S.A. interest rate) will negatively affect foreign portfolio investment flows to Nigeria while USGS and inflation will have a positive effect on portfolio investment flows to Nigeria. The *a priori* expectation and measurement of the variables used in the study are detailed in Table 1.

Table 1. Description and measurement of variables

Variable	*Measurement*	*A priori expectation*
Market capitalization (MCAP)	This is the aggregate valuation of the company based on its current share price and the total number of outstanding stocks. It is calculated by multiplying the current market price of the company's share with the total outstanding shares of the company.	$\frac{MCAP}{FPI}$, +
Domestic interest rate (DMINT)	This includes lending rate less risk premium rate.	$\frac{DMINT}{FPI}$, +
Gross domestic product growth rate (GDP)	This captures the percentage growth in Nigerian gross domestic product.	$\frac{GDPGR}{FPI}$, +
Real exchange rate	This refers to the relative price of a currency.	$\frac{REER}{FPI}$,+
US gross domestic product growth rate (USGDPGR)	This captures the percentage of growth in the United States of America gross domestic product.	$\frac{USGDPGR}{FPI}$, -
US gross savings (USGS)	Gross savings are measured as gross national income less total consumption, plus net transfers.	$\frac{USGS}{FPI}$, +
US interest rate (USINT)	This captures the increase in the value of the loan as well as interest with regard to inflation.	$\frac{USINT}{FPI}$, -
US inflation rate (USINFR)	This captures the rate at which prices of goods and services are rising with a fall in purchasing power in the United States of America.	$\frac{USINFR}{FPI}$, +

Source: Authors' compilation.

4. RESULTS AND FINDINGS

4.1. Correlation analysis

The diagonal of the correlation matrix in Table 2 reveals that the correlation between a variable and itself is perfect and positive (1.000). Summarily, the correlation matrix reveals a significant and strong positive correlation between FPI and MCAP (55%), USGDPGR and USGS (64.9%), USINFR and USINT (68.3%), while a strong negative but significant correlation exist between MCAP and USINT (70%).

Table 2. Correlation matrix

Variables	*FPI*	*MCAP*	*DMINT*	*GDPGR*	*REER*	*USGDPGR*	*USGS*	*USINT*	*USINF*
FPI	1.000								
MCAP	0.553	1.000							
	0.0008								
DMINT	0.358	0.047	1.000						
	0.040	0.794							
GDPGR	-0.181	-0.038	-0.217	1.000					
	0.312	0.831	0.225						
REER	-0.142	-0.039	-0.309	-0.249	1.000				
	0.427	0.829	0.079	0.161					
USGDPGR	-0.016	-0.309	0.138	-0.246	0.280	1.000			
	0.927	0.079	0.442	0.166	0.114				
USGS	-0.037	-0.140	0.132	-0.224	0.326	0.649	1.000		
	0.835	0.436	0.463	0.210	0.063	0.000			
USINT	-0.374	-0.704	-0.139	-0.172	0.139	0.425	0.453	1.000	
	0.031	0.000	0.438	0.337	0.438	0.013	0.008		
USINF	-0.231	-0.451	0.079	0.046	-0.304	0.201	0.131	0.683	1.000
	0.194	0.008	0.659	0.797	0.085	0.261	0.465	0.000	

Source: Authors' computation.

To test for multicollinearity among the variables, variance inflation factor (VIF) and tolerance level are employed and presented in Table 3.

Decision rule:

H_0: There is no multicollinearity if the tolerance level is more than 10% and VIF is less than 10.

H1: There is multicollinearity if the tolerance level is less than 10% and VIF is greater than10.

Table 3. Tolerance and variance inflation factor result

Variable	*Tolerance*	*VIF*
MCAP	0.36	2.73
DMINT	0.61	1.61
GDPGR	0.69	1.43
REER	0.56	1.76
USGDPGR	0.49	2.01
USGDS	0.38	2.60
USINT	0.15	6.63
USINF	0.31	3.18

Source: Authors' computation from EViews.

The collinearity result reveals that the tolerance level is more than 10% and none of the variance inflation factor is higher than 10. Based on the decision rule, the null hypothesis is accepted. Hence, the model is unbiased and free from multicollinearity.

4.2. Unit root test

The summary of the Augmented Dickey-Fuller (ADF) test of the unit root for the model is presented in Table 4.

