

## **Chapter One**

### **Introduction**

#### **1.1 Background to the Study**

The assumption of the neoclassical economic theory of trade and growth implies that capital should flow from regions with a low marginal product to where it attracts higher marginal product. Africa should, in reality, be the destination of such capital inflows, however, it is a high recipient of bailouts, aids, and grants<sup>1</sup>. As the last frontier market owing to her untapped natural resources and human capital waiting to be exploited, of which, such opportunistic venture can only be carried out with large investment. This is unfortunate as the amount of financial wealth in the continent is not sufficient to carry out profitable ventures into the numerous sectors its countries have, thus, there is a need for capital inflows to augment the domestic capital<sup>2 3 4</sup>.

Capital inflows are beneficial to any economy as it helps the economy improve the allocation of scarce resources as flows are associated with economic growth<sup>5</sup> among other benefits. As posed by the neoclassical theory, capital is to flow from capital-rich to poor economies due to the high rates of interest in the capital-poor countries<sup>6</sup>. In the past three decades, capital flows have followed the theory to the latter as flows moved from North to South that is, capital flows were interest-driven and moved from rich to poor countries<sup>7</sup>.

Among countries of the world, Latin America and Asian economies being poor or developing economies have been the recipient of such large inflows compared to Africa which has only garnered a few of the flows<sup>8</sup>. From 1970-1979, Asian and Latin American economies gained an average of \$ 2,106,581,092 and \$3,002,003,366 respectively while Sub Saharan Africa received \$934,602,579. Also, from 1980-1989, Asian and Latin American economies received an average

of \$5,730,117,623 and \$13,325,258,609 respectively, while Sub Saharan Africa received an average of \$1,222,453,666. The major determinant of attracting capital inflows to these economies was the high rate of interest coupled with other determinants such as quality institutions, high financial institutions, and more. These economies that attracted flows over the decades possessed majorly high-interest rates. However, in the last decade, capital has changed its pattern and that also suggests that its determinants also have changed. More capital now flows to countries with higher to medium income and fewer capital flows to developing countries where it is needed the most<sup>9 10</sup>. This raises the question posed by Lucas in a reversed order “why do capital now flow to poor economies” since they are notable for being high risks.

Africa is the largest recipient of foreign aid and grants but such aids and grants are not profitable as they are mostly accompanied by conditions of their usage which in the long run make countries dependent<sup>11</sup>. Comparing data from 1990-2018, shows that Africa is the destination for most aids and grants but not the investment-worthy kind, capital inflows. The former, aids and grants do not make economies thrive or grow, they only help to fulfill a needed commitment<sup>12</sup> but the latter, generally referred to as capital inflows translate to economic viability and facilitates growth<sup>13</sup>. Remittances are another type of capital flow that results from payments from multinational corporations. In this study, remittances are not considered in the type o capital inflows as they are majorly subject to profits from the multinational corporation as well as the number of illegalities that occur with this type of capital flow.

The global economy has been shaken by three large shocks between 2008 and 2014 that have in no doubt impacted the size and composition of capital inflows<sup>14</sup>. Its impact, however, is far from being homogeneous across regions and country groups. But the evolution of gross capital inflows over the last two decades displays a largely similar pattern in highly industrialized countries and

emerging countries in general, but a markedly different path in Sub-Saharan African countries. What explains these different trends and why does it matter? These are the questions that analysis of literature has tried to provide answers to<sup>15</sup>. This thesis' main focus is twofold: one, the evolution of capital inflows shows divergent patterns for capital inflows into the different sectors of the economy. And two, the drivers of capital inflows to Nigeria.

### *Table 1*

Africa is the least recipient of capital inflows to date, but there is an increase in the volume of capital inflows into the continent. Despite a relatively low rate of capital inflow into Africa, there is a consensus that without a significant amount of new capital injection, Africa's development objective cannot be achieved<sup>16</sup>. Among countries in the continent, Nigeria is the largest recipient of capital inflows this is owing to its large population, growing and diversified markets, skilled labour, and dynamic economic policies among others. From the period of 1978-1987, the average capital inflows grew by 150%, 3129%, 674%, 1244%, and 134% lesser in Ghana, Benin Rep., Cameroon, Egypt, and South Africa respectively all in ratio to Nigeria. Within the periods of 1988-1997, the average capital inflows into Nigeria in ratio to other African countries; Ghana, Benin Rep., Cameroon, Egypt, and South Africa was 172%, 3349%, 828%, 1135%, and 126% lesser respectively. Similarly, within the periods of 1988-2007, the average capital inflows into the aforementioned African countries in ratio to capital inflows into Nigeria were 161%, 3242%, 748%, 1184% and 130% lesser respectively. Finally, within 2008-2017 average capital inflows into Ghana, Benin Rep., Cameroon, Egypt, and South Africa compared to Nigeria was 161%, 3242%, 748%, 1184%, and 130% respectively lesser than the number of capital inflows into Nigeria. Nigeria is a suitable economy to be studied owing to the economic advantage it has over other African economies, as a result of her being a recipient of large capital inflows.

The world has become ever integrated and this is a result of globalization. In the global market, financial capital continues to move from country to country. Capital inflows have been attributed to the development of an economy. Any economy can raise new resources and capital by amassing wealth domestically and by capital influx from the external context. Since capital inflows enhance investment if sustained, it increases growth and per capita income. This subsequently brings about a rise in the degree of savings domestically and likewise acceleration of domestic resources, thereby gradually closing the savings gap<sup>17</sup>. Nevertheless, Nigeria remains poor and ranked in the world as the poverty capital. Studies have focused on the different types of flows as well as the type of economies they flow to. But the change in the pattern of flows indicates that there is a new determinant of flows which discovering it sheds light to capital inflows in general.

The inflow of capital to Nigeria has been driven by the volume of mineral resources<sup>18</sup> compared to other continents such as Asia and South America their inflows were interest-driven. The observation could ultimately explain why some countries garner more capital inflows than others, as a country with more natural resources are expected to have more inflows compared to those with less. However, this is not enough to cement the notion that only countries with large resources have begun to attract such large inflows. Data shows that the oil and non-oil sectors of the Nigerian economy attracted over 3 trillion dollars between the periods of 2015 to 2018<sup>19</sup>. The interesting fact about the data is that sectors that attracted flows were widely comparatively different. So, it is intriguing, therefore the why and what should be looked into. As our assumption now suggests there exist country-specific factors that have not been captured that facilitate capital inflows into sectors (oil and non-oil) of an economy.

Nigeria is an emerging market with vast arable land, large labour force, industry, large market

size, and mineral resources yet struggle with attracting capital inflow that is crucial for the development of the economy. With the prevalence of global risk aversion that mitigates inflows to the economy. Therefore, this suggests that capital inflows have changed their pattern and determinants. So, there is a need to investigate the reasons why capital inflows into the sector vary in size and are no longer predictable.

## **1.2 Statement of the Problem**

Africa's demography possesses large skilled human capital, natural resources, and large market size but for the past decade, it has been classed as an underdeveloped, poverty region of the world among several demeaning names. Despite large capital inflows, its economic reality shows signals of an underdeveloped continent which makes her the major subject in articles associated with setbacks. Literature on capital inflows into emerging economies has focused on the pull and push factors. Few focused on regional factors that result in capital inflows<sup>20 21</sup>. Nevertheless, it is widely agreed that pull and push factors are the major determinants of flows, while regional factors are insignificant in determining inflows<sup>22</sup>, although, there exists an argument that regional factors play a crucial role in determining inflows<sup>23</sup>. Works on capital inflows have focused on the contributions of inflows to economic growth<sup>24 25</sup>. In contribution, policy issues have also been indicated to affect capital inflows<sup>26</sup>.

Previous studies have used one or two sectors in the analysis and have different findings of the major determinants of sectoral capital inflows, of which the results are not sufficient enough due to the volume of data gotten and the comparison of results as very few economics are mono in nature; hence the gap in these studies. Nevertheless, this study fills the void by bringing five major sectors and having a thorough comparison which allows policymakers to have a comparative overview on the sectors that affect them.

The focus of this study Nigeria has a large market and highly skilled labour, coupled with the numerous sectors of the economy which if all were to be efficient in terms of output could outpace developed economies. It has not been researched if inflows are by nature sectoral that is, irrespective of the kind of push, pull, or regional factors existing at a time, flows still move into a specific sector of an economy as earlier works on the sectoral analysis of flows suggest that the manufacturing and banking sectors attracted more flows than others.

However, previous analysis failed to put in cognizance the sectors' performance. This, therefore, necessitates for more empirical contributions on capital inflows to Nigeria to be researched upon as the question of "why certain sectors of the economy succeed more than other sectors in attracting larger inflows?" remains unanswered. With the numerous sectors that exist in Nigeria, the pattern of capital inflows may have changed and its determinant may now be dependent on the individual economy's sectors rather than the overall economy<sup>27</sup>. The declining levels of capital inflows into Nigeria are becoming alarming and the country's specific factors are rather insufficient to sustain capital inflows.

Nevertheless, the individual sectors of the economy have varied dynamics that constitute their success in attracting capital inflows. The success of these sectors could be regarded as the 'sectors performance' which has been untouched in the analysis of past literature, of which if looked into could explain the pattern of capital inflows. To this effect, it is paramount to investigate the sectors of the Nigerian economy that experiences large inflows as well as its determinants and pattern.

### **1.3 Research Questions**

The following main research questions guides the research process:

1. How has sectoral performance led to capital inflows to the sectors in Nigeria?
2. To what extent do pull and push factors determine capital inflows across sectors in Nigeria?

### **1.4 Aim and Objectives of the Study**

The broad objective of this study assessed the determinants of capital inflows to Nigeria based on sectoral analysis. The specific objectives are to;

1. examine the pull and push factors that determine capital inflows across sectors in Nigeria, and;
2. explain how sectoral performance leads to capital inflows across sectors in Nigeria.

### **1.5 Hypothesis**

The study adopts a singular hypothesis owing to the fact that sectoral performance a significant variable used in analysis has not been identified in existing literature as a determinant of sectoral capital inflows and this study aims to evaluate it with the hypothesis that is presented below as:

Ho: “there is no significant relationship between sectoral performance and capital inflows”.

### **1.6 Scope of the Study**

Data gathered ranges from 2010 to 2020, using quarterly data as the period contains several global economic policies, trade agreements, oil price crises, and most recently, the pandemic. The long period effectively captures the true reflection of the analysis. In this study, the sectors of the Nigerian economy is used as the case study. Previous works have investigated the mining, agricultural, banking, and manufacturing sectors of the Nigerian economy but their results are

not comprehensive enough as they did not consider the endogenous factor that affects capital inflows such as the sectors' performance. Therefore, there remains a gap that can be filled by putting the entire sectors of the Nigerian economy, endogenous and exogenous factors that determine capital inflows into the analysis<sup>28, 29, 30</sup>.

### **1.7 Significance of the Study**

The determinants of capital inflows to a particular country vary from one country to another. Existing literature has ignored the fact that capital inflows tend to be sector selecting. With this knowledge, it is important to embark on this study to assist policymakers in Nigeria who are faced with the problem of how to attract flows into the different sectors of the economy. The study is important to economists, policymakers, academia, and economic analysts as it provides a template that helps analyze the different factors that militate against capital inflows to the different sectors of the Nigerian economy.

Also, the study is important to researchers as it adds to the existing body of literature which would be beneficial for future research. This study will also be of importance to students, as it serves as a resource material that will inform them about the factors that facilitate and mitigate capital inflows in Nigeria.

### **1.8 Limitations of the Study**

The limitations encountered during the period of carrying out this study include financial constraints, limited availability of data, and time involved in getting the entire research process done. Some of the data were not available in their needed form and therefore had to be substituted, example of this is the data for capital inflows into the sectors, the agricultural sector was broken into various sub-sectors, such as fishing and farming, the data were added to give the

data used for the agricultural sector. Also, like every empirical literature, this study created a model based on the evidence presented in exiting literature, so therein lies the weakness of the model created. Nevertheless, the model is bet fit with the current economic realities as it incorporate the factors that can be controlled by policymakers and others that are beyond the powers of policymakers but can be cushioned.

### **1.9 Operational Definition of Terms**

**Capital Inflows:** These is the total amount of financial capital that crosses borders into a specific country to yield high interests within a specific period.

**Pull Factors:** These are peculiar country specific variables that are critically instrumental in attracting foreign capital, some are GDP, inflation rate, interest rate, exchange rate, etc.

**Push Factors:** These are external to an extent uncontrollable variables that affect the transfer of capital to countries, they are the United states lending rates, and global financial cycle.

**Sectoral Performance:** This is the change in output of a sector over a period, which could be acritical factor in determining capital inflows.

## Endnotes

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## **Chapter Two**

### **Literature Review**

#### **2.1 Conceptual Review**

The reviews of concepts are in line with variables identified in the literature as affecting the sectoral inflow of capital in the economy.

##### **2.1.1 Capital Inflows**

Capital inflows can only occur in an open economy. Literature on the open economy has emphasizes the importance of gross flows and gross assets as well as the liability positions for both financial and macroeconomic stability<sup>1</sup>. Empirically, the availability of data has allowed for a more detailed study on cross-border gross flows and gross positions. However, theoretically, most of the literature has depended on net capital flow models that were earlier developed. According to the IMF, capital flows can be divided into four components: foreign direct investment (FDI), portfolio equity investment, portfolio debt investment, and other investment, which includes bank lending<sup>1</sup>. Capital flows as well as their drivers are different completely on the scale and driver of these flows. In this study, the combination of all; FDI, FPI, and OFI flows is used in the analysis.

Sectoral analyses on capital inflows are few and there exists a gap to fill. Conceptually, literature on the sector-specific attraction of flows has observed and carried research on the impact of capital inflows on the sectors of the economy without investigating the performance of the sector. Also, existing literature has failed to establish why a sector of an economy attracts more flows than other sectors. In this study, the combination of FDI, FPI, and OFI represents the capital inflows. The following paragraphs explain each type of flow<sup>2</sup>.

Foreign direct investment (FDI) involves any international transaction that results in foreigners owning a particular portion of a domestic firm and results in foreigners wielding authority in some degree of the firm. It is usually based statistically on a threshold of ten percent for consistency across countries<sup>3</sup>. Foreign Direct Investment is any series of concurrent capital inflow into an economy directed to establish, acquire or multiply production capabilities in any new market. FDI can be expatiated upon as any process or activity that results in the acquisition of tangible assets in a foreign market<sup>4</sup>. FDI is relatively stable and desired by the domestic economy as it is considered the safest among the type of flows.

FDI has been noted as being a key driver of economic growth and economic integration. It is characterized by its stability and size. The trajectory of flows in recent times has shifted from developed countries to emerging markets due to the large growth rate experienced in these economies. This is contrary to earlier profiling of such markets as being high risks markets. However, the notion has changed as emerging markets are now liberalized, this making them less risky to invest in. The FDI inflows moves to a particular sector over another as a result of government policies, global risk aversion, and the rate of investment in the sectors<sup>5</sup>.

Foreign portfolio investment (FPI) is different from foreign direct investment in that it does not seek controlling interest in a firm, but flows to maximize profits. Portfolio investment is the major source of capital inflows for industrialized economies. FPI inflow is more among developed countries due to investment strategies that investors pursue and also the market size of the host economies. Reduction in the activities of the domestic financial market creates incentives for greater capital inflows as it has a positive impact on FPI. Policy reform attracts more portfolio investment inflows through the creation of positive external ties and the provision of signaling effects from increasing financial development and commitment to further financial

reforms<sup>6</sup>.

Other financial investment (OFI) or private capital flows have kept flowing to emerging markets, but outflows have grown more, especially in the form of foreign reserves<sup>7</sup>. This type of flow is now persistently more volatile and is susceptible to external shocks and currency instability compared to the other types of capital inflow. Moreover, the exchange rate regime operated in the host economy may attract or repel this type of speculative capital<sup>2</sup>. OFI is important for countries classified as emerging markets<sup>8</sup>.

Policy reforms attract other financial investments such as private loans and cross-border flows as a result of growth in the domestic credits which outgrows the growth of deposits and as a result, facilitates the necessity to borrow from overseas to meet the shortage in supply of the domestic credit. In addition, policy reform also attracts more private loans if the cost of borrowing from the domestic market is higher than the cost of borrowing from overseas<sup>9</sup>. However, deregulation can also increase foreign private loans. Once deregulation of offshore borrowing has been affected, other financial investments through loans can increase through the removal of quantitative restrictions on overseas borrowing and provision of tax incentives; including the removal of reserve requirements, the removal of restrictions reduces transaction costs.

For all types of flows, information advantage or asymmetric affects all types of capital inflows significantly. Information asymmetric tends to favor FDI by removal of restrictions in certain sectors of the economy; capital inflows in form of FDI are higher. FPI is also affected significantly by information asymmetric, for as foreign investors get new information such as tax cuts in the various sectors of the economy, the inflow into the sectors of the economy in form of FPI is more compared to when such policy regarding openness did not exist. OFI is not left out as foreign investors or firms perceive relevant fundamentals better than domestic investors, thus,

direct flow into such sectors to exploit new opportunities<sup>10</sup>. More so, countries with more open trade and capital accounts, and better institutional quality are likely to experience large capital inflows<sup>11</sup>.

### **2.1.2 Sectoral Performance**

The sectoral performance refers to the level of output in ratio to change over a certain period. Existing literature failed to incorporate the performance of each sector, which in reality explains the pattern and determinants of capital inflows.

### **2.1.3 Push Factors**

The push factors refer to exogenous or global factors that affect inflows in an economy. Some factors have been identified and their importance varies across literature, however, a consensus has emerged that the United States monetary, supply of global liquidity (especially in US dollars), and global risk aversion help explain the changes in capital inflows<sup>11</sup>. Global factors are important as they affect capital inflows types as well as their volume into any sector of an economy. Experimentally, global investors rely on global factors which determine the size or amount of capital inflows any country expects to receive or lose<sup>3</sup>. This is however not true for all types of capital inflows as a study found that a combination of pull factors and global factors are responsible for large flows into an economy<sup>12</sup>.

### **2.1.4 Pull Factors**

Pull factors refer to the home country or are sometimes referred to as country-specific determinants that are perceived to affect capital inflows. The country-specific factors vary among countries of the world as vary across countries of the world. Generally, the pull factors are identified as the human capital in a country, macroeconomic features such as GDP, financial

openness, and the overall quality of institutions in the home country<sup>13</sup>.

### **2.1.5 Regional Factors**

Regionalism is a process that involves the elimination of restrictions to cross-border trade, investments, and financial operations by firms from countries in the same regional agreement. This may however be in addition to the harmonization of rules, regulations, and taxes between member countries. Regionalism is an important factor to countries that desires large capital inflows as it contributes to financial integration that results in more capital inflows<sup>14</sup>. It is argued that regionalism can promote increased foreign investment inflows because of the potential benefits from regional integration which include expanded trade links, reduced production costs associated with free movement of factors of production, improved market access, increased opportunities for risk-sharing, and diversification, and region-wide financial development. As countries that are active members of regional blocs or signatories to regional free trade agreements tend to attract more foreign investment flow<sup>15</sup>. The regional initiative can attract more foreign investments by producing benefits in terms of exploiting a wide-ranging scale economy, expanding trade links, and enhancing financial development across the region.

## 2.2 Review of Theories

### a. Pecking Order Theory

The theory was put forward by Donaldson in 1961 and modified by Myers and Majluf in 1984.<sup>4</sup>

The theory states that companies establish the precedence of their sources of finance (from internal financing to equity) according to the cost of financing and raises equity as a financing means of last resort. Therefore, internal funds are preferable to an organization and are first used until they are exhausted, the organization then issues debt, and when the cost of debt is high, equity is issued<sup>5</sup>. Pecking order theory starts with asymmetric information as managers are more knowledgeable of their company's prospects, risks, and value than outside investors. Asymmetric information affects choice regarding the use of internal or external financing and between the issue of debt or equity. So, the existence of pecking order for financing new projects arises<sup>6</sup>.

Asymmetric information supports the issue of debt over equity as the issue of debts indicates the board's confidence that investment turns out profitable and that the current stock price is undervalued (were stock price overvalued, the issue of equity is favored). Otherwise, once equity is issued it suggests a lack of confidence in the board and that they feel the share price is overvalued. Issuance of equity therefore results in a drop in share price. Although its assumptions do not hold for high-tech industries where issuance of equity is rather preferred as a result of the high cost of debt issued as assets are intangible<sup>7</sup>.

Since firms' finance comes from three sources, internal financing, debt, and new equity<sup>8</sup>. According to the theory, companies order their source of finance, preferring internal financing, then debt before (only as a last resort) equity. Firms usually ignore equity as a source of finance

because it brings foreign ownership into the firm and rather concentrate on other sources of finance. The major criticism of the theory is that it has not been able to prove that it is true of first-order importance in determining a firm's capital structure. Also, it has been criticized as it fails in areas where it should hold, especially for small firms where information asymmetry is presumed to be a problem<sup>9</sup>.

However, in support of the theory, there are some features of data regarding firms that are better explained by the pecking order theory<sup>10</sup>. However, there are only a few instances where the theory holds<sup>11</sup>. Literature proves that private firms follow the pecking order theory<sup>12</sup>. The fundamental assumption of pecking order theory is used as the bedrock of the thesis to achieve its objectives. The pecking order theory is applied with the sense that investors are preferential about the sectors of an economy they invest in. And futuristic profits, trends, and institutional quality attract capital inflows to the sectors. The theory is employed with a little twist, that investors rank sectors of the economy with a preference on the expected rate of return from the sector, while the yardstick is the sectoral performance.

The pecking order theory is the ground theory of this study, although with slight modifications. Primarily, the type of flow which the theory is used is basically for the FDI, however, this study still utilizes the assumptions of the theory for all the types of capital inflows. As the theory suggests that investors observe the organization's behavior, in this study, investors also monitor the sectors and classify them in a ratio of the risk levels, government policies, and interventions, use of technology for better output, and the sector's performance before channeling capital into the economy.

## **b. Modern Portfolio Theory**

The modern portfolio theory was first introduced by Harry Markowitz in his 1952 essay<sup>13</sup>. His works on the theory earned him a Nobel Prize in Economics<sup>14</sup>. The Modern Portfolio Theory (MPT) referred to in other literature as the mean-variance analysis, is a mathematical framework that arranges a portfolio of assets so that the expected return is efficiently maximized for a given level of risk. The theory proposes diversification of investments as it suggests that holding a different kind of asset reduces the level of risk compared to holding one type of asset.

The bedrock of the theory is that it postulates that an asset's (or group of assets') risk and return should not be evaluated by itself, but on the overall impact it has on the portfolio's overall risk and returns. The mean-variance analysis uses the variance of assets price as a proxy for risk<sup>15</sup>. Assumptions of the theory are crude as investors are expected to: purchase the assets with funds borrowed at a risk-free rate which suggests that investors are rational in their investment and are sensitive to the asset price movement in the markets portfolio value; it also assumes that returns on portfolio follow a Gaussian distribution, and; prices are not scalable. Like every theory, the MPT is not perfect as there are numerous criticisms against the theory. It is appreciated by critics for its theoretical importance, however, they still question if the theory is an ideal investment tool, for the model of financial markets it proposes does not reflect the real world in numerous ways<sup>16</sup>.

Another criticism is that the measures used by the MPT for the risk, return and correlation are based on expected values, which means that they are statistical statements about the future because the theory is explicit about the expected value of returns in its mathematical presentation but is implicit in its definitions of variance and covariance. Statistically, such a format does not

capture the true statistical features of the risk and return which oftentimes follows a highly skewed distribution that automatically gives rise to reduced volatility and an inflated growth of return<sup>17, 18</sup>.

In reality, investors will usually substitute prediction based on historical measurement of asset returns and volatility data for values in the equation. However, the expected values fail to take into account new circumstances that did not exist when the historical data was generated. Investors are however faced with the problem of estimating key parameters from past market data as a result of the position the MPT takes to model risk in terms of the likelihood of losses but does not give a reason why those losses may occur. Moreover, the risk measurements used are probabilistic and not structural.

The modern portfolio theory has also been criticized as it follows a Gaussian distribution. Research<sup>19 20</sup> has tried to show the inadequacies of this assumption and has proposed the use of more general stable distributions instead. Another criticism for the model based on the Gaussian distribution is that it is just an assumption-based model that quacks offer. However, there are contributions to the MPT built on Platonic models on a Gaussian base which contributes to the theory known as the Modern Portfolio Theory<sup>21</sup>.

### **c. Arbitrage Pricing Theory**

The theory was proposed by Stephen Ross in 1976<sup>22</sup>. It is regarded as a general theory of asset pricing that assumes that the expected return of financial assets can be modeled as a linear function of various factors which is subject to the sensitive changes in the factor that affects the price of an asset. The APT model is used to derive the asset's rate of return which will be used to price the asset correctly, of which the asset price should equal the expected end of the period

price discounted by the model.

Arbitrage is the act of taking an asset that has a positive expected return from overvalued or undervalued securities in an inefficient market without any incremental risk and zeroes additional investment to a closely similar or more efficient market to exchange for maximum profit. The APT states that if an asset's returns follow a factor structure, then the expected return of an asset is a function of the asset's sensitivities. However, there must be some certain requirements such as perfect competition in the market and the total number of factors must not exceed the total number of assets to avoid the problem of matrix singularity.

The model is not indispensable as it has criticisms towards its operations or efficiency. It is seen as a supply-side model as some of its coefficients reflect the underlying asset to economic factors. Therefore, factor shocks will cause structural changes in the assets' expected return, or in the case of stocks, in a firm's profitability, thus not reliable. More so, the selection of the factors used in the model is ambiguous. A study has used a varied number of factors, but the factors have been empirically deficient. The CAPM has been used to estimate the expected returns and has performed better than the advanced APT<sup>23</sup>.

#### **d. Gravity Theory**

The theory also referred to as the gravity model of international trade was first proposed by Walter in 1954<sup>24</sup>. Its traditional assumption poses that bilateral trade flows are rooted in the economic sizes of the countries and the distance between them. In support of the theories, literature shows that there exists ample evidence without reasonable doubt that trade tends to follow through with the distance between the countries in trade<sup>25</sup>. The model has been used by economists to analyze the determinants of bilateral trade flows such as common borders,

currencies, colonial legacies and has also been used to test the efficiency and effectiveness of trade agreements and treaties<sup>26</sup>.

Empirically, when the model is used, it gives tentative results as it accurately predicts trade flows between countries for a variety of goods and services but there existed not enough theoretical justification for the gravity equation<sup>27</sup>. However, a gravity relationship can arise in a trade model that includes trade costs that increase with distance. The gravity model estimates the pattern of international trade but its components compose of factors that enshrine determinants of international trade flow such as geography and spatiality. The model predicts that trade is based on relative factor abundances and it has been used to test purer economic theories of trade and has many models. A model that is based on the theory of relative factor abundance is the popular Heckscher-Ohlin model. Countries with a high abundance of a particular factor is expected to produce goods in large amounts derived from such factors in their production.

Nevertheless, the model has been criticized by one of the proponents that the world is not predictable and not sufficient to describe all trade as results are contrary to the theory of comparative advantage. A study showed that an opposite behavior occurred as the data studies showed that the rates of exporting more of a particular factor a country are endowed with; the behavior of the country is contrary to the theory of comparative advantage<sup>28</sup>. More so, other theories of trade have been proposed to explain the discrepancy of the theory and it is being referred to by economists as Leontief Paradox.

To complement the theory, an alternative was proposed by Linder. The theory predicts that patterns of trade will be determined by the total preferences of goods within countries<sup>29</sup>. It ultimately emphasizes that countries with similar preferences will develop similar industries. And with continued similar demand, these countries continue to trade in differentiated but similar

goods; since these countries both demand and produce similar goods<sup>30</sup>.

The Linder hypothesis still suffers setbacks as it is still viewed as empirically unclear. In support of the hypothesis, there is a significant impact of the Linder effect, but there is a report weaker result. However, empirical research that found weaker results used a different estimation price<sup>31</sup> as it was found that they only incorporated data of countries that trade and they also did not input zero values of the dyad where trade could happen but did not. These are possible explanations for their findings. Moreover, Linder did not present a formal model for his theory, research has tested the hypothesis in different ways.

Literature has also ruled out the notion that the theory of comparative advantage does not predict the relationships of the gravity model. The use of the gravity model showed that countries with similar levels of income tend to trade more<sup>32</sup>. Their evidence suggests that countries are trading in differentiating goods because of their similarities. This, therefore, cast some doubt about the impact of the Heckscher-Ohlin model has on the real world.

However, it is argued that the gravity model can be derived from the Heckscher-Ohlin model, Linder and Helpman-Krugman hypotheses<sup>33 34</sup>. But the fact many models can or are tied to the gravity model equation makes it not reliable for the evaluation of the empirical validity of theories. In an attempt to bridge the gap between economic theory and empirical tests, econometric models have been developed that are grounded in the theories of differentiated good, which measure the gains from trade liberalizations and the magnitude of the border barriers on trade<sup>35 36</sup>. Supporting this, a recent study shows that in using the gravity equations the effect of borders is relatively modest<sup>37</sup>.

The bridging economic theory with empirical results is still insufficient as it is argued that the

possibility of intra-industry trade does not exist as a result of differentiated goods, but because of “reciprocal dumping”. The models imply that countries involved in the trade have in their domestic markets imperfect competitions and segmented markets in homogeneous goods, which leads to intra-industry trade as firms in imperfect competition seek to expand their markets to other countries and thereby trade goods that are not differentiated yet for which they do not have a comparative advantage since there is no specialization. However, this model is consistent with the gravity model predicts that trade depends on country size.

Interestingly, the reciprocal dumping model has held up to some empirical testing as it emphasizes specialization and differentiated goods models but it might not fully explain the gravity equation<sup>38</sup>. However, evaluating the home market effect in separate gravity models for differentiated and homogeneous goods has provided evidence to support the claim. The results show that the home market effect showed a relationship in the gravity estimation for differentiated goods, but showed the inverse relationship for homogeneous goods. The results match with the predictions of the theory of reciprocal dumping as playing a vital role in homogeneous markets.

Finally, in the use of the gravity model, there has been an attempt to evaluate the impact of various variables by modifying the gravity equation. Among these, exchange rate and price level variables have been shown to have a relationship with the gravity model which accounts for an important amount of the variance not expatiated upon by the basic gravity equation.

### 2.3 Empirical Review

Papers relating to capital flows are grouped into two segments, that is, the movement pattern and flows determinants. There are papers that have considered the both segments individually but less works have been done with both aspects in focus. This could be as a result of vast empirical works on both segments. However, the review of existing literature in line with the objectives are presented.

Earlier works on the sectoral inflow of capital into the Nigerian economy have pointed out that from the period 1970 to 1998, the behavior of transnational firms in their investment pattern focused on certain sectors with a similar line of business as theirs<sup>39 40</sup>. However, it has been noted that if capital inflows are sectoral by nature, inequality is reduced more than the levels they are in the country because capital inflows to the sector- in this case, the agricultural sector results in mass production and the agro-based chain benefits<sup>41</sup>. It may however not be the reality as capital inflows are sectoral by nature but dependent on many factors broadly characterized into push and pull factors. The finding however forgot to incorporate the fact that investors are different, so therefore suggestion cannot stand as many other behavioral characteristics as well as exogenous factors that affect flows were not incorporated in the findings.

Another paper focusing on the manufacturing sector of the Nigerian economy established in their analysis that there is a threshold of the amount of capital inflow that amounts to economic growth. It found that about twenty five percent (25%) is the optimal point of capital inflows for economic growth and any level above this sustainable level will affect economic growth negatively in Nigeria but also added that there is no capital inflows threshold point for the manufacturing sector (exports) and therefore recommends that excessive capital inflows should be avoided in the country <sup>42</sup>.

As capital inflows are being directed into sectors with natural resources, it was found that the type of flow such as FDI is sectoral<sup>43</sup>. The reason(s) why some types of capital inflows flow into certain sectors more than others (especially putting push and pull factors in context) remain unanswered. However, it has been argued that capital inflows may be attracted to certain areas as a result of natural resources, market size, government policies, institutional and political factors<sup>44</sup> but this is rarely true as opposing literature points out that not all types of capital inflows are affected by these and not all flows are categorically steady.

Recent papers of capital inflows on Emerging markets can be generalized into two categories. One focuses on the impact of capital inflows on general income level or bridging the poverty gap and the other focused on the GDP growth of emerging markets economies as a result of capital inflows. In Nigeria, capital inflows have shown sectoral characteristics but factors that facilitate or mitigate capital inflows into the sectors of the economy remain less researched. The analysis of the sectors of the Nigerian economy sheds light on the pattern and determinant of capital inflows into the different sectors and contributes to existing literature. The anchor theory on which the study is modeled upon is the pecking order theory.

### **2.3.1 Pattern of Capital Inflows**

The pattern of capital inflows refers to the observed way flows have been seen to move. Three decades ago, flows were seen to flow more to Latin America and Asia but a different pattern has been observed. However, flows are now seen to be more in Africa despite the lack of quality financial institutions and other prominent factors. Data also shows that the European sovereign debt crisis may have caused a larger decline in inflows to Africa than the global financial crisis. As a result, flows into industrial countries and emerging countries experienced a sharp decline

after the global financial crisis. In the case of SSA, it was the 2011-12 European debt crises that hit the region harder. The major components of capital inflows for SSA are Foreign Direct Investment (FDI), foreign aid, and remittance inflows. For instance, during the period 2000-17, FDI represented on average 3.4 percent of GDP while foreign aid and remittances amounted to 3.3 and 2.3 percent of GDP<sup>45, 46</sup>.

Moreover, while focusing on the drivers of capital flows into an economy, there exists argument that flows vary by type of flow and regions. The baseline regression analysis (instrumental variables estimation with panel data) estimates total gross capital inflows, FDI, portfolio investments, and other investments on a series of pull and push factors for 136 countries from 1980 to 2017. Summarily, domestic factors play a greater role in attracting gross capital inflows than external factors although both factors are important. Investment profile (as a proxy of the quality of institutions) and financial openness have a robust and positive impact on all the different types of gross inflows<sup>47</sup>. For example, a one-point increase in investment profile and financial openness leads to an increase in total gross inflows respectively. Domestic economic growth has a positive and significant influence on total gross inflows and FDI inflows while it has a positive but non-significant relationship with gross portfolio investment (PI) and other investment (OFI) inflows. For instance, if economic growth increases, it is expected that total inflows increase and FDI inflows increase too. Trade openness and all types of flows (such as total inflows, FDI, PI, and OI) are negatively associated but their impact is not statistically significant. A higher rate of CPI inflation induces more total gross inflows, FDI, and PI inflows.

Another baseline regression is estimated for emerging markets shows a smaller number of variables that play a role in driving capital flows into the region. Results suggest that domestic

factors are more important in driving FDI inflows to emerging Africa while external factors are more important in driving PI and OI inflows. Indeed, the relationship between gross capital inflows and their drivers across emerging African countries has been found to behave similarly to that of natural resource-abundant countries. Therefore, different sets of regressions are estimated for African countries, with few drivers (mostly, push factors) having a significant impact<sup>48</sup>.

Analysis of capital inflows and drivers of these flows is important because surges in capital flows have real effects on the economy. Flows of foreign capital may have long-term effects on growth. For example, show that surges in portfolio investment inflows hurt growth in the manufacturing sector<sup>49</sup>. Notwithstanding, surges in FDI inflows have a positive impact on aggregate manufacturing growth. Also, there is an impact on total factor productivity (TFP) growth (rather than investment) through the credit channel<sup>50</sup>.

On the other hand, capital flows may have destabilizing effects on domestic financial markets. For instance, a credit boom that ends up in a financial crisis in the domestic economy is typically preceded by surges in gross inflows (and, more specifically, surges in cross-border banking inflows). Another string of literature argues that it can also lead to greater volatility and a higher incidence of the financial crisis<sup>51</sup>. In this case, implementing policies that decouple capital inflows and credit expansions will help manage systemic risks. Massive capital inflows can lead to credit build-up and asset price booms may also end up in a systemic banking crisis<sup>52 53</sup>. Moreover, it has been suggested that credit booms can be typically the outcome of surges in

private capital inflows<sup>54 55</sup>. In addition, there exists the possibility that any (even a little) rapid increase in banking leverage typically has antedated periods of financial instability and crisis<sup>56 57</sup>.

Policy recommendations arising from numerous analyses underscore those emerging countries need to diversify the economic and export structure, develop deeper domestic financial markets, implement policies to promote a productive business environment, focus and revamp existing sectors, create investment opportunities and ultimately create other (newer) sectors that attracts capital inflows.

Additionally, capital inflow behavior for Nigeria is different from that of industrial countries due to different economic structures which render different transmission processes. External factors are the main drivers of gross capital inflows into emerging Africa, while both domestic and external factors are important for industrial countries. FDI dominates the total flows into Nigeria but portfolio and other flows have also increased over time and it also births more problems for policymakers who have to deal with the instability. Interestingly, capital inflows into emerging markets have been characterized as very high since 2009. In emerging markets, push factors do not affect FDI. Moreover, evidence exists that whenever the global risk aversion increases, FPI and OFI inflows are generally affected by it but the FDI is not<sup>58</sup>.

Empirical research has focused on the causes of capital flows to Emerging markets of which low-interest rates in developed countries have pushed FDI to emerging markets. And there exists vast literature focusing on the numerous factors that could affect the volume, composition, and dynamic behavior of capital inflows to emerging markets. Another vast research work has focused on the economic impact of FDI flows in recipient countries, the benefits as well as demerits, financial stability, and numerous risks associated with a sudden reversal of flows<sup>59 60 61</sup>.

In the sectors of the economy that have attracted flows, the pattern of flows has noted that the manufacturing sector attracted large inflows<sup>62</sup>. This was the case of emerging China as many difficulties were encountered as flows did not meet the expectation for economic reforms. The obstacles faced could be a result of the lack of clearly defining the legal environment for foreign investors, lack of communications and transport infrastructure developments, and shortage of skilled labour<sup>63</sup>. At the sectoral level in emerging China's case, domestic market size (GDP), the labour wage, innovation activities, and degree of economic reform encourage inward foreign direct investments.

Looking into policies that could attract capital inflows in Africa, there are several impediments to policies and they include political instability and policy uncertainty. Since policy to attract capital inflows are largely pull factors that aim to reform economic and political structures that boost confidence in the economy, reforms such as debt restructuring which ease the long-run foreign exchange constraint and therefore enhance the sustainability of foreign exchange inflows, liberalization of foreign exchange flows (both current and capital) in the balance of payments, simplification of red-tape requirements for direct and portfolio investment, and liberalization of restrictions on private sector borrowing from abroad. When policies are structural and purposeful, FDI flows are seen to be higher compared to other types of capital inflows as investors are pampered by the carrot offered by the country and are not hurt by the stick<sup>64</sup>.

Policies does not affect the capital inflow type without consequences. Capital inflows supply the needed capital the country could not generate but it is usually negatively accompanied by large tax cuts, foreign dominance of certain establishments or worse, certain sectors<sup>65</sup>. Moreover, if the government tries to restrict a type of capital inflow using policies, it may in turn repel other types of capital inflow into the sector. The Nigerian "Indigenization Act 1972" a modification of the

“The Nigerian Enterprises Promotion Decree”<sup>66</sup> that restricts foreigners from doing some type of business is a perfect example. Those sectors that are not allowed to be invested in especially services are capital impoverished compared to those that are not. Whilst investigating the relationship between the capital inflow type, FDI, and growth using India as a case study found that FDI does not impact growth at the sectoral level but growth has an impact on FDI. The case of Nigeria is contrary, as a negative relationship between FDI and growth in the short-run exists but a positive relationship in long run<sup>67</sup>.

### **2.3.2 Determinants of Capital Inflows**

The distinction of country-specific “pull” factors and external “push” factors of capital inflows was introduced in 1993<sup>68, 69</sup>. It eventually became the basic analytical framework for any empirical analysis of drivers of capital inflows to emerging markets and developing economies as a result of global financial integration and strong growth prospects observed in these countries<sup>70</sup>. In focus on the stability of flows to developing countries it has been argued that global capital flows can have a destabilizing role in developing countries especially when financial crises cause a sudden reversal of such flows<sup>71</sup>. Policymakers in emerging markets are still puzzled by the extreme fluctuations in capital flows. A sudden surge in capital inflow (whatever type of flow) puts pressure on the domestic currency to appreciate (which is akin to the Dutch disease) which in turn hurts the country’s net exports performance. Similarly, a sudden stop of capital inflow of capital causes the domestic currency to depreciate and often results in inflation<sup>72</sup>.

The great recession has made policymakers and academia focus on the pattern and determinants of capital flows as the recession resulted in zero interest in developed countries and investors had

to find new markets for their capital. This has resulted in flows into emerging countries. It has been argued that the global financial cycle affects largely the capital flows, assets prices and credit growth<sup>73</sup>. More so, high or extreme flows in capital driven by global factors can disrupt macroeconomic stability as it negatively inflates domestic assets' prices resulting in inefficient credit creation in recipient countries irrespective of the current domestic conditions.

The problem of volatility is still of concern as the last decade recorded an increase in capital flow volatility and this poses a problem for many economies<sup>74</sup>. These problems could include economic cycles being amplified by large capital flow increases and decreases, increased financial vulnerabilities, and exacerbated macroeconomic instability<sup>75, 76, 77</sup>. The surge in capital inflow could result in domestic financial market failure and mitigate the ability of macroeconomic policies' ability to adjust through exchange rate appreciation, asset price bubbles, money market distortions, credit boom, and creating unsustainable risk premium drops especially as a result of the market size of the domestic economy to handle such large inflow. Nevertheless, the IMF has deviated from her traditional view of regulative flows to subscribing to it by proposing the "institutional view" on capital account liberalization and management of capital flows. The IMF has now pointed out that regulation of flows is paramount in certain circumstances<sup>78</sup>.

Data shows that flows to emerging markets are however majorly FDI, Nevertheless, new data shows that portfolio equity and bank-related flows to emerging markets are increasing drastically<sup>79</sup>. Policymakers are still puzzled by the nature and causes for different types of flows and how to acquire them. Issues relating to determinants of capital flows begs the question are global and domestic factors the main determinants of capital flows and which of the two factors are dominant? Notwithstanding, existing literature identifies global factors<sup>80, 81</sup> and domestic

factors as determinants of flows. No one has pointed to one as a tie-breaker as they are both equally important as both are essentially needed in any economy; especially in emerging markets. Some literature has however shown preference in one of the two factors<sup>82, 83, & 84</sup>.

Literature on determinants of capital flows has identified the push-pull framework as the determinant of capital inflows, introduced in 1993 and popularized in 1996. The framework has been used to explain the behavior of flows during and after global financial crises. The push factors refer to the global factors that determine capital flows while pull factors refer to country-specific characteristics that attract flows<sup>85</sup>. Push factors that determine capital flows are global financial liquidity, global risk aversion, portfolio diversification, and financial openness. The question that some countries receive more flows than others remain unanswered as it is argued that financial openness should automatically encourage flows into a country but it is not so as other underlying factors exist that play a major role in determining flows. The importance of global risk aversion in determining capital flows into an economy has been noted that whenever there is high global uncertainty; investors are discouraged due to high-risk projections and fear of loss of investment<sup>86, 87</sup>.

Pull or home country determinants of flows vary across countries and have equally had much paper on it. The quality of institutions in the country is a major determinant of capital inflows as empirical paper found it to be significant for capital inflows<sup>88</sup>. It has been argued that human capital can eliminate the difference in marginal rates of return to capital across countries that only occurs if human capital spillovers are internalized within a country. On the contrary, it is argued that capital flows are heavily dependent on the quality of institutions that exists since economic returns from investing in a country may be dependent on the institutional quality arrangement<sup>89</sup>. This claim is supported by other scholars who argue that institutional quality

explains the Lucas Paradox<sup>90, 91</sup>. Even so, the measure of human capital development is not a statistically significant determinant of capital flows<sup>92</sup>.

Withal, financial openness has been argued to birth volatility in inflows. FPI is seen to be volatile and financial openness encourages it as it fosters discouragement investment when investors sense risks in a particular environment. Although it is argued that FDI is volatile while others have found it to be least volatile<sup>93</sup>, this rationale however is due to its large size as well as the sudden shock and ultimately stops that are associated with this kind of flow. Aside from this, FDI is relatively stable. Results vary on the impact of financial openness on the type of flows. Empirically, financial openness increased the volatility of FDI inflows while decreasing that of FPI. But an exemption of emerging markets should be noted that as they ease capital movements, flows may become subject to sudden surges, stops, or reversals<sup>94</sup>. It was found that between 2007 and 2016, about 31% of FDI flows into the extractive sector amounting to. This still supports the claim that FDI is sectoral and primarily targets natural resources<sup>95</sup>.

Volatility in emerging countries is agreed to be high and it is assumed that the rapid reversals of capital flows have negative economic consequences<sup>96</sup>. Moreover, using a rolling window to test the co-movement of capital flows volatility, found that capital flows volatility has many commonalities across countries and that the main determinants of capital flows are determined by commodity prices and long-run USA interest rates as a result of a fall in returns in long-run returns in bonds which made investors direct funds to emerge economies<sup>97</sup>. Yet, it is argued that there is a negative link between real commodity prices and interest rates<sup>98, 99</sup>. Nevertheless, economic growth (projection), real commodity prices as well as interest rates in the USA are determined by global determinants of capital flows<sup>100</sup>. More so, the determinant of the volatility of capital inflows to emerging markets is dependent on real prices and long-run US interest rates.

So, whenever rates fall, investors look for an alternative, higher, or more risky rates of return elsewhere<sup>101</sup>.