Table 4. Summary of order of integration

Variables	*Prob. value*	*Order of integration*
FPI	0.0320	I(0)
MCAP	0.0000	I(1)
DMINT	0.0232	I(0)
GDPGR	0.0063	I(0)
REER	0.0044	I(0)
USGDPGR	0.0179	I(0)
USGS	0.0163	1(1)
USINT	0.0312	I(1)
USINFR	0.0001	I(1)

Source: Authors' computation.

The unit root test result in Table 4 reveals that FPI, DMINT, GDPGR, REER and USGDPGR are stationary at level I(0) while MCAP, USGS, USINT, USINFR are non-stationary at the first difference I(1). This further suggests that to determine the existence of cointegration among the variables in the long run, Johansen cointegration cannot be conducted since they are not stationary in the same order.

4.3. ARDL bound test result

Having established that the variables are integrated of different orders, we proceed to analyse if there exists any cointegration among the variables using the ARDL bound test approach. The null hypothesis of no cointegration is rejected if the F-statistic is higher than the critical value of both I(0) and I(1) regressors, and accepted if otherwise. The result is presented in Table 5.

Table 5. ARDL and bound test for cointegration result

Critical value	*Lower bound value*	*Upper bound value*
1%	2.79	4.1
5%	2.22	3.39
10%	1.95	3.06
F-statistic = (5.083)		

Source: Authors' computation.

The result reveals that F-statistic (5.083) is greater than the upper bound (Table 5). Therefore, there exist long-run relationships among the variables. This implies that the variables can relate together for a long period of time to explain the determinants of foreign portfolio investment flow to Nigeria. This result guarantees analyzing the level of a long-run relationship among the variables by applying the ARDL long-run model.

4.4. Diagnostic test result

Several diagnostic and stability tests to check for the robustness of the ARDL model were conducted. They include: serial correlation (LM test), Breusch-Pagan-Godfrey heteroskedasticity test, CUSUM test and CUSUM of square. The results are presented in Table 6.

Table 6. Result of serial correlation and heteroskedasticity for ARDL model

Source	*LM test*	*Heteroskedasticity test*
F-stat	0.22685	2.0971
Prob-F	0.6419	0.0756
Prob Chi-square	0.5623	0.0973
Obs R-square	0.3376	14.776

Source: Authors' computation.

Table 6 revealed that the entire test is statistically significant since the p-value (0.6419, 0.0756) is greater than 5% significant value. The implications are that the model residuals are free from the presence of serial correlation and heteroskedasticity threats.

4.4.1. CUSUM test result

The result of the cumulative recursive residuals reveals that there is stability in the long run coefficients of pull and push factors with respect to foreign portfolio investment. The stability among the variables is confirmed since the graph plotted portrays that the CUSUM statistics is resting neatly within the boundaries at 5% significant level. The CUSUM of squares result also confirms the existence of stability among the variables since the graph plotted portrays that the CUSUM of square statistics is resting neatly within the boundaries at 5% significant level.

Figure 2. Cumulative recursive residuals result

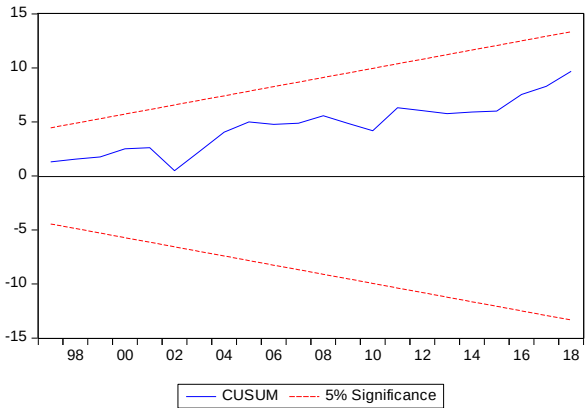


Figure 3. Cumulative recursive residuals of squares result

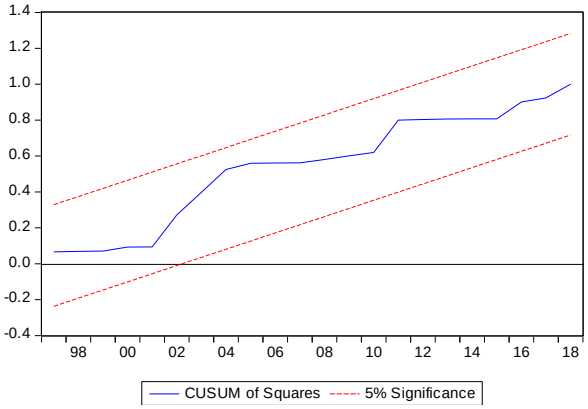


Table 7. ARDL long-run model result

Variables	*Coefficients*
C	-391333
FPI(-1)	0.1669
MCAP(-1)	0.1669
DMINT(-1)	18.884
GDPGR(-1)	-1049.45**
REER(-1)	9.0280
USGDPGR(-1)	-3802.66***
USGS(-1)	2802.07**
USINT(-1)	-1727.9
USINFR(-1)	4282.5*
R^2	0.6741
Adjusted R^2 (Prob F – statistic)	0.5408 (0.000921)***