Policymakers are selective for the type of inflows as each flow comes with different benefits that is, short-run or long-run benefits. Many countries sought FDI because of the large and positive characteristics associated with it<sup>102 & 103</sup>. Moreover, FDI has been seen to foster technology spillovers, global trade integration, research and development, enhancement of a more competitive business environment, and better management techniques<sup>104</sup>. But FPI is strong to strong financial markets as it helps domestic companies have access to the limited financial resources. Literature finds that, unlike FPI, FDI is affected by the institutional quality<sup>105</sup> and its volatility may be as a result of political and economic uncertainty in a country<sup>106</sup>. For instance, India initiated relaxation of restrictions which led to a surge in net capital inflows from 95.09 billion rupees in 1991-1992 to 401.6 billion rupees in 2001-2002<sup>107</sup>. Financial openness is argued to attract flows.<sup>108, 109, 110 & 111</sup> But all flows are not affected equally by financial openness. FDI is seen to be not affected by financial openness but FPI and OFI are greatly affected by financial openness.

Research shows that the connection between world market integration and capital inflows found that the push factors important in determining flows has increased drastically while pull factors importance has been reduced<sup>112 & 113</sup>. Since the global crisis in 2008-2009 which resulted in the reversal of global capital flows has sparked up debate about the push factor in determining flows.

The cyclicity and pro-cyclicity of flows have also been subject to debate as flows are by nature counter-cyclical as they cushion domestic business cycle conditions<sup>114 & 115</sup>. Be that as it may, in emerging markets, capital flows are seen to be pro-cyclical because during an economic

boom there is a surge but in recession, there is a reversal. Cyclicity of flows tends to amplify the boom-bust cycles in developing countries<sup>116</sup>. When flows become pro-cyclical, they prevent an economy from enjoying the various benefits of liberalization and capital account openness<sup>117</sup>.

FDI and FPI are cyclical, thus, the cyclicity of FDI is however related to its sluggishness due to its size. All the same, flows of FPI were not a result of real factors but as a result of market sentiments<sup>118, 119 & 120</sup>. FPI and FDI can occur separately and together. When there is an outright sale of a company by foreign investors, it could be associated with the two types of flows. Push factors is the most for portfolio flows and least for FDI. Emerging economies benefit largely from low-interest rates in advanced economies as flows are directed to them specifically its bond market. Capital inflows, however, possess negative sides including their effects on productivity, which is core to economic transformation<sup>121</sup>, so policymakers usually take a cautious approach to it and an examination of sector-specific effects is however necessary. The effect of capital inflows on the real exchange rate can be compared to the 'Dutch disease phenomenon. Beyond effects on the exchange rate, remittances might have negative effects on growth, for example, via brain drain and over-consumption of remitted funds.

Since investors theoretically invest in economies with high rates of returns and these capital inflows are higher in some sectors in an economy more than others, it shows the importance to analyze inflows to particular sectors that therefore suggest the pattern and determinants of flows are sectors preferential to an economy. Papers on determinants of capital flows have largely focused on the impact of flows on recipient countries, including the benefits of capital flows such as higher investment and growth. Investigation on how policy issues such as capital controls can affect the volume of inflows is a trend<sup>122 & 123</sup>.

Focusing on the positive and negative effects of capital inflows by type, a study found that the positive effect of FDI is the stability of GDP, increased purchasing power parity, increased tax revenue, and increased research and development expenditure. The negative effects of FDI were dependency on foreign capital and high CO<sup>2</sup> emission. The positive effect of FDI is agreed to be so by other researchers but the negative effects, particularly the surge in CO<sup>2</sup> emission is not entirely true as the paper argues that through FDI, CO<sup>2</sup> emission has increased. Emerging markets that gain large revenues from a particular sector such as oil will continue to experience high CO<sup>2</sup> emissions in those sectors due to continuous exploration and exploitation of such resources not necessarily with the inflow of FDI but will source for other means of capital like internal generated or most likely privatize the sector to ensure the continuous benefits from exploration and exploitation. Also, not all FDI flow into sectors of an economy results in CO<sup>2</sup> emission like the agricultural and tourism sectors<sup>124</sup>.

Literature found that domestic output growth most likely refers to the performance of the individual sectors within an economy<sup>125, 126 & 127</sup>. Policy issues have been found to lead to a surge of capital inflow and are dependent on if flows are push or pull driven. The research found that domestic fundamentals are the key drivers of flows<sup>128, 129 & 130</sup>. The findings are based on the theoretical model of inter-temporal current account determination whose predictions were consistent with predictions. Literature investigating the drivers of flows into an individual country or region as well as the type of flow has different results. With panel data with a country fixed effect for 9 emerging markets divided into two regions, it was found that push factors were more likely to affect portfolio flows into Asian and Latin American economies<sup>131</sup>. Also, using a more complex model it was found that for 5 economies, the emerging market's productivity was more important for FDI flows than portfolio flows<sup>132</sup>. For the specific types of flows into a particular country or region, FDI has been the most focused on from the 1990s to mid-2000s as

the annual flow of capital to emerging markets was over \$300 billion<sup>133</sup>.

Literature found that push factors are dominant drivers of portfolio flows during the global financial crisis but after the financial crisis portfolio investment responded more strongly to pull factors such as macroeconomic fundamentals, institutions, and policies of recipient countries. Although, a different study carried out four that pull factors are more important when risk aversion is increased as generates panic for investors within an economy as local policies initiated plays only a small role in shaping flows. For other financial investment, push factors to affect it only in economies such as Nigeria where US long rates dominate. Risk is also important for capital inflows, particularly for OFI<sup>134</sup>.

It is argued that when computing results for flows, the type of flows is important to give the true reality of flows. The differences between net flows and gross flows have been cited in several papers and when and how they should be used has also been cited. Net flows show the current account balance (adjusted for changes in reserves, capital transfers, and errors and omissions) and by so, a deficit in the current account is showed positive in the net capital flows. While, gross capital flows comprise of outward investment and foreign inward investment such as international borrowing, lending, and financial inter-mediation which are captured as gross capitalflows.

Countries with a high-rate of returns receives net capital flows from foreign investors to finance investment until their rate of returns equals the world's rate of return that is, investors exploits the high rates of returns in a developing country until the rate of return is equal to anywhere else in the world<sup>135</sup>. The stability of the emerging markets is important as specific capital inflows make economic growth more stable and less volatile<sup>136</sup>.

## 2.4 Methodological Review

Capital inflows to emerging economies have historically mainly comprised largely of foreign direct investments and short-term inflows such as portfolio investments and other financial investments<sup>137</sup>. In analyses, methodology used across research in the pattern and determinants of capital inflows has varied widely. The literature on the pattern and determinants of capital inflows to emerging markets are voluminous and the methodologies used are not in oneness. A paper analyzing the push factors and capital flows to emerging markets, utilized quarterly data from 2001-2015, specifically, the type of data employed was gross capital inflows. Another study was based on a sample of 46 emerging markets and 20 frontier markets of which a panel study was utilized<sup>138</sup>. Annual data of some countries within the Sub-Saharan Africa region were analyzed for a period of 30years, between the period from 1980-2009.

Sources of data for works include the World Bank, IMF, country/countries monetary authority statistical bulletin, CEIC<sup>139 &140</sup>. The data set has been country, set of countries, and combination of countries across regions and continents. Across different papers, models have been modified or newer ones created which are used in the analysis of data<sup>141</sup>. The estimation technique used in existing literature varies as there is no standard test of estimation of capital inflows. Existing literature has proceeded with the creation of a model to suit their analysis. However, there are common testing econometric tools employed in the existing literature such as unit-truth test, ordinary least square, and extensively employed regression analysis and models<sup>142</sup>. The models employed in existing literature consist of push, pull, and regional factors (or their properties) that affect capital inflows.

It is important to state that the models used in analysis are left to the discretion of the authors, however, there is a similarity in the methods to which the models are employed. The most

significant trend in the models as relating to the determinant of capital inflows is the presence of the pull and push factors in the equation. A study employed the multinomial logistic model which was used to evaluate the surge and reversals of capital inflows as against normal flow. The model was designed as a surge or reversal of capital inflows as a function of global push and domestic pull factors. Another paper focusing on the determinants of foreign capital flows incorporated regional factors in their estimation and carried out a panel study with cross-sectional effects for the countries<sup>143</sup>. Developing countries were brought into perspective as the pattern of capital inflows as well as the implication of such flows into such economies was evaluated using the neoclassical growth model and a Cobb-Douglas type of production function. A paper also used the Bayesian Model Averaging approach which gave very interesting results<sup>144, 145</sup>.

## **2.5 Conceptual and Theoretical Framework**

The conceptual and theoretical framework suggests that capital inflows and sectoral performance are co-dependent, that is, they depend on each other. The framework is built on existing literature that argues differently about the factors that affect capital inflows. The trend in literature identifies pull factors that are country-specific; push factors which refer to the global factors; and regional factors which are associated with the country's membership in regional blocs. Capital inflows are dependent on the push factor and regional factors directly, but the pull factor that attracts capital flows is anchored on the performance of the sector, as capital inflows will not flow into the economy without the signal of a positive, profit yielding performing sector of the economy. The sectoral performance is affected by pull factors which could be government policies and capital inflows which are dependent on push and regional factors that affect capital inflows.

However, since no literature has focused on the sectoral performance which affects capital inflows it is therefore important to put it into the analysis. It should be noted that the sectoral performance is country-specific, hence a pull factor that affects capital flows, because a good- performing sector will attract the attention of foreign investors who intend to satisfy their risk appetite . Nevertheless, the success of the sectors is dependent on the number of capital inflows it acquires, hence its push factors. More so, participation of a country actively in regional blocs such as being signatory to free trade agreement, and adaptation of the regional policies that have facilitated capital inflows to other countries within the region allows the country to attract some in form of spill-over.

The two-gap model suggests that developing economies are faced with a savings gap. As external capital is needed to augment the domestic capital, the economy is dependent on the capital inflows to the different sectors that make up the economy but the sector has to show positive signs of growth which is referred to as its performance. The sector's performance thus is dependent on the number of capital inflows to the sectors which increases the performance and output of the sector<sup>147</sup>.

The two-gap model promotes the idea that capital inflows are necessary to augment the savings and foreign exchange constraint. The two-gap model is in line with the neoclassical growth theory as it promotes the need for capital inflow into economies where it can achieve the marginal product. When the recipient count economy begins to receive the capital inflow, there begins to be growing as new technology acquired enhances productivity, stimulate growth and development. It should be noted that development only occurs when two or more sectors are efficient, thus, capital inflows do not go to the overall economy but a fragment of it called sectors that collectively make up the sector<sup>148</sup>.

As domestic investment is utilized in the sectors it becomes necessary that when it is exhausted, other alternative sources of capital are sort for. Invariably, the sector needs capital inflow to bridge the gap between savings and investment in the economy. It is argued that domestic investment and capital inflows affect the economy differently. In the long run, domestic investment affects growth negatively, and thus, there will be a need for capital inflows to boost the economy. Nevertheless, In the short run, domestic investment affects the economy positively, although, results could be vice-versa<sup>149</sup>. Capital inflows to the sectors of the economy can be negative and positive- negative as it leads to the appreciation of the local currency and thus affects the competitiveness of the export of the recipient country; and positive as it influences the growth of the recipient country<sup>150</sup>.

Nevertheless, it remains necessary to evaluate the performance of each sector that garners capital inflows as external capital is needed to augment the domestic capital. The sector is dependent on capital inflows, however, there must exist an underling advantage that makes the sector successfully attract capital flows. This factor is referred to here as sectoral performance. When sectoral performance is favorable, there would be a surge of capital inflow in the respective sector. This is constant with theory, as capital should flow to regions with the high marginal products. More so, it is dependent on other variables that plummets capital inflows generally referred to as pull factors, such as financial openness, interest rate, stability, etc. Sectoral performance is also affected by other pull factors such as government policies, tax cuts, rate of return, and institutional quality. The pull factors have a direct impact on the sectoral performance, but this does not hold for all sectors, as some of the pull factors affect a particular sector more than another. Take for example the banking sector, capital inflows are more attracted to the

financial sector, especially when the bonds and treasury bills have high rates of interest compared to other sectors.

$$SP = f \{CI, PL\}$$

2.1

Where;  $SP$  represents Sectoral Performance,  $CI$  represents Capital inflows,  $PL$  represents pull factors, while  $f$  is the functional relationship between the dependent and independent variables.

The sectoral capital inflows are dependent on the performance of the sector and future opportunities the sector offers, therefore, as the sector's performance continues to increase it attracts more capital inflows. More and more capital flows are sure to flow as capital seeks wherever there is an expected yield in returns. Sectoral capital inflows are affected by global push factors such as global risk aversion, US dollar liquidity, and global financial cycle.<sup>151</sup> Be as it may be, the push factors do not affect the sectoral performance but the sectoral performance is not directly affected by the sectoral capital inflows. Regional factors also affect the sectoral capital inflows directly in terms of spillover as a result of a country being a participating member in regional treaties and policies. The regional factor directly affects the sectoral capital inflows which affect the sectoral performance. Thus, the pull factors are the only variables that affect both sectoral performance and sectoral capital inflows.

$$CI = f \{SP, PL, PS, RG\}$$

2.2

Where;  $CI$  represents Capital inflows,  $SP$  represents Sectoral Performance,  $PL$  represents pull factors,  $PS$  represents push factors, while  $f$  is the functional relationship between the dependent and independent variables.

## **2.6 Summary of Literature Reviewed**

The general notion of capital inflows into sectors have been for the diversification of foreign investors' portfolio, minimization of risks, and ultimately maximization of profits. Capital inflows however have been significant to the recipient economy as it eventually facilitate the growth of the economy. However, the sectors which attract these flows have been under-researched. Research on the sectoral analysis of flows has focused on one sector in their analyses- banking, mining, and agricultural sectors. Existing literature also focused on one type of flow- FDI<sup>146</sup>. These are not sufficient to determine the pattern and determinants of flows into the various sectors. More so, the sectors' performance has also been ignored. This study fills that gap by investigating how the sectors' performance affects capital inflows.

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## Chapter Three

### Methodology

The study's two objectives include explaining how sectoral performance led to capital inflows to the sector, and; examining the pull and push factors that determine capital inflow across sectors in Nigeria. In the analysis of data on the different objectives, it is expected that the pattern of capital inflows should be sectoral, that is, capital inflows select certain sectors of the economy. For objective one, the estimated model show that sectoral performance is ab major criterion for capitalinflows.

#### 3.1 Model Specification

The model specification is drawn out of the two gap model with assumptions of the pecking order theory and conceptualization that is grounded on literature that has shown the determinants of capital inflows as well as a variable included to be tested for that is, sectoral performance.

##### 3.1.1 Examines the pull and push factors that determine capital inflow across sectors in Nigeria

To achieve objective two which is to examine the pull and push factors that determine capital inflows across sectors in Nigeria. The model used is adapted in part from exiting literature, taking in part the type of variables used as well as the type of data utilized, and estimation techniques.

The peculiarity of this model is the introduction of the sectoral performance as a stand alone variable with other chosen regressors of the pull and push factors of which the basis of choice was owing to the availability of data<sup>1,2,3</sup>. The model is specified as thus:

$$CI = \alpha_0 + \beta_1 SP + \delta_2 GDP + \delta_3 Infr + \delta_4 FOp + \delta_5 Exr + \Phi_6 USDr + \Phi_7 GFC$$

The model to be estimated is drawn down for each of the five sectors are shown below:

$$AgricCI = f(Agricp, Gdp, Infr, Fop, Exr, Usdr, Gfc) \dots \text{equ.vi}$$

$$FinCI = f(Fincp, Gdp, Infr, Fop, Exr, Usdr, Gfc) \dots \text{equ.vii}$$

$$IndCI = f(Indp, Gdp, Infr, Fop, Exr, Usdr, Gfc) \dots \text{equ.viii}$$

$$SevCI = f(Sevp, Ggdp, Infr, Fop, Exr, Usdr, Gfc) \dots \text{equ.ix}$$

$$ShrCI = f(Shrp, Gdp, Infr, Fop, Exr, Usdr, Gfc) \dots \text{equ.x}$$

In the model, *GFC* and sectoral performance were used as fixed regressors. *GFC* was used as a result of being identified in the literature as a dominant exogenous variable that affects capital inflows. However, the use of sectoral performance as fixed regressors is based on the author's conceptual framework that sectoral performance increases the chances of capital inflows.

Where: *CI* represents Capital inflows, and the pull factors identified in literature where *Ggdp* represents the gross domestic product, *Intr* represents domestic interest rates, *Infr* represents inflation rates, *TOp* represents trade openness, *FOP* represents financial openness and *Gef* represents government efficiency, *Exr* represents exchange rates, *USD* represents United states interest rates and *GFC* represents the global financial cycle.

### **3.1.2 Explain How Sectoral Performance Leads to Capital Inflows to the Sector**

To achieve objective one that is, to explain how sectoral performance led to capital inflows to the sector, a model is drawn up from equations 2.2 and 2.3 presented in the literature review. This is derived from the conceptual framework: capital inflows are affected directly by the sectoral performance, pull, push, and regional factors. However, sectoral performances are affected by

capital inflows and pull factors. The pull and push factors are shown by their sub-variables. In this study, however, the pull factors to be used are the growth in GDP, interest rate, inflation rate, trade openness, financial openness, and government efficiency. While the push factors to be used in this study includes the exchange rate, US dollar interest rate, and global financial cycle. Since the dependent variables are also functions of other dependent variables a simultaneous equation is carried out<sup>4 & 5</sup>. The model is therefore presented as thus:

$$SP = \alpha_0 + \beta_1 CI + \delta_2 GDP + \delta_3 Infr + \delta_4 FOp + \delta_5 Exr$$

$$CI = \alpha_0 + \beta_1 SP + \delta_2 GDP + \delta_3 Infr + \delta_4 FOp + \delta_5 Exr + \Phi_6 USDr + \Phi_7 GFC$$

3.2

Where; *SP* represents Sectoral Performance, *CI* represents Capital inflows, and the pull factors identified in literature where *Gdp* represents the gross domestic product, *Infr* represents inflation rates, and *FOp* represents financial openness, *Exr* represents exchange rates, *USDr* represents the United states interest rates and *GFC* represents the global financial cycle.

The individual variables are lagged to fit into the model specifications. Model to be estimated is drawn down for each of the five sectors are shown below:

$$lAgricp = f(lAgricCI, lGgdp, lInfr, lFop, lExr)$$

$$lAgricCI = f(lAgricp, lGgdp, lInfr, lFop, lExr, lUsdr, lGfc)... \text{equ.i}$$

$$lFinp = f(lFinCI, lGgdp, lInfr, lFop, lExr)$$

$$lFinCI = f(lFinp, lGgdp, lInfr, lFop, lExr, lUsdr, lGfc)... \text{equ.ii}$$

$$lIndp = f(lIndCI, lGgdp, lInfr, lFop, lExr)$$

$$lIndCI = f(lIndp, lGgdp, lInfr, lFop, lExr, lUsdr, lGfc) \dots \text{equ.iii}$$

$$lSevp = f(lSevCI, lGgdp, lInfr, lFop, lExr)$$

$$lSevCI = f(lSevp, lGgdp, lInfr, lFop, lExr, lUsdr, lGfc) \dots \text{equ.iv}$$

$$lShrp = f(lShrCI, lGgdp, lInfr, lFop, lExr)$$

$$lShrCI = f(lShrp, lGgdp, lInfr, lFop, lExr, lUsdr, lGfc) \dots \text{equ.v}$$

**Table 2:** The a priori table showing the expected relationship of variables

| Parameters  | Capital inflows | Sectoral performance | GDP | Inflation | Exchange rate | Financial openness | United States lending rates | Global Financial cycle |
|-------------|-----------------|----------------------|-----|-----------|---------------|--------------------|-----------------------------|------------------------|
| Expectation | +               | +/-                  | +/- | +/-       | +/-           | +/-                | +/-                         | +/-                    |

*Source:* Author's computation, 2022

### 3.1.3 Apriori Expectation

The apriori expectation suggests sectoral performance has a direct impact on capital inflows, thus an increase in sectors' performance attracts more capital inflows and a decrease in the sectors' performance repels capital inflows. Financial openness can be good as it encourages investors to choose correctly economies that are open for investment and provides investors with data for them to carry out their risk assessment. However, when a country has negative current account balances, the investors get cautioned, and more times than often they retract capital. *GDP* also affects capital inflows directly as a high *GDP* from a particular sector signals investors on the profitability which prompts them to direct flows but low *GDP* discourages capital inflows. Inflation is generally disliked by businesses men but a good or moderate inflation rate attracts capital inflows but a high inflation rate repels capital inflows. The United States lending

rate is seen as a global driver of capital inflows, when the rate is high, capital inflows increases to other countries and reduces once the lending rate is low. The global financial cycle also affects capital inflows. When the *GFC* is high, capital inflows are also high and when the *GFC* is low, capital inflows are low.

### 3.2 Description and Measurement of Data

i. Capital inflows: This is the combination of the FDI, FPI, and OFI into the sectors of the Nigerian economy. It is represented as CI. It is measured as:

$$\sum \begin{pmatrix} FDI \\ FPI \\ OFI \end{pmatrix}$$

ii. Sectoral performance: This refers to the productivity of the sector. It is represented as SP. The

measurement is  $\frac{y_t - y_{t-1}}{y_t} * 100$

iii. Pull factors: This refers to the domestic or home macroeconomic indicators that attract capital inflows. It has its sub-variables; the study uses the gross domestic product, financial openness, and taxation.

The pull factors variables are represented as:

Gross domestic product: *GDP* and is calculated as  $GDP = \text{Consumption} + \text{Investment} + \text{Government Spending} + \text{Net Exports}$

Inflation rate: *Infr* is the overall economic change in prices of good and services.

Financial openness: *FOP* and is calculated as total capital flows as a share of *GDP*.

This measure is the sum of inflows and outflows of direct investment, equity investment, debt

securities, financial derivatives, and other investments.

Exchange rate: Exr is presented with the rate of change between the Dollar and the Naira.

iv. Push factors: This refers to external factors that affect capital inflows. Its variables are the global financial cycle and United States lending rate. The global financial cycle is represented as GFC and it is measured as Volatility Index (VIX). While the United States lending rate is the approved target rate by the Federal Open Market Committee, which bank lend and borrow the excess reserves.

### 3.3 Source of Data

The sources of data used in the analysis are from multiple sources. They are from credible and reliable sources, the Central Bank of Nigeria, Chicago Boards Option Exchange, and World Data AI.

**Table 3:** Potential sources of variables

| <b>Variables</b>         | <b>Data Source</b>             |
|--------------------------|--------------------------------|
| Sectoral capital inflows | CBN statistical bulletin, 2019 |
| Sectoral performance     | CBN statistical bulletin, 2019 |
| Pull factors:            |                                |
| GDP                      | World development index, 2019  |
| Financial openness       | World development index, 2019  |
| Inflation rate           | CBN statistical bulletin, 2019 |
| Exchange rate            | CBN statistical bulletin, 2019 |
| Push factors:            |                                |
| Global financial cycle   | Chicago Board Options Exchange |
| US Lending Rate          | World Data AI                  |

**Source:** *Author's computation, 2022*

### **3.4 Preliminary Analysis**

To show what pattern capital inflows depict across sectors in Nigeria, descriptive analysis such as a measure of central tendency and dispersion which includes the mean, median, and measure the standard deviation and covariance. More so, the use of graphs are utilized to depict the trend in data.

### **3.5 Pre-estimation Tests**

The pre-estimation tests are the unit root test and co-integration. The unit root test is used to check if the variables are stationary: Variable that appear to be non-stationary after the first test is discarded or presumed non effective in the model. The use of the co-integration test is to check if the variables picked to have a long-term relationship.

#### **3.5.1 Unit Root Tests**

Unit root tests is carried out on all the variables to ensure the credibility of data. As variables can be non stationary over period of time. More so, the unit root test is important so as to avoid spurious regression in the estimation.

#### **3.5.2 Co-Integration Tests**

Co-integration tests is carried out on all the variables identified in the literature which ensures that there exists a relationship among variables to be used in the regression analysis. It is important that there is a co-integrating level among the variables to ensure that results depicts economic reality.

### **3.6 Techniques of Estimation**

For the analysis of the study, multiple techniques are employed to achieve the results.

#### **3.6.1 Objective 1**

To achieve the third objective of the research, the likelihood of variables to turn out as  $I(1)$  and  $I(0)$  variables is dependent on their unit root, preferably, the unit-root of variables at levels is most appreciated but in the absence of such, the alternative is used that is, unit root of order one. Thus, in the emergence of the latter, the study proposes the use of the ARDL model. However, this is subject to change if the result shows no  $I(1)$  and  $I(0)$  variables after the pre-estimation tests.

#### **3.6.2 Objective 2**

To achieve the second objective, a simultaneous equation using the three stage least squares method and the two stage least squares method (this is included in the appendix). It is important to do the simultaneous equation as it is shown in empirical results the different variable that affect capital inflows to back the conceptual framework.

### **3.7 Proposed Contributions to Knowledge**

Existing literature on the analysis of capital inflows to the sectors of the economy did not take into their analysis the sector's performance. Investigating how capital inflows to the sectors of the economy while putting in perspective the sectors' performance in the model ultimately explains the pattern of capital inflows. More so, this thesis on the sectoral analysis of capital inflows would help policymakers understand the importance of the sector's performance which in turn aids them in making tentative decisions that improves the performance of sectors most especially when trying to attract a particular type of flow.

## Endnotes

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## **Chapter Four**

### **Results and Discussion of Findings**

#### **4.1 Preliminary Analysis**

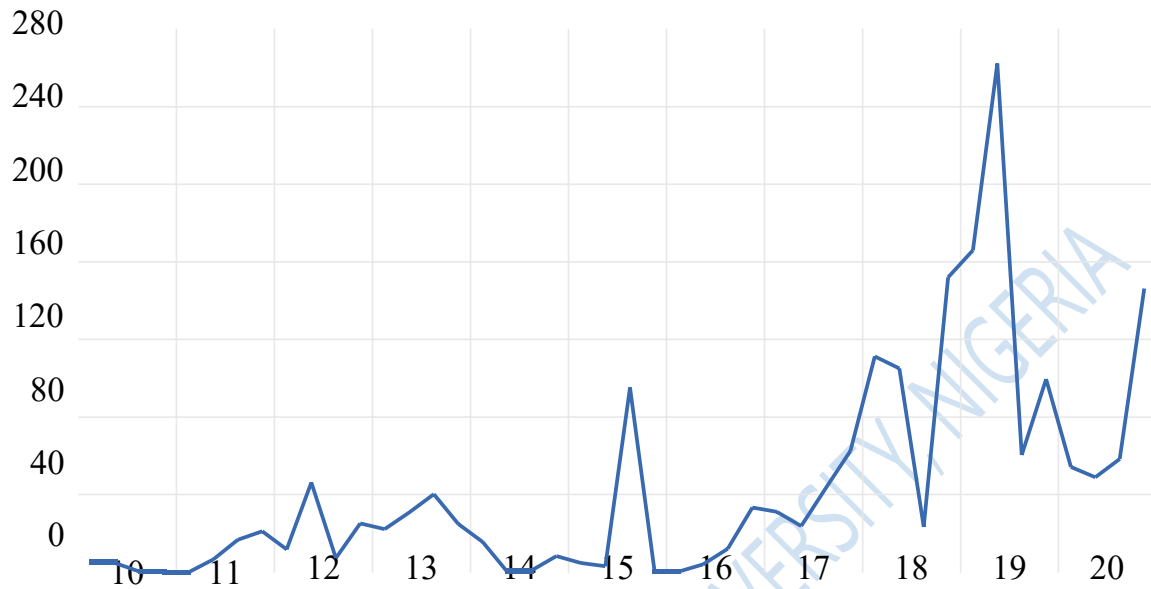
The preliminary analysis is important as it gives a basic overview of all the variables. The graphs of each variable is to show the historical trend and the measure of central tendency, dispersion and distribution gives an overview of the spread, and other relevant data information.

##### **4.1.1 Descriptive Statistics**

###### **Graphs (trend analysis)**

The descriptive analysis of the different variables presents a pictorial view of the individual variable over the course of the decade. Data used in this study are quarterly. The five sectoral capital inflows are shown, the other independent variables identified in existing literature such as GDP, inflation, exchange rate, United States lending rate, and global financial cycle. As well as sectoral performance an introduced variable. The graphical presentation of variable gives readers first hand insight into the characteristics of the variables to be used in analysis.

### AgrCI



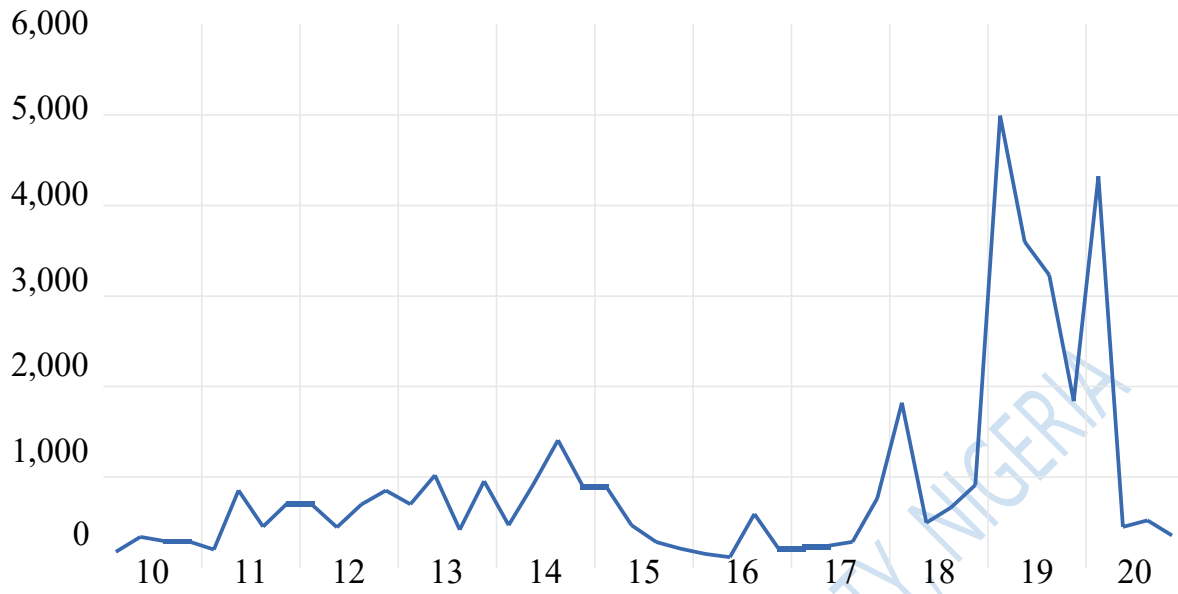
**Fig 1: Agricultural Sectoral Capital Inflows from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

The agricultural sectoral capital inflows showed dramatic improvement from the first quarter in 2010, an improvement was observed in 2011. A sharp improvement in 2013 and 2014, a down trend was experienced in 2015-2016. In the periods of 2017-2019, the capital inflows into the agricultural had surge. Within the quarters of 2020, capital inflows into the sector reduce compared to its previous highs.

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## FinCI



**Fig 2: Financial Sectoral Capital Inflows from 2010-2020 Quarterly data**

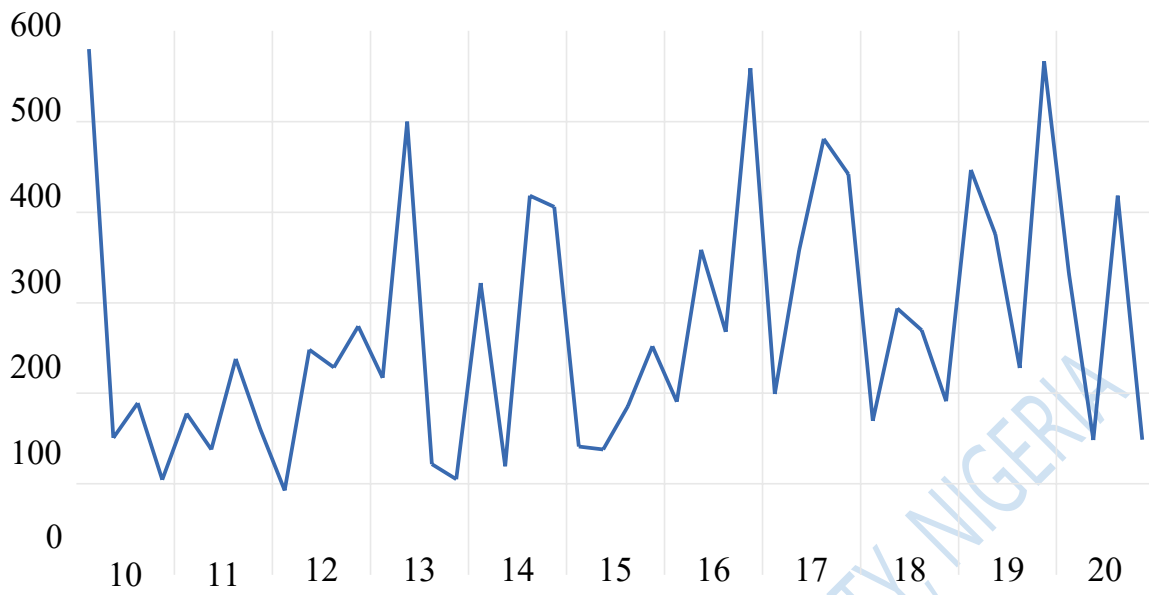
**Source:** *Author's computation, 2022*

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The financial capital inflows showed a steady amount within the quarters of 2010-2014. It reduced within the periods of 2015 to early quarters of 2017. From the mid-quarters of 2017 to 2018, there was a sharp rise, till the late quarters where capital inflows reduced. In 2019 capital inflows rose up to a record high. A reversal of flows was experienced a bit. In 2020, capital inflows surged for almost as high as the last surge but a strong reversal followed immediately.

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### IndCI

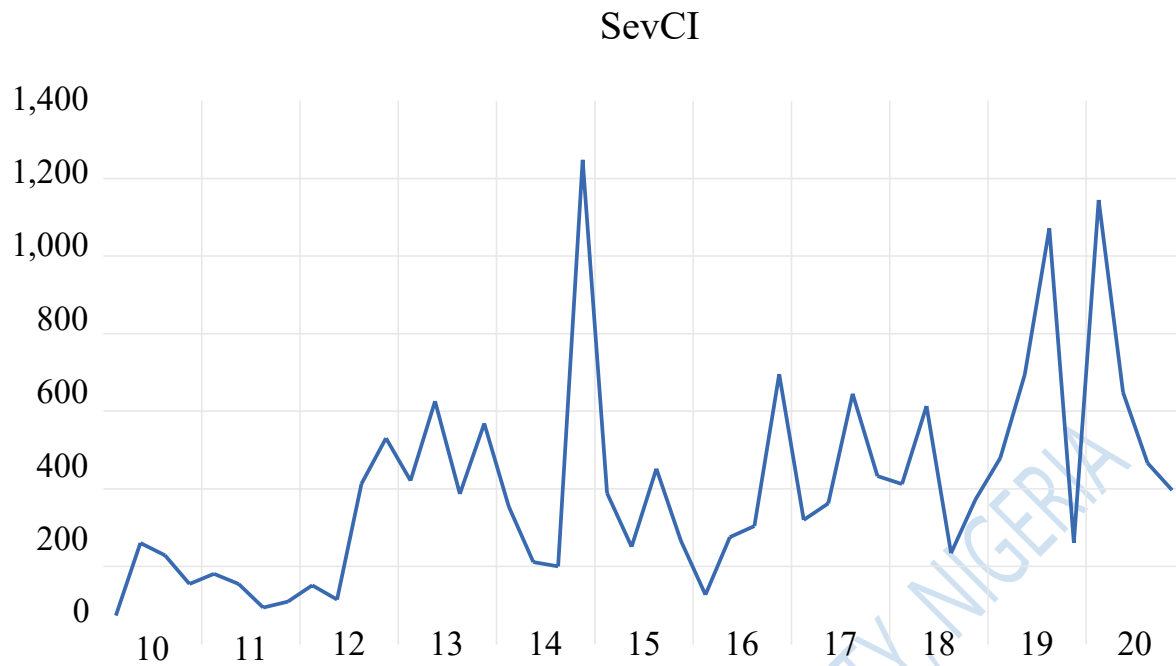


**Fig 3: Industrial Sectoral Capital Inflows from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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Capital inflows into the industrial sector show a varying pattern as a swing was experienced in all quarters for the decade. In 2000, the sector began with large surge in capital inflows but a sharp decline followed. Within the periods of 2011 and 2013, capital inflows were steady but a surge occurred within the last quarters of 2012 and the early quarters of 2013. For the late quarters of 2013, capital inflows into the sector reduced but a surge occurred within the late quarters of 2013 and 2014. From the mid-quarters of 2014 a surge occurred and a reversal followed in 2015. Capital inflows picked up in latter quarters of 2015 and a surge followed in 2016. A sharp decline followed but a surge was recorded in 2017. From the early periods of 2018, a reversal was experience but a surge occurred in 2019. The 2020 showed a similar trend in 2020 as a surge was recorded in the early periods followed by a reversal in the late quarters.



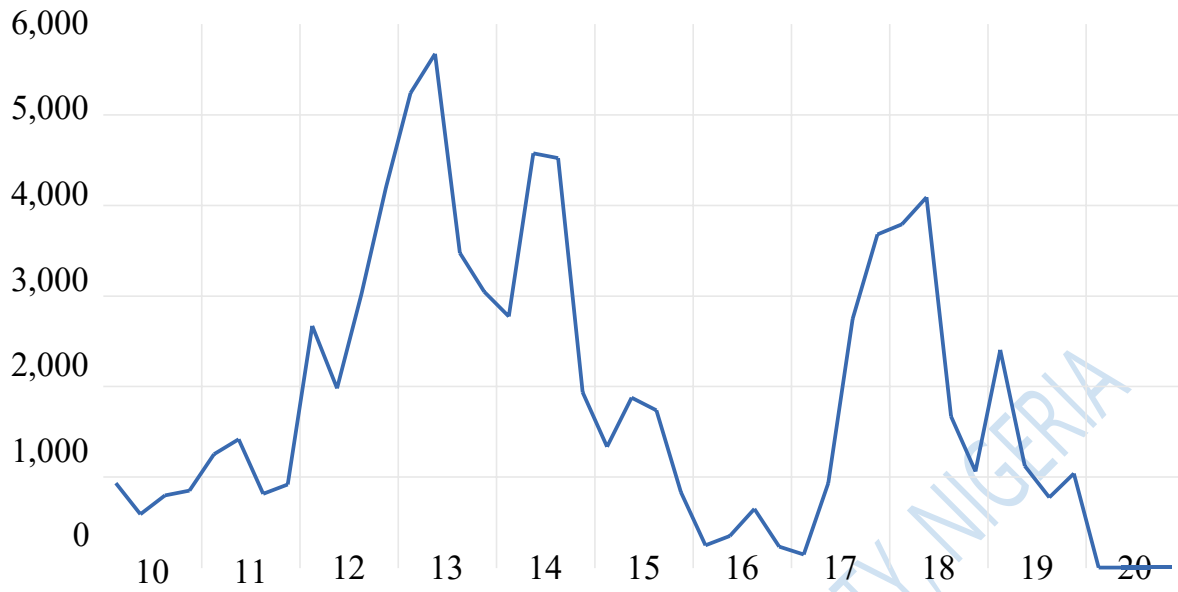
**Fig 4: Services Sectoral Capital Inflows from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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The capital inflows into the services sector shows a period of low and high. From the periods of 2010 to 2012, capital inflows were steady until a surge occurred in the mid quarters of 2012. Capital inflows rose a bit higher in 203, reduce in the late quarters of 2013, surge again experienced in lid quarters of 2013, followed by a strong reversal. In 2014, capital inflows rose to a record high in the mid-quarters but a reversal occurred within the late quarters of 2014 and 2015. Within the quarters of 2015 to 2016, capital inflows were steady and a surge was experienced in the late quarters of 2016 and a reversal followed. By the periods of 2017-2018, capital inflows were swinging, that is high-lows were experienced followed by a surge in the late quarters of 2018 and early 2019 and a strong reversal in 2019. A sharp pick up from the surge in 2020 was recorded.

### ShrCI



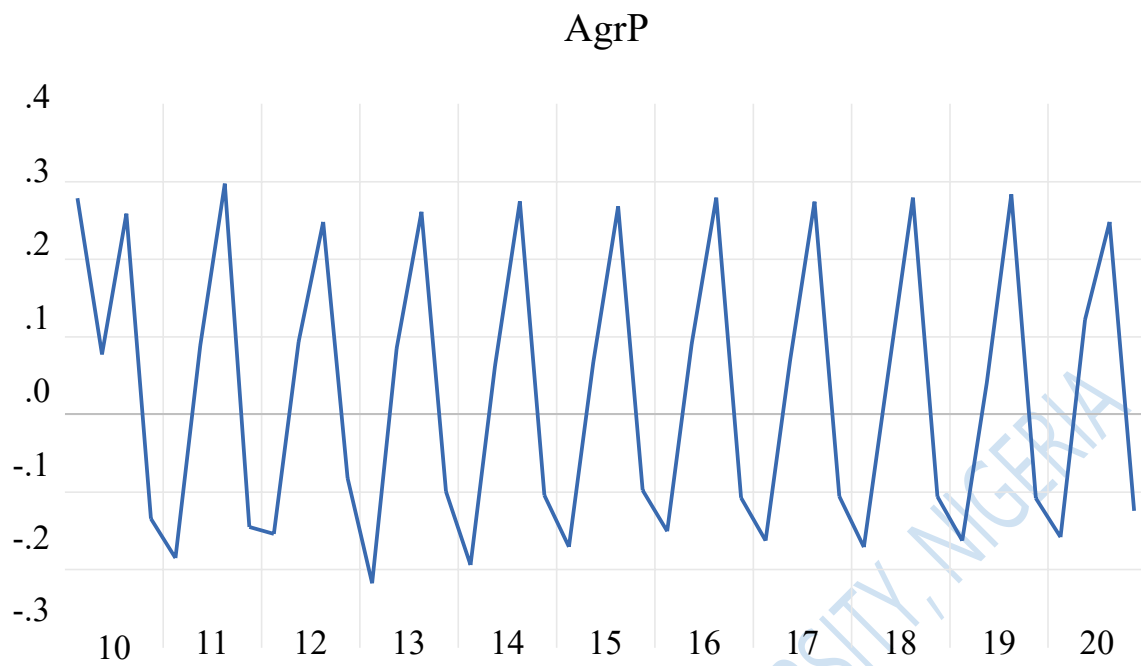
**Fig 5: Shares Sectoral Capital Inflows from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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Capital inflows into the shares sector within the periods of 2010 and 2020 show a period lows and highs. From 2010 to 2011, capital inflows to the sector showed a steady flow until a surge in 2012 and little reversal was experienced but sharp surge with the late periods of 2012 to 2013. A reversal followed and a surge in 2014, then a sharp reversal from 2015 to 2016. By 2017 to 2018, a surge in capital inflows was recorded, a reversal of inflows occurred in the last quarter of 2018. In the first quarter of 2019, capital inflows surge and a decline was experienced in the last quarter of 2019, which followed by a complete reversal in 2020.

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**Fig 6: Agricultural Sectoral Performance from 2010-2020 Quarterly data**

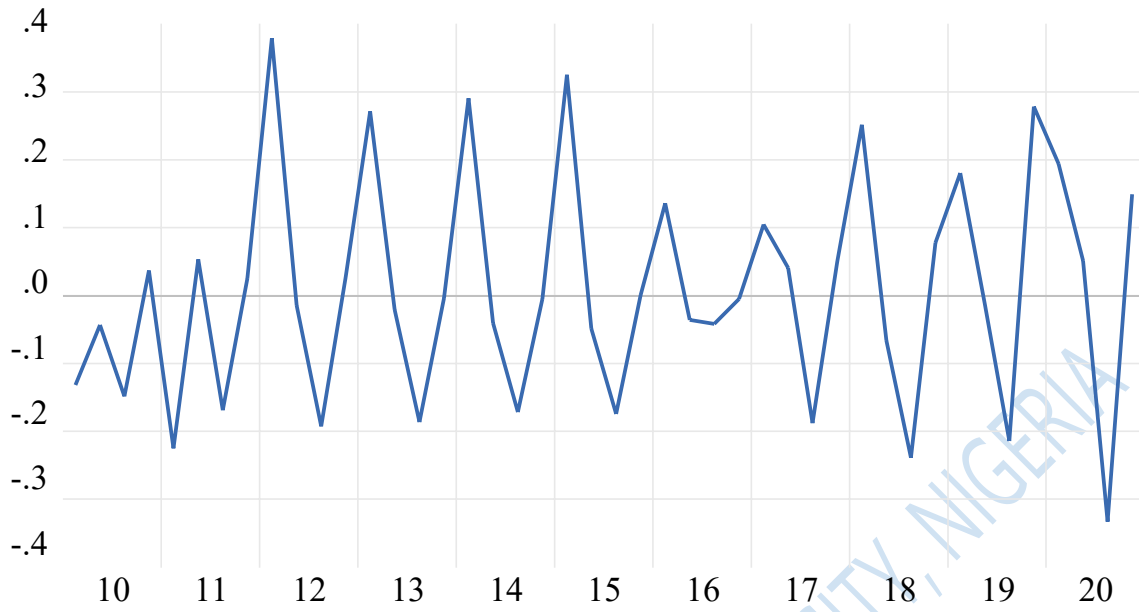
**Source:** *Author's computation, 2022*

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The agricultural sectoral performance shows periods of high and lows. In 2010 a strong surge, a reversal in the mid period, a surge again and a reduction in performance. In 2011, a sharp surge occurred and a deduction followed. For 2012, a similar pattern like that of 2011 occurred, sharp surge occurred and a deduction followed. In 2013 sharp surge occurred and a deduction followed. For all the periods from 2011 to 2020, a similar pattern was recorded as sharp surge occurred and a reduction followed.