*Note: *** ** and * signify 1%, 5% and 10% significance levels, respectively.*

Table 7 shows that the lag of GDPGR, USGDPGR and USINT has a negative effect on foreign portfolio investment while other variables showed otherwise. That is, a unit increase in GDPGR, USGDPGR and USINT will lead to a decrease of 1049.45, 3802.66 and 1727.9 in FPI. On the contrary, a unit increase in MCAP, DMINT, REER and USGS will give rise to an increase of 0.1669, 18.884, 9.0280 and 2802.07 units in FPI respectively. However, in all the variables, only the lag of GDPGR, USGDPGR, USGS and USINFR had a significant effect on FPI at 1%, 5% and 10% significant level with coefficients -1049.45, -3802.66, 2802.07 and 4282.5 respectively. The result of R^2 depicts that, in the long run, the variables can explain 67.41% variation in foreign portfolio investment and that there is a very strong long-run relationship among the variables. The probability for F-statistic also shows that the overall model is significant at 1% significant level (0.000921).

Table 8. ARDL ECM result

Variables	*Coefficients*	*Probability value*
C	-555.83	0.6005
D(FPI(-1)	0.4086	0.0362
D(MCAP(-1)	0.1816	0.6956
D(DMINT(-1)	-160.228	0.5560
D(GDPGR(-1)	-1552.99	0.0000
D(REER(-1)	3.55415	0.8640
D(USGDPGR(1)	-2824.9	0.0009
D(USGS(-1)	2622.77	0.0337
D(USINT(-1)	-331872	0.0107
D(USINFR(-1)	8362.46	0.0046
ECM(-1)	-1.5254	0.0001
R^2	0.8054	

Source: Authors' computation.

Table 8 reveals the relationships among the pull, push factors and foreign portfolio investment in the short run. There exist positive relationships between MCAP, REER, USGS and USINFR and FPI. Also, a negative relationship exists between DMINT, GDPGR, USGDPGR, USINT and FPI as revealed by the result. However, only the effect of GDPGR, USGDPGR, USGS, USINT and USINFR on foreign portfolio investment is significant. The result also revealed that the speed of adjustment (ECM) among the variables in the short run is fast and significant.

5. DISCUSSION

The study focused on the determinants of foreign portfolio investment flows to Nigeria. From the analysis, it can be inferred that the domestic interest rate has a positive but insignificant impact on foreign portfolio investment in the long run. This implies that an increase in the domestic interest rate on investment will encourage foreign investors to invest their resources in Nigeria because the objective of a rational investor is to minimize risk and maximize returns. Also, a change in the domestic interest rate is insignificant in determining the flow of foreign portfolio investment to Nigerian economy. The null hypothesis is hereby accepted. This finding is inconsistent with the works of Ahortor and Olopoenia (2010) but in line with the a priori expectation. The Nigerian economy proxied by the gross domestic growth rate has a negative but significant impact on the flow of foreign portfolio investment to the country both in the short and long run. This implies that the higher the growth rate in the total production of goods and services in the economy, the less the number of investors that will be encouraged to invest their resources economy. This contradicts the theory of growth and the *a priori* expectation. This deviation could be as a result of other factors such as debt burden, lack of conducive business environment, defective legal and political system and investment insecurity regardless of the GDP growth rate in the economy. However, the significance of the GDP growth rate as a pull factor that determines the flow of foreign portfolio investment is consistent with the findings of Ibarra and Tellez-Leon (2020) and rejects the null hypothesis.