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### FinP



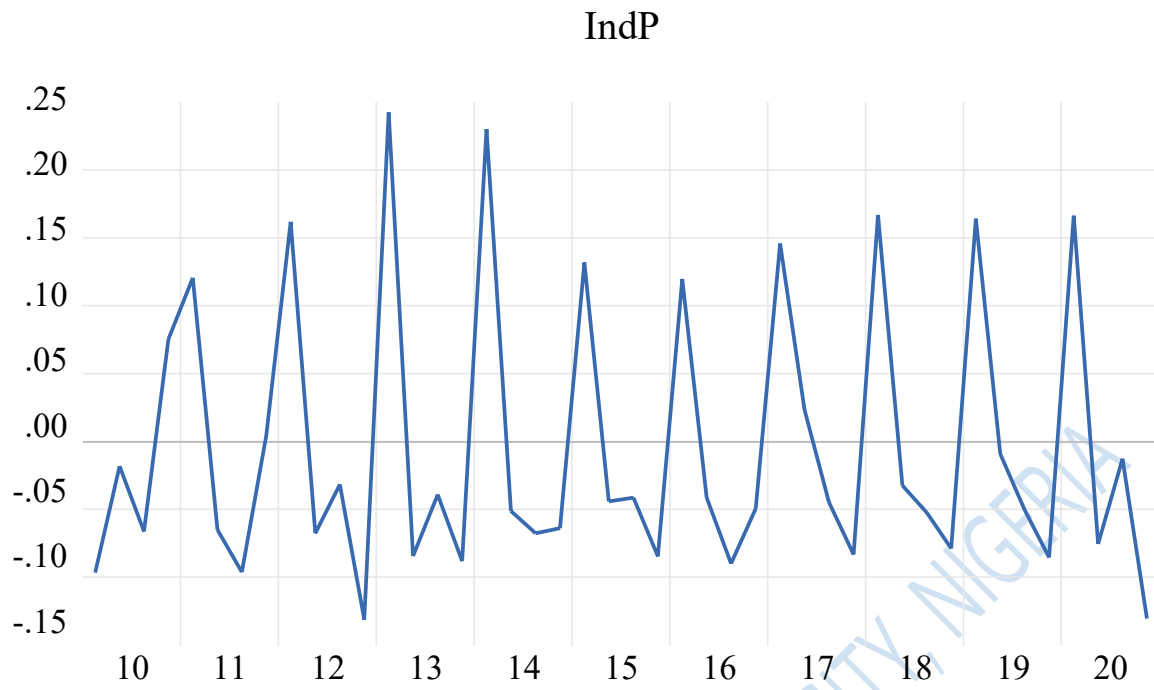
**Fig 7: Financial Sectoral Performance from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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The financial sectoral performance experienced strong highs and low and this evolved around positive and negative economic indicators. In 2010 and 2011, the sector underperformed, within the period of 2012, the sector performed well, then returned to a negative value. A similar trend is observed from 2013-2020 as the performance of the sector increases and reduced within each year.

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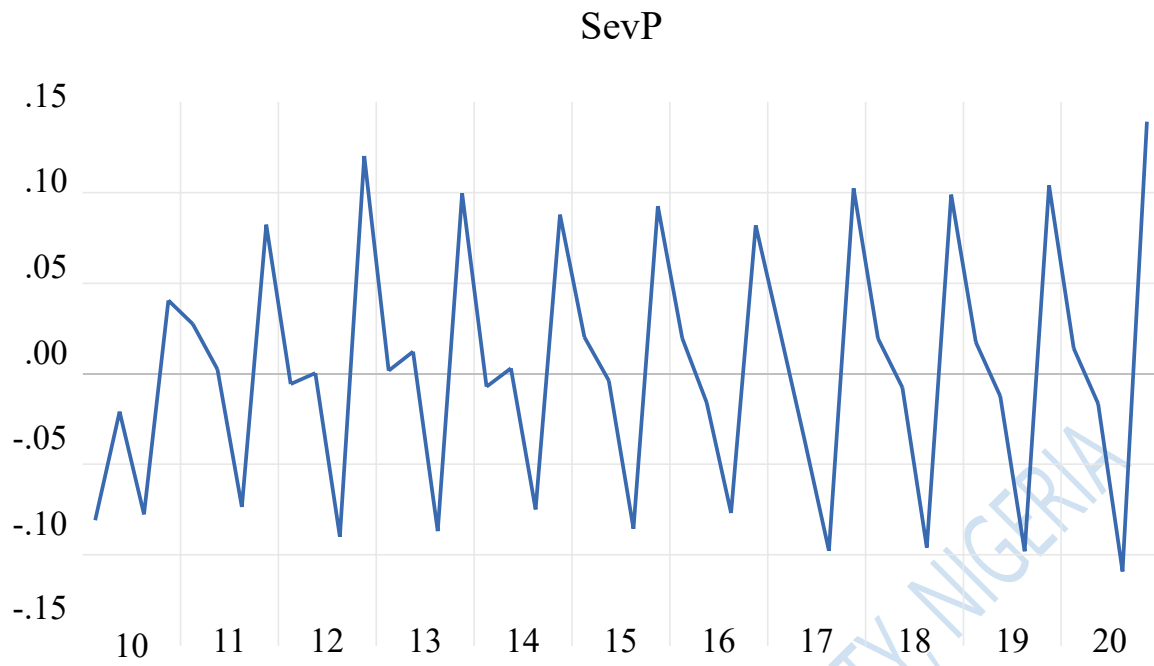
**Fig 8: Industrial Sectoral Performance from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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The performance of the industrial sector from the period of 2010 to 2020 shows a improvement and nonperformance year after year. In the graphical presentation, the increase in performance usually occurs in the beginning of mid of each year while nonperformance usually occurs toward the ending of each year. However, a strong negative nonperformance occurred at the end period of 2020.

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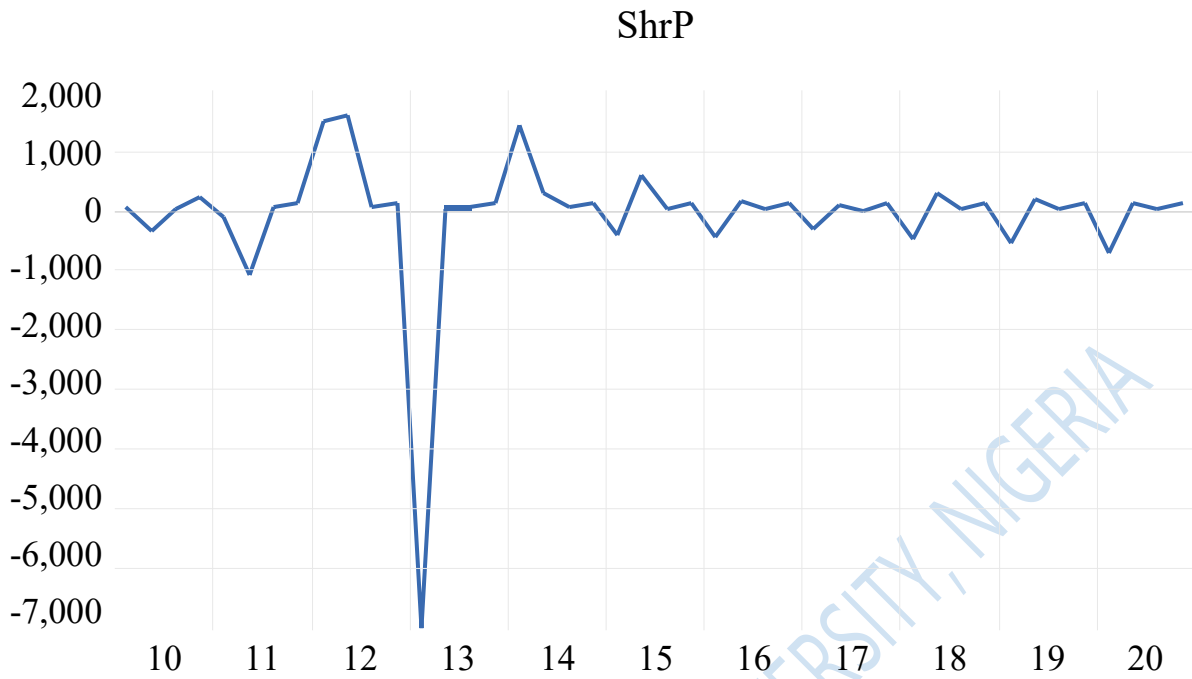
**Fig 9: Service Sectoral Performance from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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The service sector from the periods of 200-2020 experienced positive and negative growth. The positive impact was usually at the beginning of the period. And the negative performance was usually after the third quarter towards the end of the year and a repeat occurs. The positive performance of the sector was in the last quarter of 2012 and the mid third quarter of 2020. The lowest negative performance was in 200, while the highest negative performance was in 2020.

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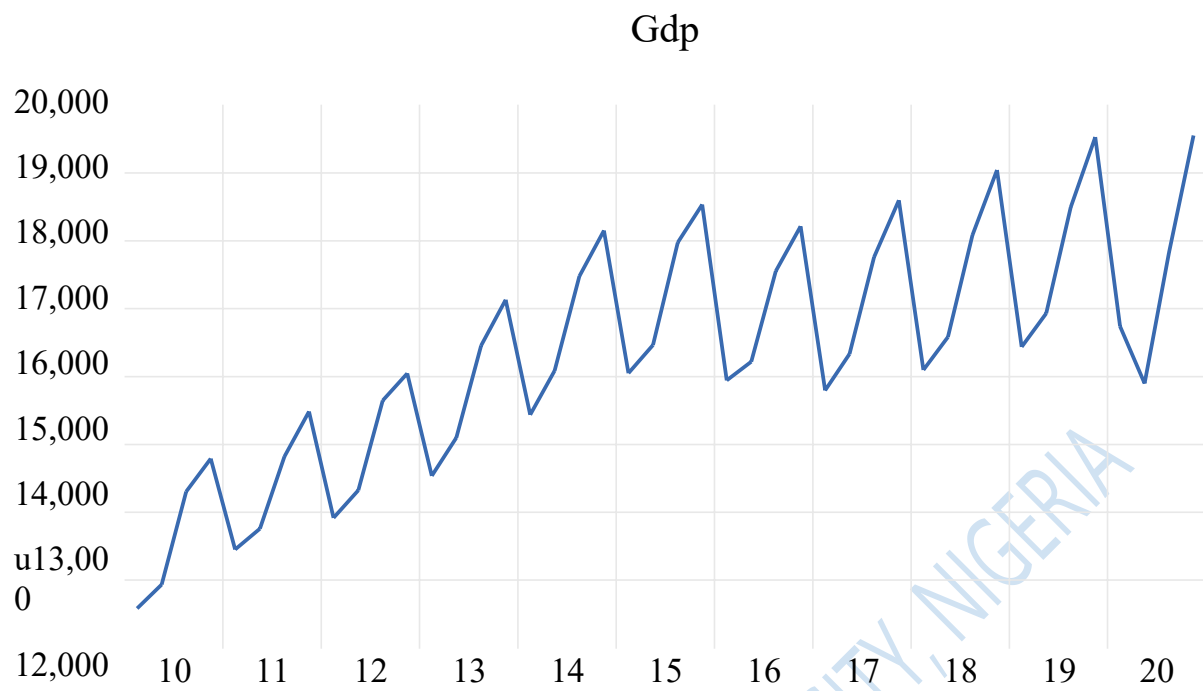
**Fig 10: Shares Sectoral Performance from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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The shares performance shows a low-high and a high-low. The shares performance from 2010 was negative in the first two quarters but later positive in the last quarter. In 2011, the performance dropped and became positive in its last quarter. In 2012, the performance was at its highest. But the first and second quarter of 2013 shows drastic under performance of the sector but it picked up in the last quarter of 2013. From 2014-2017, a steady improvement in the sector is observed and little nonperformance is shown. However, the beginning of 2018 started with a nonperformance in the sector and a similar trend is observed in 2019 as well. The year 2020 ended with positive performance.

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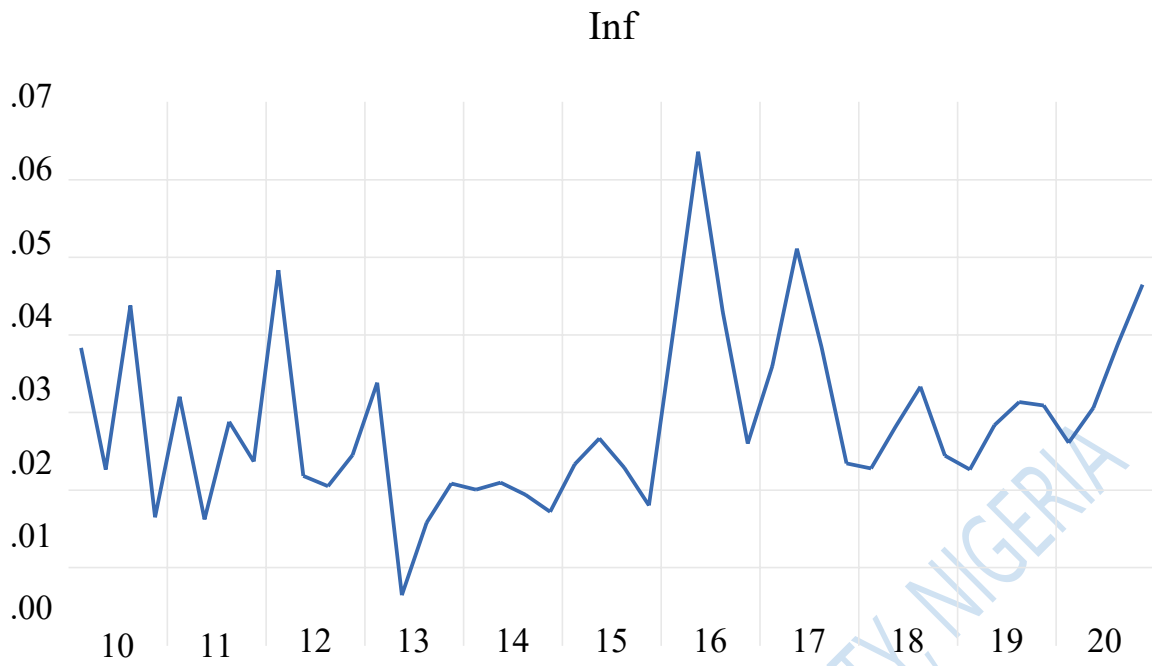
**Fig 11: Gross Domestic Product from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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The GDP from the periods of 2010 and 2020 showed increase in the past decade. From 2010 to 2020, the GDP increased and improved at the same intervals as well as fell, especially at the third quarter and picked up from its previous low to be better in the next year. The Nigerian government GDP has thus been improving. Only within 2016 and 2017 that the GDP was almost similar, nevertheless, in 2019 and 2020 it improved significantly.

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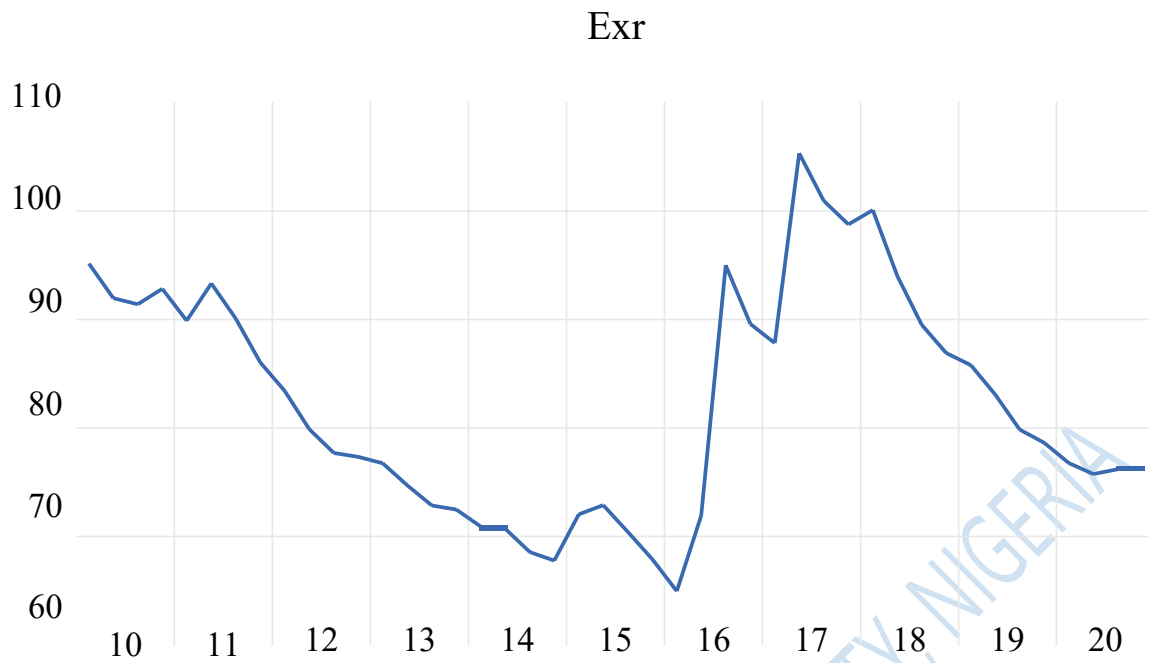
**Fig 12: Inflation Rate from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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The inflation rate from the periods of 2010 to 2020 was in a trend like manner. In 2010 the inflation rate grew at two quarters, the first and third. While in 2011, the inflation rate was lower compared to the previous year but still observed an increase. In 2012, inflation increased to the third record high in this period followed by a decline in the latter quarters. Inflation rose in the first quarter of 2013 but dropped to a low in the second quarter. In all the quarters of 2014 inflation rate was within the same range. Inflation rose in 2015 and the following year 2016, inflation reached its highest within the ten year period. By the late quarter of 2016, inflation reduced but picked up in 2017, as its second highest point. From 2018 to 2019, inflation was within the same bracket but jumped in 2020.

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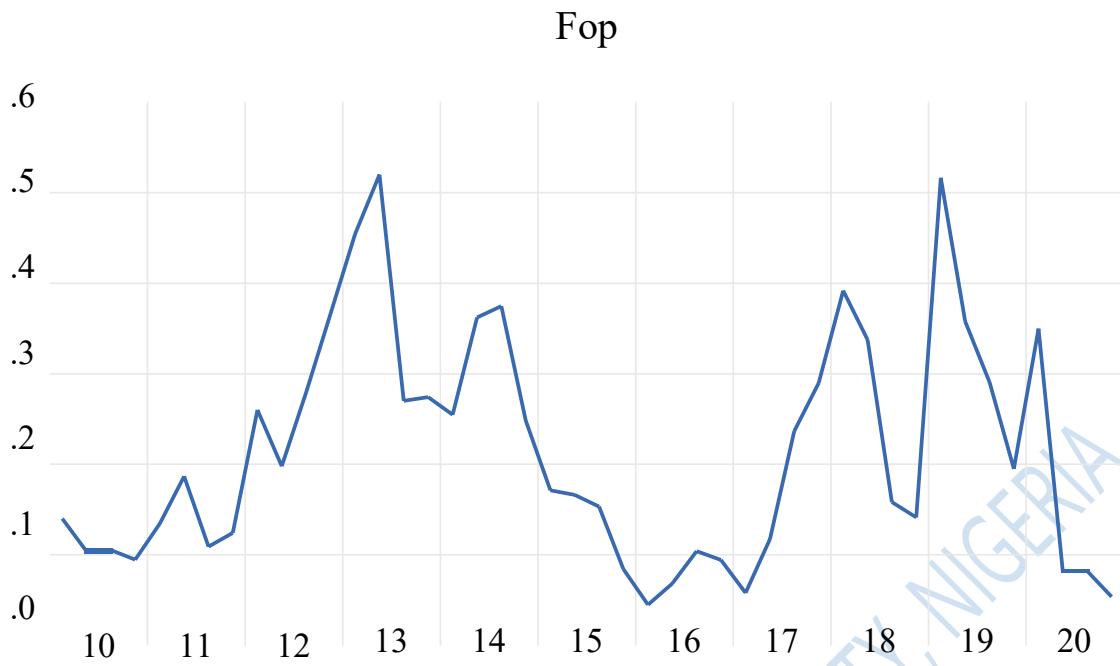


**Fig 13: Exchange Rate from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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The exchange rate is the measurement of the Naira against the Dollar from 2010-2020 using quarterly data. The exchange rate is usually higher, that is Naira's value improves in ratio to Dollar when the economy records more export as it translates to more foreign earnings and lower when the economy records more importation. In the chart, where the point is highest, means the Naira is weaker in ratio to the dollar, and better when it's at the lowest point in the chart. In the early quarters of 2010 and 2011, the exchange rate was unfavourable, that is to get more dollars, one needed more naira. From the first quarter of 2012 to the last quarter of 2014, the exchange rate was favourable as less naira was needed to get dollar, but in 2015 an increase occurred within the second and third quarter, and in the latter part of 2015, the exchange rate was most favourable. However, in 2016, the exchange rate began to rise to the same peak as that of 2011, nevertheless, it retrogressed a bit and jumped to its highest in 2017. In 2018, it was still relatively high. The year 2019 and 2020 saw drastic reduction in the exchange rate.



**Fig 14: Financial Openness from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

The chart above shows the financial openness level in Nigeria. From 2010, it was at its second lowest point. It however improved in 2011, 2012 and a turning point was from the last quarter of 2012 to the first quarter of 2013. It reduced again in 2014 first quarter but rose back in the second and third quarters of 2014. From the last quarter of 2014 to the 2015, financial openness was low and it reached its lowest point in the early quarters of 2016 but grew a bit within the third and fourth quarters. Financial openness improved from 2017 to 2018, however, in the last quarter of 2018, it was low but picked up to a new high from the late quarter of 2018 to the first two quarters of 2019. The third quarter of 2019 showed low level of financial openness but improved in 2020, however, the last quarter of 2020 recorded a similar low point in financial openness.

### GFC



**Fig 15: Global Financial Cycle from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

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The global financial cycle shows high volatility every year. In 2010 the financial cycle was at its highest point, reduced in the first quarter of 2011 and grew a bit within the last and first quarters of 2012. It further went lower to its third lowest point in the third quarter of 2012 and following year 2013 recorded the lowest point of the global financial cycle. It grew steadily in 2014 and 2015 but reduced in third quarter of 2015. The year 2016 recorded growth in the global financial cycle. Through the periods of 2017, the global financial cycle was within the same range. The year 2018 recorded growth in the global financial cycle and a leap was recorded from the latter period of 2018 to 2019. The third quarter led to a reduction in the financial cycle as the last quarter improved a bit. The year 2020 saw an improvement in the global financial cycle within the second and third quarters and a decline in the last quarter.



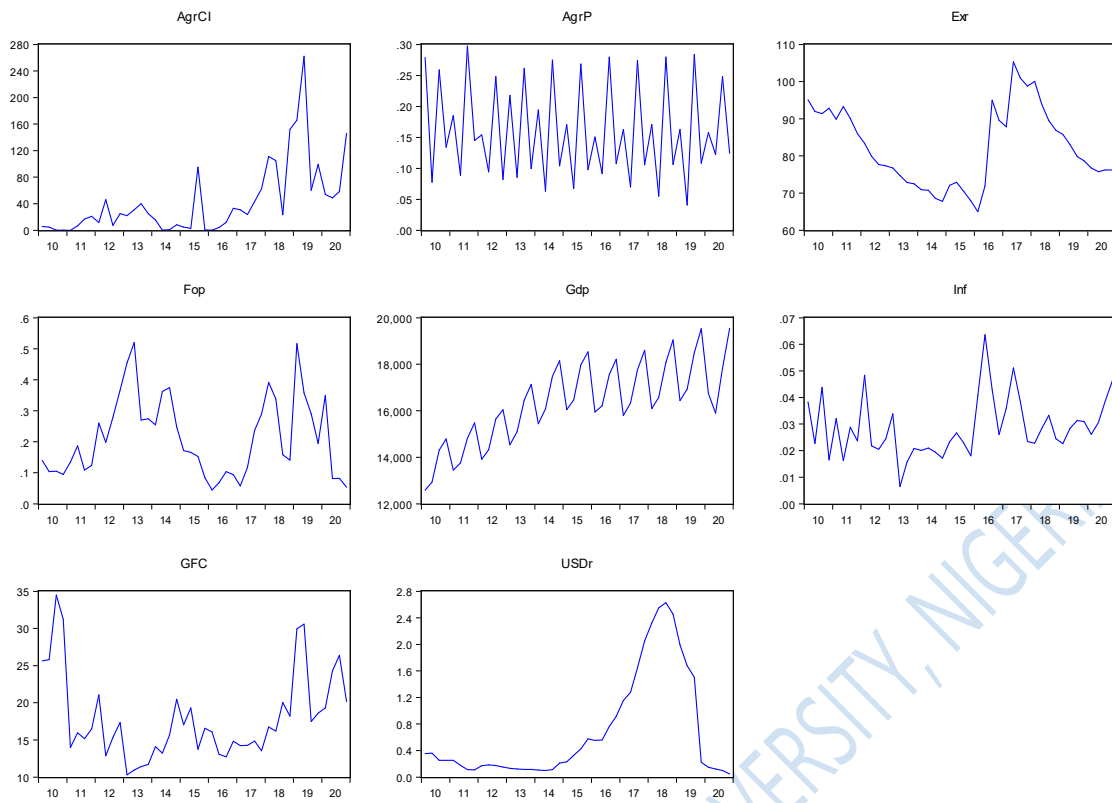
**Fig 16: United States Lending Rate from 2010-2020 Quarterly data**

**Source:** *Author's computation, 2022*

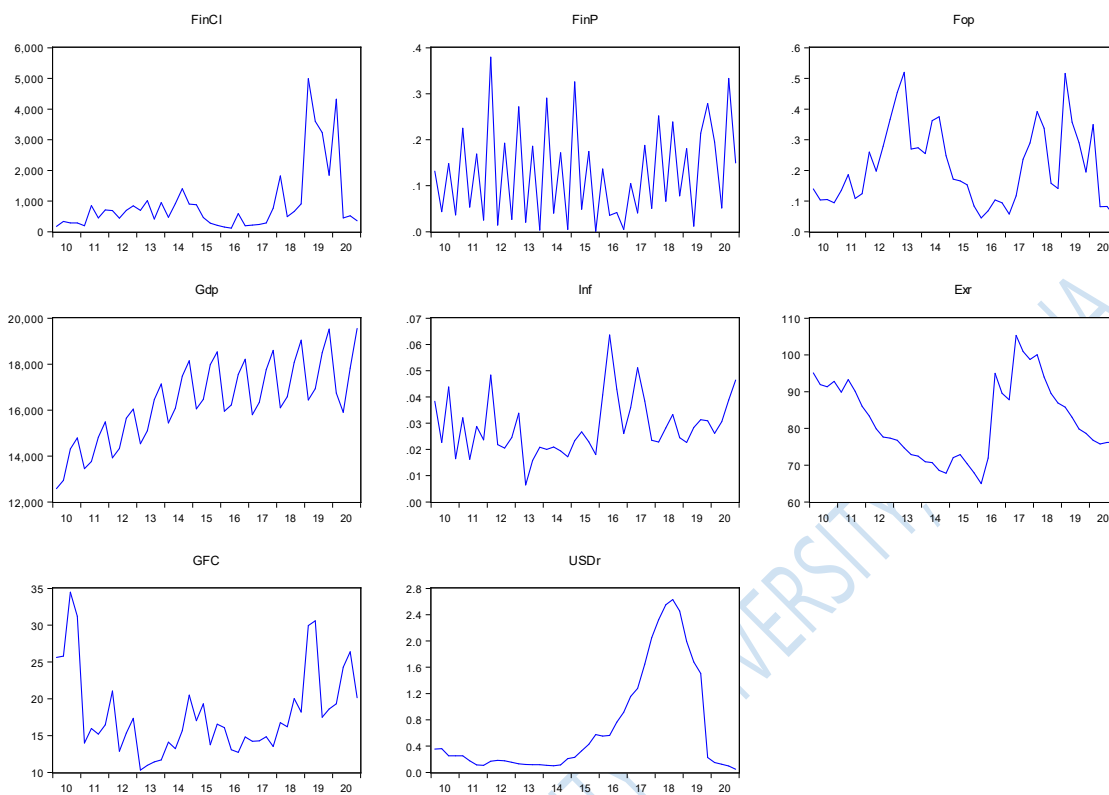
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The United States lending rate shows a steady flow from the year 2010 to 2014. The last quarter of 2014 show growth in the lending rate as it continued in 2015. The year 2016 saw a slight reduction in capital inflows but rose continuously from the third quarter of 2016 to its record highest in 2018. A decline in the lending rate followed from the last quarter of 2018 to 2020.

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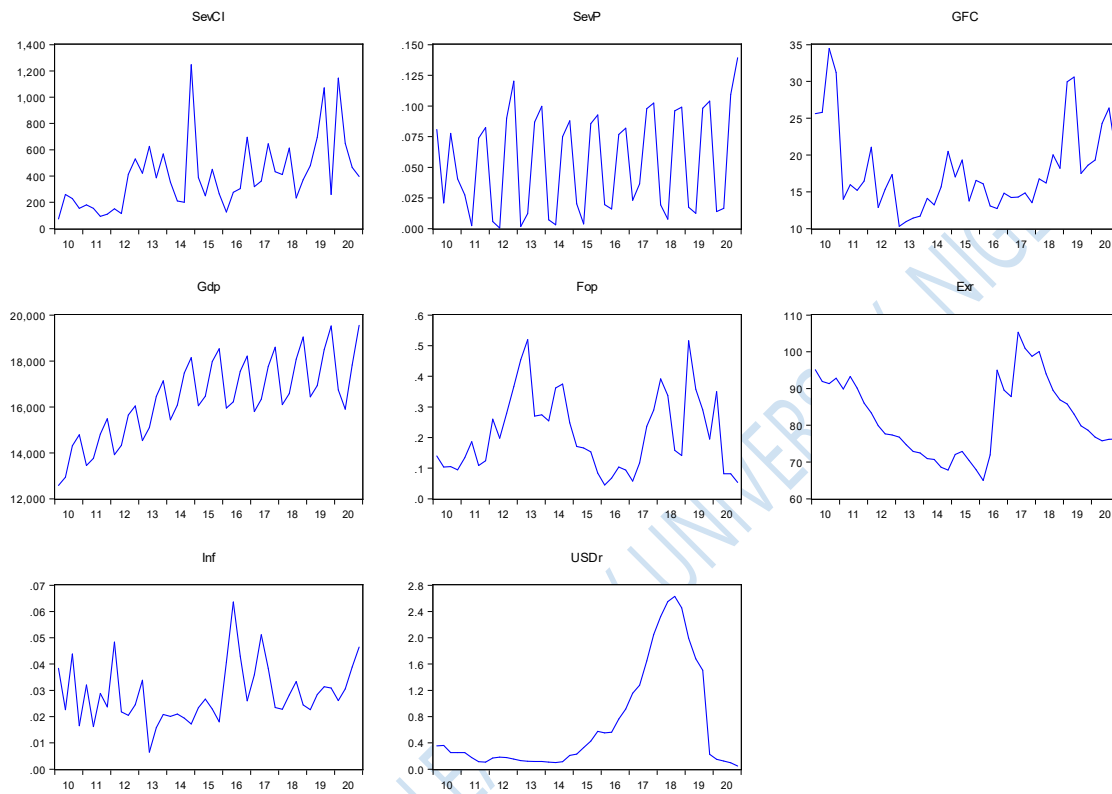
**Fig 17: Relationship of the Agricultural Sectoral Capital Inflows and the Selected Pull and Push Factors from 2010-2020 Quarterly data**



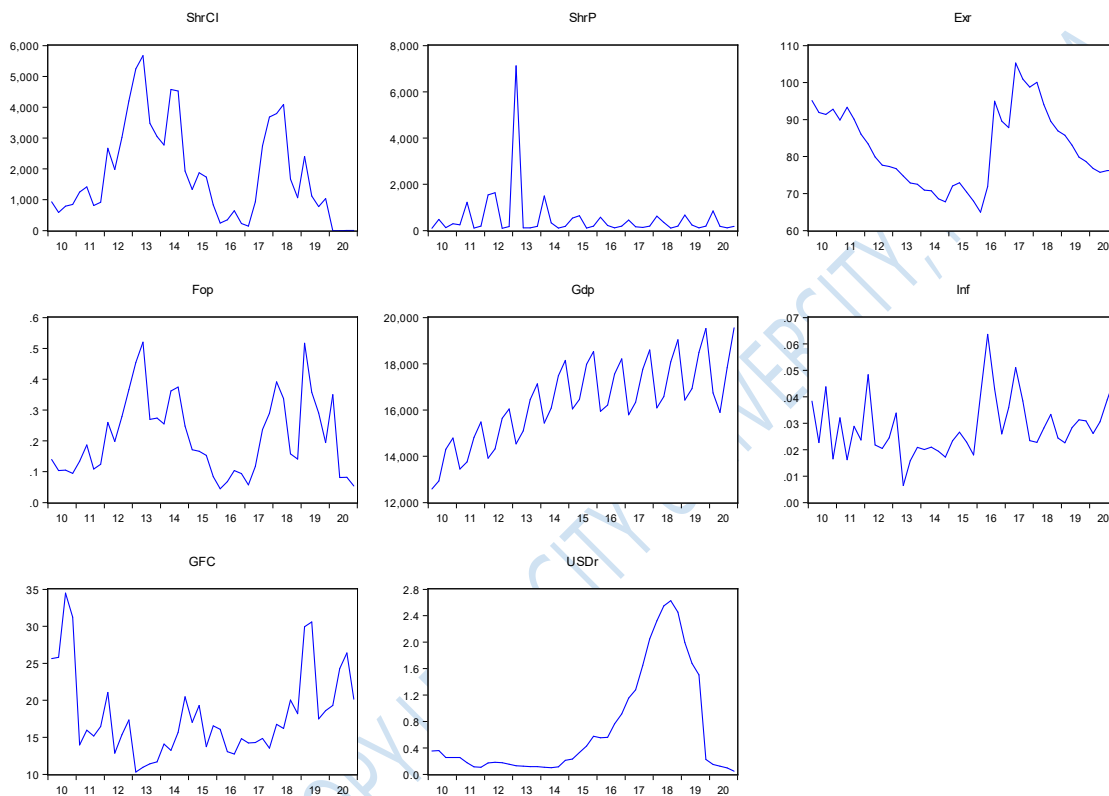
**Fig 18: Relationship of the Financial Sectoral Capital Inflows and the Selected Pull and Push Factors from 2010-2020 Quarterly data**



**Fig 19: Relationship of the Industrial Sectoral Capital Inflows and the Selected Pull and Push Factors from 2010-2020 Quarterly data**



**Fig 20: Relationship of the Services Sectoral Capital Inflows and the Selected Pull and Push Factors from 2010-2020 Quarterly data**



**Fig 21: Relationship of the Shares Sectoral Capital Inflows and the Selected Pull and Push Factors from 2010-2020 Quarterly data**

**Table 4: Measure of Central Tendency, Dispersion and Distribution**

|                     | AGRCI    | AGRP     | EXR    | FINCI    | FINP     | FOP  | GDP      | GFC     | INDCI    | INDP     | INFR | SEVCI    | SEVP     | SHRCI    | SHRP     | USDR  |
|---------------------|----------|----------|--------|----------|----------|------|----------|---------|----------|----------|------|----------|----------|----------|----------|-------|
| <b>Mean</b>         | 42.9     | 0.032    | 82.4   | 916.3    | 0.03     | 0.21 | 16342.57 | 17.99   | 271.6    | 0.01     | 0.03 | 404.29   | 0.01     | 1849.56  | -13.84   | 0.68  |
| <b>Median</b>       | 23.5     | 0.022    | 79.9   | 555.4    | 0.01     | 0.18 | 16276.63 | 16.33   | 233.2    | 0.01     | 0.03 | 367.24   | 0        | 1292.63  | 109.07   | 0.25  |
| <b>Maximum</b>      | 262.2    | 0.088528 | 105.3  | 4990.2   | 0.14     | 0.52 | 19550.15 | 34.49   | 580.23   | 0.06     | 0.06 | 1248.03  | 0.02     | 5675.81  | 1639.37  | 2.63  |
| <b>Minimum</b>      | 0        | 0.00166  | 64.9   | 114.9    | 6.79E-07 | 0.05 | 12583.48 | 10.31   | 92.47    | 1.89E-05 | 0.01 | 72.72    | 1.37E-07 | 0        | -6923.98 | 0.05  |
| <b>Std. Dev.</b>    | 55.3     | 0.028021 | 10.5   | 1091.8   | 0.04     | 0.13 | 1741.15  | 5.82    | 138      | 0.01     | 0.01 | 268.39   | 0.01     | 1557.05  | 1170.27  | 0.79  |
| <b>Skewness</b>     | 2        | 0.7546   | 0.29   | 2.4      | 1.53     | 0.69 | -0.15    | 1.19    | 0.73     | 2.22     | 0.89 | 1.42     | 0.78     | 0.79     | -4.69    | 1.32  |
| <b>Kurtosis</b>     | 7.4      | 1.991614 | 2      | 8.3      | 4.86     | 2.59 | 2.4      | 3.71    | 2.44     | 8.03     | 3.89 | 5.03     | 2.96     | 2.57     | 29.18    | 3.29  |
| <b>Jarque-Bera</b>  | 65.7     | 6.039969 | 2.5    | 95.4     | 23.58    | 3.86 | 0.81     | 11.36   | 4.43     | 82.49    | 7.31 | 22.37    | 4.42     | 4.89     | 1417.9   | 12.87 |
| <b>Probability</b>  | 0        | 0.048802 | 0.3    | 0        | 0        | 0.15 | 0.67     | 0       | 0.11     | 0        | 0.03 | 0        | 0.11     | 0.09     | 0        | 0     |
| <b>Sum</b>          | 1887.8   | 1.394657 | 3624.1 | 40315    | 1.2      | 9.39 | 719073   | 791.39  | 11950.48 | 0.45     | 1.27 | 17788.88 | 0.21     | 81380.61 | -608.96  | 29.82 |
| <b>Sum Sq. Dev.</b> | 131340.9 | 0.033763 | 4736.6 | 51257537 | 0.05     | 0.7  | 1.30E+08 | 1454.74 | 818922.2 | 0.01     | 0.01 | 3097600  | 0        | 1.04E+08 | 58890068 | 27.14 |
| <b>Observations</b> | 44       | 44       | 44     | 44       | 44       | 44   | 44       | 44      | 44       | 44       | 44   | 44       | 44       | 44       | 44       | 44    |

Source: Author's computation Eviews Output, 2021

#### 4.1.2 Measure of Central Tendency, Dispersion and Distribution

In the table, all the variables have 44 observations. AGRCI has an average value of 23.5 between the periods of 2010 to 2020 with the minimum value of 0 out of a maximum value of 262.2. It also has a spread value of 55.3: This implies that the values of AGRCI are widely spread. AGRP has an average value of 0.02 between the periods of 2010 to 2020 with the minimum value of 0.0016 out of a maximum value of 0.088. It also has a spread value of 0.028: This implies that the values of AGRP are widely spread. EXR has an average value of 79.9 between the periods of 2010 to 2020 with the minimum value of 64.9 out of a maximum value of 105.3. It also has a spread value of 10.5: This implies that the values of EXR are not so widely spread. FINCI has an average value of 555.4 between the periods of 2010 to 2020 with the minimum value of 114.9 out of a maximum value of 4990.2. It also has a spread value of 1091.8: This implies that the values of FINCI are widely spread. FINP has an average value of 0.01 between the periods of 2010 to 2020 with the minimum value of -6.7 out of a maximum value of 0.14. It also has a spread value of 0.04: This implies that the values of FINP are not widely spread. FOP has an average value of 0.18 between the periods of 2010 to 2020 with the minimum value of 0.05 out of a maximum value of 0.52. It also has a spread value of 0.13: This implies that the values of FOP are widely spread. GDP has an average value of 16276.63 between the periods of 2010 to 2020 with the minimum value of 12583.43 out of a maximum value of 19550.15. It also has a spread value of 1741.15: This implies that the values of GDP are not so widely spread. GFC has an average value of 16.33 between the periods of 2010 to 2020 with the minimum value of 10.31 out of a maximum value of 34.4. It also has a spread value of 5.82: This implies that the values of GFC are not so widely spread. INDCI has an average value of 233.20 between the periods of 2010 to 2020 with the minimum value of 92.47 out of a maximum value of 580.23. It also has a spread value of 138: This implies that the values of INDCI are widely spread. INDP has an average value of 0.01 between the periods of 2010 to 2020 with the minimum value of 0.01 out of a

maximum value of 0.06. It also has a spread value of 0.01: This implies that the values of INDP are widely spread. INFR has an average value of 0.03 between the periods of 2010 to 2020 with the minimum value of 0.01 out of a maximum value of 0.06. It also has a spread value of 0.01: This implies that the values of INFR are widely spread. SEVCI has an average value of 367.24 between the periods of 2010 to 2020 with the minimum value of 72.72 out of a maximum value of 1248.03. It also has a spread value of 268.39: This implies that the values of SEVCI are widely spread. SEVP has an average value of 0 between the periods of 2010 to 2020 with the minimum value of 0.02 out of a maximum value of 0.02. It also has a spread value of 0.01: This implies that the values of SEVP are widely spread. SHRCI has an average value of 1292.63 between the periods of 2010 to 2020 with the minimum value of 0 out of a maximum value of 5675.71. It also has a spread value of 1557.06: This implies that the values of SHRCI are widely spread. SHRP has an average value of 109.07 between the periods of 2010 to 2020 with the minimum value of -6923.98 out of a maximum value of 1639.37. It also has a spread value of 1170.27: This implies that the values of SHRP are widely spread. USDR has an average value of 0.25 between the periods of 2010 to 2020 with the minimum value of 0.05 out of a maximum value of 2.63. It also has a spread value of 0.79: This implies that the values of USDR are widely spread.

### 4.1.3 Correlation Coefficient

The correlation coefficient is prepared for each sector. This is done to prevent future interference of the variables against one another. Owing to the nature of the thesis being on sectoral analysis, it is appropriate that each sector has its own analysis.

|       | AGRCI   | AGRP    | GDP     | INF     | FOP     | EXR    | USDR   | GFC |
|-------|---------|---------|---------|---------|---------|--------|--------|-----|
| AGRCI | 1       |         |         |         |         |        |        |     |
| AGRP  | -0.126  | 1       |         |         |         |        |        |     |
| GDP   | 0.4233  | -0.0006 | 1       |         |         |        |        |     |
| INF   | -0.0201 | 0.1198  | 0.0132  | 1       |         |        |        |     |
| FOP   | 0.2853  | -0.1198 | -0.0222 | -0.4488 | 1       |        |        |     |
| EXR   | 0.1161  | 0.1134  | -0.209  | 0.2194  | -0.1022 | 1      |        |     |
| USDR  | 0.5213  | 0.0009  | 0.3613  | 0.087   | 0.1693  | 0.5257 | 1      |     |
| GFC   | 0.2862  | 0.0555  | -0.1401 | 0.1094  | -0.1344 | 0.1762 | 0.0728 | 1   |

**Source:** Author's computation Eviews Output, 2022

|       | FINCI   | FINP    | GDP     | INF     | FOP     | EXR    | USDR   | GFC |
|-------|---------|---------|---------|---------|---------|--------|--------|-----|
| FINCI | 1       |         |         |         |         |        |        |     |
| FINP  | 0.2219  | 1       |         |         |         |        |        |     |
| GDP   | 0.2016  | -0.0464 | 1       |         |         |        |        |     |
| INF   | -0.1984 | 0.0145  | 0.0132  | 1       |         |        |        |     |
| FOP   | 0.6019  | 0.1898  | -0.0222 | -0.4488 | 1       |        |        |     |
| EXR   | -0.0507 | -0.0862 | -0.209  | 0.2195  | -0.1022 | 1      |        |     |
| USDR  | 0.2706  | -0.0368 | 0.3613  | 0.087   | 0.1693  | 0.5257 | 1      |     |
| GFC   | 0.2969  | -0.0366 | -0.1401 | 0.1095  | -0.1344 | 0.1762 | 0.0728 | 1   |

**Source:** Author's computation Eviews Output, 2022

|       | INDCI   | INDP    | GDP     | INF     | FOP     | EXR    | USDR   | GFC |
|-------|---------|---------|---------|---------|---------|--------|--------|-----|
| INDCI | 1       |         |         |         |         |        |        |     |
| INDP  | -0.1825 | 1       |         |         |         |        |        |     |
| GDP   | 0.2685  | -0.3299 | 1       |         |         |        |        |     |
| INF   | 0.0584  | 0.0567  | 0.0132  | 1       |         |        |        |     |
| FOP   | 0.2129  | 0.222   | -0.0222 | -0.4488 | 1       |        |        |     |
| EXR   | 0.1473  | -0.0042 | -0.209  | 0.2195  | -0.1022 | 1      |        |     |
| USDR  | 0.1955  | 0.0419  | 0.3613  | 0.087   | 0.1693  | 0.5257 | 1      |     |
| GFC   | 0.0423  | 0.0129  | -0.1401 | 0.1095  | -0.1344 | 0.1762 | 0.0728 | 1   |