The capital market is expected to be a significant factor in determining the foreign investment but the result shows that the capital market proxied by market capitalization, shows a positive but insignificant relationship with foreign investment in the short and long run and confirmed by Chaudhry, Farooq, and Mushtaq (2014). The positive sign is in conformity with the *a priori* expectation and the null hypothesis. This implies that, though the size of Nigerian capital market can attract the inflow of foreign portfolio investment in Nigeria, it is not a significant factor to guarantee foreign portfolio investment flows to its economy. Exchange rate is the rate at which the currency of a country is exchanged for the other. A favourable exchange rate will encourage foreign investors while an unfavourable one will not. From the result of the analysis, it is revealed that foreign portfolio investment is a positive function of the exchange rate in the long run and short run. This implies that the increase in Nigerian exchange rate encourages foreign investors with the assurance that when the return from investment is repatriated, they will have more profit to repatriate. The repatriation, however, is detrimental to Nigerian economy. This is supported by the works of Onuorah and Akujobi (2013) and in line with the theoretical expectation. The push factors of foreign portfolio investment namely the U.S.A. GDPGR and USINT, show negative relationships with significant and insignificant effect respectively in the long run and short run while the U.S.A. gross savings and the U.S.A. inflation rate has positive impacts on foreign portfolio investment flows. This is consistent with the *a priori* expectation. The negative but significant relationship between foreign portfolio investment and the U.S.A. GDPGR and confirmed in the works of Agung, Nugroho, and Yanfitri (2011) implies that decline in the growth of the U.S.A. economy as represented by its gross domestic product growth rate, will push foreign investors out of the U.S.A.to invest their funds in the emerging markets. This is possible due to the fact that investors in an economy with a low or decrease in GDP growth rate prefer to invest in other economies where there are attractive or perceived better market opportunities such as increasing GDP growth rate, high population, lower cost of production, availability of raw materials, cheap labour, etc.

Moreover, the negative effect of USINT shows that a decrease in the rate of return on investment in the U.S.A. would push foreign investors out of Nigerian economy and vice versa since many investors seek to maximize returns on investment. This is in line with the *a priori* expectation and the findings of Fernández-Arias (1996) and Kaur and Dhillon (2010). However, the effect is insignificant to confirm the attitude of foreign investors to changes in the world interest rate. The foreign interest rate is not significant enough to deter foreigners from the benefits attributable to profitable investment in the emerging market, considering other benefits.

The result also shows that the U.S.A. gross savings and inflation rates have a positive and significant impact to determine the flow of foreign portfolio investment in emerging markets. This is in conformity with the *a priori* expectation and rejects the null hypothesis. Availability of sufficient savings in the developed economies could be a significant factor to push investors to emerging markets in other to diversify their investment. Moreover, an increase in the rate of inflation could reduce the rate of return on investment, thereby push investors out to emerging markets where there is a low rate of inflation.

6. CONCLUSION

The study investigated the pull and push factors as determinants of foreign portfolio investment flows to the emerging market, using Nigeria as a case study, from 1986 to 2018. Secondary data on foreign portfolio investment and the theoretically selected pull and push factors were used while autoregressive distributed lag, ARDL bound cointegration test and error correction mechanism were employed for the purpose of analysis. In order to achieve the objectives of the study, the result revealed that of all the explanatory variables, only MCAP, DMINT, REER, USGS and USINFR have a positive effect on FPI while GDPGR, USGDPGR, USGS and USINFR proved significant. The f-test revealed that the model is statistically significant at 5% significant level while the result also showed that a long-run relationship exists among the variables. From the result of the analysis, the study concludes that the major pull and push factors that determines foreign portfolio investment flows to Nigeria are: gross domestic growth rate (pull factor) and USGDPGR, USGS and USINFR (push factor). Based on these findings, the study recommends that the growth rate of the gross domestic product of

emerging markets is essential to attract foreign portfolio investment flows with the effective management of the exchange rate. Moreover, regulatory authorities should make the environment of the capital market conducive for foreign investors by improving its market capitalisation. However, the influence of external factors on the inflow of foreign portfolio investment is attributed to the performance of the U.S.A. economic growth rate, interest rate on government securities and inflation rate. Therefore, since this push factor cannot be controlled directly, economic policymakers in Nigeria should be more committed to strengthening its economy by boosting its GDP in order to push foreign investors to the economy since the dwindling in economic growth, low rate on return and rise in inflation rates of the developed countries such as the U.S.A. could push investors to explore in the emerging markets.

The study concurs with the works of Kaur and Dhillon (2010) that both push and pull factors are determinants of foreign portfolio flows to the emerging market.

This study is limited to Nigerian economy which is not sufficient to generalize the result for countries regarded as emerging markets. Therefore for further research cross country analysis could be used to confirm the results from this paper. Moreover, the developing countries are most times not conducive for foreign investors as a result of accrued debt burden as discovered in the works of Ahmad, Draz, and Yang (2015). Therefore the level of debt burden could be included among the pull factors so as to empirically confirm its impact on the flow of foreign portfolio investment flows to the emerging markets.

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