**Source:** Author's computation Eviews Output, 2022

|       | SEVCI    | SEVP      | GDP     | INF     | FOP     | EXR    | USDR   | GFC |
|-------|----------|-----------|---------|---------|---------|--------|--------|-----|
| SEVCI | 1        |           |         |         |         |        |        |     |
| SEVP  | 0.086247 | 1         |         |         |         |        |        |     |
| GDP   | 0.433288 | 0.2502512 | 1       |         |         |        |        |     |
| INF   | -0.1727  | -0.210601 | 0.0132  | 1       |         |        |        |     |
| FOP   | 0.366474 | 0.0132712 | -0.0222 | -0.4488 | 1       |        |        |     |
| EXR   | -0.16325 | -0.138028 | -0.209  | 0.2195  | -0.1022 | 1      |        |     |
| USDR  | 0.173517 | -0.033552 | 0.3613  | 0.087   | 0.1693  | 0.5257 | 1      |     |
| GFC   | 0.016832 | -0.092455 | -0.1401 | 0.1095  | -0.1344 | 0.1762 | 0.0728 | 1   |

**Source:** *Author's computation Eviews Output, 2022*

|       | SHRCI    | SHRP      | GDP     | INF     | FOP     | EXR    | USDR   | GFC |
|-------|----------|-----------|---------|---------|---------|--------|--------|-----|
| SHRCI | 1        |           |         |         |         |        |        |     |
| SHRP  | -0.23049 | 1         |         |         |         |        |        |     |
| GDP   | -0.09477 | 0.1256802 | 1       |         |         |        |        |     |
| INF   | -0.43919 | -0.026742 | 0.0132  | 1       |         |        |        |     |
| FOP   | 0.806367 | -0.270297 | -0.0222 | -0.4488 | 1       |        |        |     |
| EXR   | -0.1068  | 0.0031816 | -0.209  | 0.2195  | -0.1022 | 1      |        |     |
| USDR  | 0.061026 | 0.0335921 | 0.3613  | 0.087   | 0.1693  | 0.5257 | 1      |     |
| GFC   | -0.40166 | 0.1436973 | -0.1401 | 0.1095  | -0.1344 | 0.1762 | 0.0728 | 1   |

**Source:** *Author's computation Eviews Output, 2022*

## 4.2 Pre-Estimation Tests

### 4.2.1 Summary of Unit Root Test

| Variables | At Levels           |                      | At First Difference |                      | Order of Integration |
|-----------|---------------------|----------------------|---------------------|----------------------|----------------------|
|           | ADF Test Statistics | Test Critical Values | ADF Test Statistics | Test Critical Values |                      |
| AGRCI     | -3.101              | -2.931               |                     |                      | I(0)                 |
| FINCI     | -2.502              | -2.948               | -3.28               | -2.94                | I(1)                 |
| INDCI     | -6.904              | -3.592               |                     |                      | I(0)                 |
| SEVCI     | -5.366              | -3.592               |                     |                      | I(0)                 |
| SHRCI     | -2.003              | -2.931               | -5.481              | -3.6                 | I(1)                 |
| AGRP      | -15.534             | -3.601               |                     |                      | I(0)                 |
| FINP      | -1.979              | -2.937               | -14.264             | -3.6                 | I(1)                 |
| INDP      | -1.894              | -2.937               | -10.998             | -3.61                | I(1)                 |
| SEVP      | -1.156              | -2.939               | -34.254             | -3.6                 | I(1)                 |
| SHRP      | -6.291              | -3.592               |                     |                      | I(0)                 |
| GDP       | -1.958              | -2.939               | -1.809              | -2.938               | NA                   |
| INF       | -1.985              | -2.938               | -2.337              | -1.95                | I(1)                 |
| EXR       | -2.428              | -2.937               | -2.491              | -1.949               | I(1)                 |
| FOP       | -2.933              | -2.931               | -5.332              | -4.205               | I(1)                 |
| GFC       | -3.213              | -2.931               | -6.735              | -3.6                 | I(1)                 |
| USDR      | 0.287               | -2.61                | -4.198              | -3.615               | I(1)                 |

Note: Level of significance is at 1% and 5%

Source: Author's computation, 2022

#### 4.2.1 Co-integration Test

The co-integration test is carried out to check the long-run relationship among the variables for each of the sectoral analysis. The combination of the variables are  $I(0)$  and  $I(1)$ . The popular Auger-Granger approach to co-integration is used, thus all variable are  $I(1)$  variables. The ordinary least squares is used to estimate, then the residuals is generated, the unit root is tested if the results are stationary at levels, then the variables are long-run model.

All the variables are stationary at 5% significance at first difference except the GDP. However, the variable was not further differenced, that is it remains differenced at first difference but not significant at the popularly acceptable 5% level. Nevertheless, since it is an important variable that affects capital inflows it remains included in the analysis.

**Table 5: Summary of Co-integration Tests and ECM of Capital Inflows for the Sectors**

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| Variables | ECM Results |             | ADF Tests |           |           |
|-----------|-------------|-------------|-----------|-----------|-----------|
|           | Coefficient | t-Statistic | *         | **        | ***       |
| AGRCI     | -1.047474   | -6.424569   | -2.619851 | -1.948686 | -1.612036 |
| FINCI     | -4.548311   | -4.548311   | -3.592462 | -2.931404 | -2.603944 |
| INDCI     | -1.217316   | -8.513275   | -3.592462 | -2.931404 | -2.603944 |
| SEVCI     | -1.128331   | -7.257859   | -3.592462 | -2.931404 | -2.603944 |
| SHRCI     | -0.637568   | -4.37011    | -3.592462 | -2.931404 | -2.603944 |

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Note: Level of significance is denoted as \*, \*\* and \*\*\* at 1%, 5% and 10%  
Source: Author's computation, 2022

### **4.3 Effect of Sectoral Performance on Capital Inflows to the Sectors in Nigeria**

To analyse the effect of effect of sectoral performance on capital inflows to the sectors in Nigeria, a simultaneous equation is carried upon the created model identified in the previous chapter on the different sectors. A Three-stage least-squares regression is carried out on the models. The three-stage least-squares regression has been identified in empirical literature as more efficient compared to the two-stage least-squares regression or the ordinary least-squares regression. Nevertheless, the study employs the both, below is the presentation of the simultaneous equations using the Three-stage least-squares while the Two-stage least-squares is presented in the appendix.

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**Table 6: Summary of Simultaneous Equation of the Various Sectors**

| Equation | Obs | Parms | RMSE      | "R-sq" | chi2   | P      |
|----------|-----|-------|-----------|--------|--------|--------|
| AgrP     | 44  | 5     | 0.1726232 | 0.0385 | 4.22   | 0.5181 |
| AgrCI    | 44  | 7     | 38.25953  | 0.5096 | 49.06  | 0      |
| FinP     | 44  | 5     | 0.1591794 | 0.0725 | 5.85   | 0.3207 |
| FinCI    | 44  | 7     | 686.6115  | 0.5953 | 68.32  | 0      |
| IndP     | 44  | 5     | 0.09011   | 0.1989 | 17.15  | 0.0042 |
| IndCI    | 44  | 7     | 120.8794  | 0.2149 | 18.36  | 0.0105 |
| SevP     | 44  | 5     | 0.064106  | 0.1176 | 6.18   | 0.2887 |
| SevCI    | 44  | 7     | 213.471   | 0.3527 | 24.33  | 0.001  |
| ShrP     | 44  | 5     | 1087.354  | 0.1166 | 5.91   | 0.3146 |
| ShrCI    | 44  | 7     | 757.3684  | 0.7579 | 137.95 | 0      |

**Source:** Author's computation, 2022

### 4.3.1 Discussion of Findings

Results for the simultaneous equation of models were quite interesting for the different sectors. The simultaneous equation of models carried out analyzed the peculiar effect of sectoral performance on sectoral capital inflows. The other exogenous and endogenous variables revealed certain results of each variable (endogenous and exogenous) on the dependent variables. Nevertheless, discussion is limited to the effect of sectoral performance on sectoral capital inflows. In the following paragraphs, the different sectors stimulated results is discussed.

Result for the sectoral agricultural performance and the agricultural sectoral capital inflows, which are the dependent variables of different models with other endogenous and exogenous variables results for the first model, are shown that for 1% increase in agricultural sectoral capital inflows, there is a 0.09% reduction in the agricultural sectoral performance. This could be as a result of the agricultural sector not fully regulated, thus, capital injection and output cannot be really quantified but only estimated. However, in the second model, results are that if there is a 1% change in agricultural sectoral performance, agricultural capital inflows is reduced by 63%. The second results are in line with the author's assumption that sectoral performance affects capital inflows for the sector, but in this case, services sectoral performance affects services sectoral capital inflows negatively, owing to the fact that food prices are not stable and investors want to put their capital in sectors that makes profit by their analysis.

Result for the financial sectoral performance and the financial sectoral capital inflows, which are the dependent variables of different models with other endogenous and exogenous variables results for the first model, are shown that for 1% increase in financial sectoral capital inflows, there is a 0.04% increase in the financial sectoral performance. The results here are acceptable since capital theoretically flows into countries with good financial

institutions. However, in the second model, results are that if there is a 1% change in financial sectoral performance, financial capital inflows increases by 133.8%. This results are acceptable especially when the coefficients of United States lending rates and global financial cycle which have been noted in literature as affecting capital inflows.

In the analysis for industrial sectoral performance and the industrial sectoral capital inflows, which are the dependent variables of different models with other endogenous and exogenous variables results for the first model, are shown that for 1% increase in industrial sectoral capital inflows, there is a 0.02% decrease in the industrial sectoral performance. However, for a 1% increase in industrial sectoral performance, there is a 44.8% reduction in sectoral capital inflows.

For the sectoral services performance and the services sectoral capital inflows, which are the dependent variables of different models with other endogenous and exogenous variables results for the first model are shown that for 1% increase in services sectoral capital inflows, there is a 0.02% reduction in the services sectoral performance. The first model's result could be simply being as a result of the size of the services sector that large inflows could destabilize the market. However, in the second model, results are that if there is a 1% change in services sectoral performance, services capital inflows reduces by 28.6%. The second results are in line with the author's assumption that sectoral performance affects capital inflows for the sector, but in this case, services sectoral performance affects services sectoral capital inflows negatively.

For the sectoral shares performance and the sectoral capital inflows, which are the dependent variables of different models with other endogenous and exogenous variables results for the first model are shown that for 1% increase in shares sectoral capital inflows, there is a 6% reduction in the shares sectoral performance. The first model's result could be simply

interpreted by the law of variables proportion; that once there is increase in the variable factor (such as capital and labour; in this case mostly capital) of production output increases but diminishing returns sets in as a result of continuous addition of variable factor. However, in the second model, results are that if there is a 1% increase in shares sectoral performance, shares capital inflows increases by 18%. The second results are in line with the author's assumption that sectoral performance affects capital inflows for the sector.

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### 4.3.2 Analysis

**Table 7: Summary of the Different Variables Effect on the Various Sectors**

| <b>Variables</b> | <b>Agricultural Sector</b> | <b>Financial Sector</b> | <b>Industrial Sector</b> | <b>Service Sector</b> | <b>Shares Sector</b> |
|------------------|----------------------------|-------------------------|--------------------------|-----------------------|----------------------|
| <b>GDP</b>       | 0.040333                   | 0.247031                | -0.009211                | 0.058202              | 0.11159              |
| <b>Infr</b>      | 2471.023                   | -8652.98                | 1589.22                  | -7458.238             | 7338.138             |
| <b>Fop</b>       | 99.5162                    | 3819.452                | 603.5998                 | -56.3706              | 10278.93             |
| <b>Exr</b>       | -4.835524                  | 25.16185                | 8.827887                 | 16.05013              | -16.69684            |
| <b>USDr</b>      | -114.3478                  | -723.5187               | 38.53046                 | 191.9756              | 556.7038             |
| <b>SP</b>        | 458.0666                   | -4340.118               | -10025.51                | 62019.55              | -0.067512            |
| <b>GFC</b>       | -9.383061                  | 68.36303                | -2.0499                  | 15.12279              | -36.33427            |

**Note:** Coefficient of each variable on the sectors are presented

**Source:** Author's computation, 2022.

#### **4.4 Effect of Pull and Push Factor Determining Capital Inflows Across Sectors in Nigeria**

In the analysis for the second objective which is to evaluate the effect of pull and push factor determining capital inflows across sectors in Nigeria the identified endogenous variables in existing literature is consistent to affect capital inflows in this analysis. More so, the newly introduced variable sectoral performance, equally affects capital inflows. Using the ARDL model to test for long and short run relationship among the variables, results show that there is a long run relationship and short run relationship thus the model is suitable for forecasting capital inflows into sectors. Nevertheless, for the different sectoral analysis, the results validate existing theories as well as show newer facts especially when the individual sectors are considered. The results of the different sectoral capital inflows in fulfillment of the second objective for this thesis is summarized.

For the effect of pull and push factor determining capital inflows in the agricultural sector in Nigeria, the ARDL results show that the dependant variable agricultural capital inflows is affected by GDP to the extent that if there is a 1% increase in GDP, sectoral capital inflow into the agricultural sector increases by 4%. Result of the sectoral performance of the agricultural sector shows that for 1% increase in agricultural sectoral performance, there is 458% increase in capital inflows into the agricultural sector. For 1% increase in inflation, capital inflows increases by 2471%. A 1% increase in financial openness translates to a 99.5% increase in capital inflows to the agricultural sector. A 1% increase in exchange rate results to a 4% reduction of capital inflows into the agricultural sector. For a 1% increase in United States lending rate, sectoral capital inflows for agriculture reduces by 114%. A 1% increase in global financial cycle reduces agricultural capital inflows by 9%.

In the analysis for the effect of pull and push factor determining capital inflows in the Financial sector in Nigeria, the ARDL results show that the dependant variable financial capital inflows is affected by GDP to the extent that if there is a 1% increase in GDP, sectoral capital inflow into the agricultural sector increases by 24%. Result of the sectoral performance of the financial sector shows that for 1% increase in financial sectoral performance, there is 4340% reduction in capital inflows into the financial sector. For 1% increase in inflation, capital inflows reduces by 8652%. A 1% increase in financial openness translates to a 3819% increase in capital inflows to the financial sector. A 1% increase in exchange rate results to a 25% reduction of capital inflows into the financial sector. For a 1% increase in United States lending rate, sectoral capital inflows for financial sector reduces by 723%. A 1% increase in global financial cycle increases financial capital inflows by 68%.

For the effect of pull and push factor determining capital inflows in the industrial sector in Nigeria, the ARDL results show that the dependant variable industrial capital inflows is affected by GDP to the extent that if there is a 1% increase in GDP, sectoral capital inflow into the industrial sector reduces by 0.9%. Result of the sectoral performance of the industrial sector shows that for 1% increase in industrial sectoral performance, there is a 10% reduction in capital inflows into the industrial sector. For 1% increase in inflation, capital inflows reduces by 15%. A 1% increase in financial openness translates to a 60% increase in capital inflows to the industrial sector. A 1% increase in exchange rate results to a 9% increase of capital inflows into the industrial sector. For a 1% increase in United States lending rate, sectoral capital inflows for industrial sector increases by 38%. A 1% increase in global financial cycle reduces industrial capital inflows by 2%.

For the effect of pull and push factor determining capital inflows in the services sector in Nigeria, the ARDL results show that the dependant variable services capital inflows is

affected by GDP to the extent that if there is a 1% increase in GDP, sectoral capital inflow into the services industrial sector increases by 5%. Result of the sectoral performance of the services sector shows that for 1% increase in services sectoral performance, there is a 62019% reduction in capital inflows into the services sector. For 1% increase in inflation, capital inflows reduces by 7498%. A 1% increase in financial openness translates to a 56% decrease in capital inflows to the services sector. A 1% increase in exchange rate results to a 16% increase of capital inflows into the services sector. For a 1% increase in United States lending rate, sectoral capital inflows for services sector increases by 19.1%. A 1% increase in global financial cycle increases services capital inflows by 15%.

For the effect of pull and push factor determining capital inflows in the shares sector in Nigeria, the ARDL results show that the dependant variable shares capital inflows is affected by GDP to the extent that if there is a 1% increase in GDP, sectoral capital inflow into the shares industrial sector increases by 11%. Result of the sectoral performance of the share sector shows that for 1% increase in shares sectoral performance, there is a 6% reduction in capital inflows into the shares sector. For 1% increase in inflation, capital inflows reduces by 73.38%. A 1% increase in financial openness translates to a 10.2% increase in capital inflows to the shares sector. A 1% increase in exchange rate results to a 16% reduction of capital inflows into the shares sector. For a 1% increase in United States lending rate, sectoral capital inflows for shares sector increases by 55.6%. A 1% increase in global financial cycle reduces shares capital inflows by 36%.

## **Chapter Five**

### **Conclusion**

The research aimed to answer how sectoral performance led to capital inflows to the sectors in Nigeria and explain the extent to which pull and push factors determine capital inflows across sectors in Nigeria. For the thesis, the main objective piloted the study as it analyzed the pattern and determinants of capital inflows, whilst the specific objective brought in-depth analysis towards the pattern of capital inflows across sectors in Nigeria, it also provided explanations as to how sectoral performance leads to capital inflows to the different sectors, and examined the pull and push factors that determine capital inflow across sectors in Nigeria. The methodology adopted was based on the conceptual framework drawn upon identified variables in existing literature that affects capital inflows.

#### **5.1 Summary of Findings**

For answers to the objectives of the research, the efforts for the study were fruitful. The first objective was achieved as analysis for the pattern of capital inflows across sectors in Nigeria suggests that capital inflows are sensitive to sectoral performance. An increase in the sectoral performance of sector “A” may attract more capital inflows while a reversal may be the case for sector “B”, other things being equal. Therefore, the null hypothesis piloting the study is rejected, as there is a relationship between sectoral performance and capital inflows.

As regards the second objective, sectoral performance is an under-researched variable that is a key determinant of capital inflows as the analysis of this study proves. Explanations for the second objective of the study based on the analysis of the result suggest that as the sectoral performance increases or decreases, the capital inflows follows suit. This is only natural as

ventures that are observed to gain more profits for investors usually attract investments.

However, some sectors' results showed a reversed result, for as the sectoral performance increased, the sector began to repel capital inflows. This result could be a result of many factors such as government policy, and other critical economic variables such as inflation. The third objective was presented in a bulk part of chapter four, where pull and push factors identified in the existing literature, as well as the sectoral performance introduced by the author, were analyzed.

Capital inflows do not just move into an economy, specifically, they target a sector of that economy to yield returns for the investors. In the study, results show that the sectoral performance is a true catalyst for capital inflows to the sector. However, the results vary among the sectors especially when putting the other independent economic variables into consideration. For some of the sectors such as the financial and shares sector, results conformed to the author's assumption that the sectoral performance is a major catalyst for the sectoral capital inflows. For these sectors, it could be as a result of their activities being entirely dependent on the inflows and outflows of money. While in the remaining three sectors, agricultural, industrial, and services sectors, the sectoral performance affects them negatively, as an increase in these sectors' performances reduces sectoral capital inflows, this could be owing to the fact that the remaining sectors deal with the overwhelming presence of human capital whose activities can be sometimes unexpected such as strike actions, change in taste and migration that could significantly affect the sectoral capital inflows.

For the results of push and pull factors that affect capital inflows, all the identified variables used in the study are sectoral performance, GDP, exchange rate, inflation rate, financial openness, United States lending rate, and global financial cycle. All the variables results are critical for

capital inflows but inflation negatively affects all sectors as it reduced the capital inflows. Nevertheless, all the variables hold to their reputation as the determinant of capital inflows, thus for the sector-specific variables, all the determinant of capital inflows affects each of the sectors differently.

The results of the analysis carried out for the agricultural sector revealed that the different variables affected capital inflows with varying impacts. The agricultural sector's performance had a positive impact on capital inflows into the sector. The GDP had little effect on capital inflows to the sector. Interestingly, inflation had a high impact on capital inflows to the sector; this could be as a result of investors' confidence in the persistent change in food prices. More so, financial openness had a significant impact on capital inflows, for economic openness allows investors to critically evaluate an economy and this boosts investors' confidence and attracts capital inflows. The exchange rate also had a positive impact on capital inflows, but the level was low compared to financial openness, and inflation rate. As an increase in the United States lending rate has been identified in the literature as affecting capital inflows, it holds for the agricultural sector as the increase in the United States lending rates significantly increases capital inflows into the sector. More so, the global financial cycle affects significantly capital inflows into the agricultural sector.

Analysis for the financial sector revealed that the different variables affected capital inflows with varying impacts. Surprisingly, the financial sector's performance hurt capital inflows into the sector- the negative impact cannot be explained as improvement in the sectoral performance is supposed to attract capital inflows but results suggest differently, however, the author has an assumption that if the financial sector's performance of an emerging economy such as Nigeria increases, it may deter foreign investors from directing capital inflows into such economy as a

result of fear of the possibility of low marginal output owing to exponential growth experienced previously. The GDP has a positive effect on capital inflows to the sector. Interestingly, inflation had a highly negative impact on capital inflows to the sector. More so, financial openness had a significant positive impact on capital inflows, for economic openness allows investors to critically evaluate an economy and this boosts investors' confidence and attracts capital inflows. The exchange rate also had a positive impact on capital inflows. As an increase in the United States lending rate has been identified in the literature as affecting capital inflows, it holds for the financial sector as the increase in the United States lending rates, however, reduces capital inflows into the sector. More so, the global financial cycle affects significantly capital inflows into the financial sector.

The results of the analysis carried out for the industrial sector revealed that the different variables affected capital inflows with varying impacts. Surprisingly, the industrial sector's performance had a very significant negative impact on the capital inflows into the sector- the negative impact could be a result of investors' sentiment as they may evaluate that the current increase in the sectors' performance may not be able to handle more capital inflows. The GDP has a negative effect on capital inflows to the sector. Interestingly, inflation had a high impact on capital inflows to the sector; this could be as a result of investors' confidence in the persistent change in the price level. More so, financial openness had a significant impact on capital inflows, for economic openness allows investors to critically evaluate an economy and this boosts investors' confidence and attracts capital inflows. The exchange rate also had a positive impact on capital inflows, but the level was low compared to industrial openness, and inflation rate. As an increase in United States lending rate has been identified in the literature as affecting capital inflows, it holds for the industrial sector as the increase in the United States lending rates significantly increases capital inflows into the sector- capital inflows as a result of an increase in the United

States lending rates seems to prefer industrial sectors. More so, the global financial cycle affects negatively capital inflows into the industrial sector.

The results of the analysis carried out for the services sector revealed that the different variables affected capital inflows with varying impacts. Surprisingly, the services sector's performance had a very high significant impact on capital inflows into the sector- the positive impact as sectoral performance attracts capital inflows: a current trend in the country is the increase of delivery, and transport service providers, operated by domestic and international firms. The GDP had a positive effect on capital inflows to the sector. Interestingly, inflation had a highly negative impact on capital inflows to the sector; this could be as a result of unexpected changes in prices of spare parts used for machines, among other conditions. More so, financial openness had a negative impact on capital inflows. The exchange rate also had a positive impact on capital inflows; this was anticipated as foreign investors are able to buy more machines that in turn increases capital inflows into the economy. As an increase in the United States lending rate has been identified in literature as affecting capital inflows, it holds for the services sector as the increase in the United States lending rates significantly increases capital inflows into the sector. More so, the global financial cycle affects significantly capital inflows into the services sector.

The results of the analysis carried out for the shares sector revealed that the different variables affected capital inflows with varying impacts. Surprisingly, the shares sectoral performance hurt capital inflows into the sector- the negative impact cannot be explained as improvement in the sectoral performance is supposed to attract capital inflows but results suggest differently. The GDP had little effect on capital inflows to the sector. Interestingly, inflation had a high impact on capital inflows to the sector; this could be as a result of investors' confidence in the persistent change in food prices. More so, financial openness had a high significant impact on capital

inflows, for economic openness allows investors to critically evaluate an economy and this boosts investors' confidence and attracts capital inflows. The exchange rate also had a negative impact on capital inflows. As an increase in the United States lending rate has been identified in literature as affecting capital inflows, it holds for the shares sector as the increase in the United States lending rates significantly increases capital inflows into the sector. More so, the global financial cycle has a negative impact on capital inflows into the shares sector.

## **5.2 Conclusion**

The existing body of literature considers only a few endogenous and exogenous variables as affecting capital inflows. There was limited literature in direct relation to this study as many of the sectors investigated by existing literature as fixated on a type of capital inflow, while this study used net capital inflows. During analysis, all the variables identified in existing literature as affecting capital inflows turned out positive. Nonetheless, the credibility of GDP as a determinant of capital inflows may not be valid as the variable has no unit root, therefore depending on this variable as a key determinant may have resulted in a spurious regression. The gap filled by this study was not only to test the viability of the identified variables that affect capital inflows, this study also shed light that capital inflows do not just flow into an economy as existing literature puts it, but go into the different sectors that make up the economy. More so, it added a new variable, that is the sectoral performance, which analysis has shown is a key determinant of capital inflows. With the empirical results, it is now a fact that a sector's performance affects the sectoral capital inflows, however, the sectors have various responses to capital inflows as a result of the sectoral performance.

### 5.3 Recommendations

The push factors are uncontrollable, however, policymakers, industrialists, and businesses have to increase efforts in the pull factors with the use of cutting edge technology, reduce waste to increase the sectoral performance of any sector they wish to attract more capital inflows. More so, inflation has to be regulated within a benchmark that keeps capital inflows steady. Stabilization of the exchange rates needs to be facilitated to encourage capital inflows where this variable is a critical factor.

A replication of the model is highly recommended as it allows policymakers to critically analyze the different sectors to know which variable can be corrected to increase the chances of capital inflows into a choice sector. In the long run, the government can develop an economic plan that aims to sectorize the economy to help improve capital inflows to the sectors: sectorize in this sense means the application of the pecking order theory, in this case by government; to focus on certain sectors of the economy one after the other until the first sector and its sub-sectors are fully sufficient and sustainable, then move to the next to the last for total development.

In addition, as capital inflows towards the financial sector are highly impacted by the sectoral performance, the government can engage directly into the sector and improve it even more, as capital inflows tends to flow into the economy, thus with monetary policies, the government can borrow from the financial sector to invest into the other sectors. More so, the government should consider commercialization of all her enterprises, by doing so, there will be a significant increase in performance of the individual sectors these commercialized enterprises operates in and empirical findings suggests that sectoral performance increases sectoral capital inflows.

#### **5.4 Contribution to Knowledge**

The trend of research has focused on pull and push factors that affect capital inflows, these determinants of capital inflows are notably the GDP, financial and trade openness, exchange rate, inflation, global financial cycle, and the United States lending rates. Policymakers have always faced the problem of how capital inflows can be attracted and are more likely concerned about endogenous factors (the variable they can control) and a little bit less concerned about the exogenous variables (variables they have no control over). This study shows that endogenous factors are critical when it comes to the determinants of capital inflows, and reveals the pattern of capital inflows to be sectoral.

This study lends support to the pull factors as major determinants of capital inflows. Empirical results shows that the endogenous variables are significant in attracting sectoral capital inflows as they determine the level of investment inflows. Nevertheless, the efficacy and opportunity that the push factors create in directing capital inflows into the domestic economy is highly significant. More so, the domestic economy tends to attract more capital inflows when the two determinants - push and pull factors are in synergy but benefits and opportunities they bring depends on government policies that will either attract or repel capital inflows to the sectors..

In this study, the pattern suggests that any sector with relatively high performance gets more capital inflows compared with sectors with lower performance. This study is novel as it brings to light that sectoral performance is a critical factor that affects capital inflows in the Nigerian economy. Nevertheless, there is a need for more analysis to be done to truly establish the sectoral performance as a key determinant for capital inflows.

## 5.5 Area of Further Research

The results show that sectoral performance is a major determinant of capital inflows in Nigeria. Nevertheless, more research needs to be done for different types of economies that are advanced, developing, and emerging countries to get comparative results on how the sectoral performance affects sectoral capital inflows. More so, a panel study should be carried out on countries within the same economic bloc as results may be insightful and will generate a new string of research. In addition, this study's conceptual framework, regional factor, that is spillover is accounted to affect capital inflows but was not included in the analysis as there was no framework (during the period of study) to put into data accurately spillover effect for economic blocs, thus, researchers should look into the possibility of generating a framework for calculating spill over and with the same model (or a modified one) re-analyze to have more robust results. In addition, this study used net capital inflows, thus, newer studies should use a particular type of capital inflow such as FPI, FDI, etc, and analyze the impact of the sectoral performance on the different sectors- results may be very controversial.

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## Appendices

**Table 1:** Average capital inflow from 1978-2017 for some selected African countries

| Period    | Capital Inflows |            |           |           |              |           |
|-----------|-----------------|------------|-----------|-----------|--------------|-----------|
|           | Ghana           | Benin Rep. | Cameroon  | Egypt     | South Africa | Nigeria   |
|           | \$000,000       | \$000,000  | \$000,000 | \$000,000 | \$000,000    | \$000,000 |
| 1978-1987 | 316149238       | 15176330   | 70373530  | 38172500  | 351865425    | 474950570 |
| 1988-1997 | 311474357       | 16039352   | 64837348  | 47308750  | 424869142    | 537275898 |
| 1998-2007 | 313811798       | 15607841   | 67605439  | 42740625  | 388367283    | 506113234 |
| 2008-2017 | 313811798       | 15607841   | 67605439  | 42740625  | 388367283    | 506113234 |

*Source:* Author's computation from data of WDI, 2021 and CBN, 2020

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## Simultaneous Equations

Two-stage least-squares regression

| Equation | Obs | Parms | RMSE     | "R-sq" | F-Stat | P      |
|----------|-----|-------|----------|--------|--------|--------|
| AgrP     | 44  | 5     | .1847048 | 0.0493 | 0.39   | 0.8514 |
| AgrCI    | 44  | 7     | 41.97202 | 0.5171 | 5.51   | 0.0000 |

|              |       | Coef.     | Std. Err. | t     | P> t  | [95% Conf. Interval] |
|--------------|-------|-----------|-----------|-------|-------|----------------------|
| <b>AgrP</b>  |       |           |           |       |       |                      |
|              | AgrCI | -.0005746 | .0006227  | -0.92 | 0.359 | -.0018154 .0006662   |
|              | Gdp   | .0000104  | .0000191  | 0.55  | 0.586 | -.0000276 .0000485   |
|              | Inf   | 1.228706  | 2.908612  | 0.42  | 0.674 | -4.56683 7.024241    |
|              | Fop   | -.025486  | .2647162  | -0.10 | 0.924 | -.5529446 .5019725   |
|              | Exr   | .0023208  | .0029214  | 0.79  | 0.429 | -.0035002 .0081418   |
|              | _cons | -.3404958 | .4560145  | -0.75 | 0.458 | -1.249125 .568133    |
| <b>AgrCI</b> |       |           |           |       |       |                      |
|              | AgrP  | -36.25598 | 36.5699   | -0.99 | 0.325 | -109.1231 36.61114   |
|              | Gdp   | .0117128  | .0047649  | 2.46  | 0.016 | .0022185 .0212071    |
|              | Inf   | 292.7238  | 662.0166  | 0.44  | 0.660 | -1026.373 1611.821   |
|              | Fop   | 130.6828  | 60.37677  | 2.16  | 0.034 | 10.3795 250.9862     |
|              | Exr   | .0066262  | .8846263  | 0.01  | 0.994 | -1.75603 1.769283    |
|              | USDr  | 21.23378  | 12.40302  | 1.71  | 0.091 | -3.47978 45.94734    |
|              | GFC   | 3.383605  | 1.139309  | 2.97  | 0.004 | 1.113483 5.653727    |
|              | _cons | -259.6947 | 134.2333  | -1.93 | 0.057 | -527.1604 7.771064   |

Endogenous variables:

Exogenous variables: AgrP AgrCI Gdp Inf Fop Exr USDr GFC

**Source:** Author's computation (Stata output), 2022

Two-stage least-squares regression

| Equation | Obs | Parms | RMSE     | "R-sq" | F-Stat | P      |
|----------|-----|-------|----------|--------|--------|--------|
| FinP     | 44  | 5     | .170373  | 0.0824 | 0.68   | 0.6384 |
| FinCI    | 44  | 7     | 753.2517 | 0.6015 | 7.76   | 0.0000 |

|       |       | Coef.     | Std. Err. | t        | P> t  | [95% Conf. Interval] |
|-------|-------|-----------|-----------|----------|-------|----------------------|
| FinP  | FinCI | .0000295  | .0000312  | 0.95     | 0.347 | -0.000326 .0000916   |
|       | Gdp   | -.0000104 | .0000159  | -0.66    | 0.514 | -.0000421 .0000213   |
|       | Inf   | 2.005168  | 2.683611  | 0.75     | 0.457 | -3.342044 7.35238    |
|       | Fop   | .1562898  | .2853493  | 0.55     | 0.586 | -.4122811 .7248608   |
|       | Exr   | -.00185   | .0026036  | -0.71    | 0.480 | -.0070378 .0033378   |
|       | _cons | .209573   | .3818009  | 0.55     | 0.585 | -.551182 .9703279    |
|       | FinCI | FinP      | 815.2458  | 709.0526 | 1.15  | 0.254                |
| Gdp   |       | .1571196  | .0854377  | 1.84     | 0.070 | -.0131187 .3273579   |
| Inf   |       | 4235.49   | 11967.33  | 0.35     | 0.724 | -19609.94 28080.92   |
| Fop   |       | 5515.327  | 1107.154  | 4.98     | 0.000 | 3309.274 7721.38     |
| Exr   |       | -3.847466 | 15.80433  | -0.24    | 0.808 | -35.33829 27.64336   |
| USDr  |       | 83.0413   | 221.9979  | 0.37     | 0.709 | -359.2992 525.3818   |
| GFC   |       | 78.99207  | 20.43748  | 3.87     | 0.000 | 38.2695 119.7147     |
| _cons |       | -4115.459 | 2398.865  | -1.72    | 0.090 | -8895.302 664.3851   |

Endogenous variables:

Exogenous variables: FinP FinCI Gdp Inf Fop Exr USDr GFC

**Source:** Author's computation (Stata output), 2022

Two-stage least-squares regression

| Equation | Obs | Parms | RMSE     | "R-sq" | F-Stat | P      |
|----------|-----|-------|----------|--------|--------|--------|
| IndP     | 44  | 5     | .0955037 | 0.2228 | 2.18   | 0.0655 |
| IndCI    | 44  | 7     | 131.5722 | 0.2390 | 1.62   | 0.1444 |

|              | Coef.      | Std. Err. | t     | P> t  | [95% Conf. Interval] | [Interval] |
|--------------|------------|-----------|-------|-------|----------------------|------------|
| <b>IndP</b>  |            |           |       |       |                      |            |
| IndCI        | -.0001396  | .0001173  | -1.19 | 0.238 | -.0003733            | .0000942   |
| Gdp          | -.0000167  | 9.07e-06  | -1.84 | 0.070 | -.0000348            | 1.37e-06   |
| Inf          | 2.245868   | 1.513021  | 1.48  | 0.142 | -.7688923            | 5.260628   |
| Fop          | .287219    | .1333346  | 2.15  | 0.034 | .021544              | .5528941   |
| Exr          | -.0005132  | .0014939  | -0.34 | 0.732 | -.0034897            | .0024634   |
| _cons        | .2219224   | .2146971  | 1.03  | 0.305 | -.2058708            | .6497157   |
| <b>IndCI</b> |            |           |       |       |                      |            |
| IndP         | -.211.9626 | 226.5979  | -0.94 | 0.353 | -663.4687            | 239.5435   |
| Gdp          | .0290488   | .0164292  | 1.77  | 0.081 | -.0036871            | .0617846   |
| Inf          | 2330.63    | 2111.561  | 1.10  | 0.273 | -1876.748            | 6538.008   |
| Fop          | 447.5239   | 192.7225  | 2.32  | 0.023 | 63.51584             | 831.5319   |
| Exr          | 4.011731   | 2.838745  | 1.41  | 0.162 | -1.644591            | 9.668053   |
| USDr         | -31.9348   | 40.03699  | -0.80 | 0.428 | -111.7102            | 47.84064   |
| GFC          | 2.146191   | 3.570984  | 0.60  | 0.550 | -4.969149            | 9.261531   |
| _cons        | -.714.34   | 442.7302  | -1.61 | 0.111 | -1596.499            | 167.8192   |

Endogenous variables:

Exogenous variables: IndP IndCI Gdp Inf Fop Exr USDr GFC

**Source:** Author's computation (Stata output), 2022

Two-stage least-squares regression

| Equation | Obs | Parms | RMSE     | "R-sq" | F-Stat | P      |
|----------|-----|-------|----------|--------|--------|--------|
| SevP     | 44  | 5     | .0689223 | 0.1191 | 1.03   | 0.4076 |
| SevCI    | 44  | 7     | 235.7915 | 0.3538 | 2.82   | 0.0117 |

|       |       | Coef.     | Std. Err. | t        | P> t  | [95% Conf. Interval] |
|-------|-------|-----------|-----------|----------|-------|----------------------|
| SevP  | SevCI | -.0000127 | .0000479  | -0.27    | 0.791 | [-.0001081 .0000827] |
|       | Gdp   | .0000105  | 6.97e-06  | 1.50     | 0.137 | [-3.42e-06 .0000243] |
|       | Inf   | -1.542839 | 1.081188  | -1.43    | 0.158 | [-3.697154 .6114757] |
|       | Fop   | -.0425103 | .0992898  | -0.43    | 0.670 | [-.2403495 .155329]  |
|       | Exr   | -.0002927 | .0010524  | -0.28    | 0.782 | [-.0023897 .0018043] |
|       | _cons | -.0873387 | .1538212  | -0.57    | 0.572 | [-.3938341 .2191567] |
|       | SevCI | SevP      | -146.3382 | 557.4577 | -0.26 | 0.794                |
| Gdp   |       | .0780743  | .0275721  | 2.83     | 0.006 | [.0231358 .1330129]  |
| Inf   |       | -320.8919 | 3803.215  | -0.08    | 0.933 | [-7898.964 7257.18]  |
| Fop   |       | 856.5756  | 339.4382  | 2.52     | 0.014 | [180.2302 1532.921]  |
| Exr   |       | .1111333  | 4.940234  | 0.02     | 0.982 | [-9.732497 9.954763] |
| USDr  |       | -30.94495 | 69.80122  | -0.44    | 0.659 | [-170.0269 108.137]  |
| GFC   |       | 6.760133  | 6.400453  | 1.06     | 0.294 | [-5.993048 19.51331] |
| _cons |       | -1154.923 | 756.0461  | -1.53    | 0.131 | [-2661.378 351.5318] |

Endogenous variables:

Exogenous variables: SevP SevCI Gdp Inf Fop Exr USDr GFC

**Source:** Author's computation (Stata output), 2022

Two-stage least-squares regression

| Equation | Obs | Parms | RMSE     | "R-sq" | F-Stat | P      |
|----------|-----|-------|----------|--------|--------|--------|
| ShrP     | 44  | 5     | 1169.766 | 0.1170 | 1.01   | 0.4195 |
| ShrCI    | 44  | 7     | 837.0168 | 0.7581 | 16.11  | 0.0000 |

|       |       | Coef.     | Std. Err. | t     | P> t  | [95% Conf. Interval]   |
|-------|-------|-----------|-----------|-------|-------|------------------------|
| ShrP  |       |           |           |       |       |                        |
|       | ShrCI | -.0375373 | .1977048  | -0.19 | 0.850 | [-.4314727, .3563982]  |
|       | Gdp   | .0833565  | .1059899  | 0.79  | 0.434 | [-.1278329, .2945459]  |
|       | Inf   | -20912.51 | 18521.46  | -1.13 | 0.263 | [-57817.32, 15992.29]  |
|       | Fop   | -2863.28  | 2408.507  | -1.19 | 0.238 | [-7662.335, 1935.775]  |
|       | Exr   | 3.944869  | 17.86498  | 0.22  | 0.826 | [-31.65188, 39.54162]  |
|       | _cons | -417.0819 | 2555.856  | -0.16 | 0.871 | [-5509.735, 4675.572]  |
| ShrCI |       |           |           |       |       |                        |
|       | ShrP  | .036542   | .1174121  | 0.31  | 0.757 | [-.1974067, .2704906]  |
|       | Gdp   | -.1107465 | .0951813  | -1.16 | 0.248 | [-.3003993, .0789064]  |
|       | Inf   | -10527.27 | 13416.64  | -0.78 | 0.435 | [-37260.51, 16205.97]  |
|       | Fop   | 8958.645  | 1263.714  | 7.09  | 0.000 | [.6440.64, 11476.65]   |
|       | Exr   | 1.976104  | 17.5312   | 0.11  | 0.911 | [-32.95557, 36.90778]  |
|       | USDr  | 6.011294  | 247.091   | 0.02  | 0.981 | [-486.3282, 498.3508]  |
|       | GFC   | -85.26196 | 22.92186  | -3.72 | 0.000 | [-130.9348, -39.58916] |
|       | _cons | 3417.48   | 2664.835  | 1.28  | 0.204 | [-1892.32, 8727.28]    |

Endogenous variables:

Exogenous variables: ShrP ShrCI Gdp Inf Fop Exr USDr GFC

**Source:** Author's computation (Stata output), 2022

Three-stage least-squares regression

| Equation | Obs | Parms | RMSE     | "R-sq" | chi2  | P      |
|----------|-----|-------|----------|--------|-------|--------|
| AgrP     | 44  | 5     | .1726232 | 0.0385 | 4.22  | 0.5181 |
| AgrCI    | 44  | 7     | 38.25953 | 0.5096 | 49.06 | 0.0000 |

|              | Coef.     | Std. Err. | z     | P> z  | [95% Conf. Interval]   |  |
|--------------|-----------|-----------|-------|-------|------------------------|--|
| <b>AgrP</b>  |           |           |       |       |                        |  |
| AgrCI        | -.000984  | .0005753  | -1.71 | 0.087 | [-.0021116, .0001437]  |  |
| Gdp          | .0000167  | .0000177  | 0.94  | 0.347 | [-.0000181, .0000514]  |  |
| Inf          | 1.396169  | 2.702911  | 0.52  | 0.605 | [-3.90144, 6.693777]   |  |
| Fop          | .0376795  | .2458165  | 0.15  | 0.878 | [-.4441121, .519471]   |  |
| Exr          | .0028267  | .0027138  | 1.04  | 0.298 | [-.0024923, .0081456]  |  |
| _cons        | -.4846679 | .42321    | -1.15 | 0.252 | [-1.314144, .3448084]  |  |
| <b>AgrCI</b> |           |           |       |       |                        |  |
| AgrP         | -63.36191 | 32.81574  | -1.93 | 0.054 | [-127.6796, .9557666]  |  |
| Gdp          | .0118572  | .0042973  | 2.76  | 0.006 | [-.0034346, .0202798]  |  |
| Inf          | 323.8721  | 598.767   | 0.54  | 0.589 | [-849.6896, 1497.434]  |  |
| Fop          | 128.1275  | 54.55321  | 2.35  | 0.019 | [21.20517, 235.0498]   |  |
| Exr          | .0858966  | .7973411  | 0.11  | 0.914 | [-1.476863, 1.648656]  |  |
| USDr         | 20.64649  | 11.13328  | 1.85  | 0.064 | [-1.174345, 42.46733]  |  |
| GFC          | 3.290021  | 1.023651  | 3.21  | 0.001 | [1.283702, 5.29634]    |  |
| _cons        | -266.1354 | 120.8953  | -2.20 | 0.028 | [-503.0859, -29.18484] |  |

Endogenous variables:

Exogenous variables: AgrP AgrCI Gdp Inf Fop Exr USDr GFC

Source: Author's computation (Stata output), 2022

Three-stage least-squares regression

| Equation | Obs | Parms | RMSE     | "R-sq" | chi2  | P      |
|----------|-----|-------|----------|--------|-------|--------|
| FinP     | 44  | 5     | .1591794 | 0.0725 | 5.85  | 0.3207 |
| FinCI    | 44  | 7     | 686.6115 | 0.5953 | 68.32 | 0.0000 |

|       |       | Coef.     | Std. Err. | z     | P> z  | [95% Conf. | Interval] |
|-------|-------|-----------|-----------|-------|-------|------------|-----------|
| FinP  |       |           |           |       |       |            |           |
|       | FinCI | .0000494  | .0000288  | 1.71  | 0.086 | -7.06e-06  | .0001058  |
|       | Gdp   | -.0000132 | .0000148  | -0.90 | 0.371 | -.0000422  | .0000157  |
|       | Inf   | 1.850092  | 2.493822  | 0.74  | 0.458 | -3.037709  | 6.737893  |
|       | Fop   | .0462469  | .2646471  | 0.17  | 0.861 | -.4724519  | .5649457  |
|       | Exr   | -.0019429 | .0024196  | -0.80 | 0.422 | -.0066852  | .0027993  |
|       | _cons | .2727141  | .3546842  | 0.77  | 0.442 | -.422454   | .9678823  |
| FinCI |       |           |           |       |       |            |           |
|       | FinP  | 1338.991  | 636.3132  | 2.10  | 0.035 | 91.83985   | 2586.142  |
|       | Gdp   | .1601055  | .0770491  | 2.08  | 0.038 | .0090921   | .3111189  |
|       | Inf   | 3111.739  | 10822.82  | 0.29  | 0.774 | -18100.59  | 24324.07  |
|       | Fop   | 5341.47   | 1000.052  | 5.34  | 0.000 | 3381.404   | 7301.537  |
|       | Exr   | -2.6835   | 14.24192  | -0.19 | 0.851 | -30.59716  | 25.23016  |
|       | USDr  | 80.80361  | 199.1878  | 0.41  | 0.685 | -309.5972  | 471.2045  |
|       | GFC   | 76.8635   | 18.37912  | 4.18  | 0.000 | 40.8411    | 112.8859  |
|       | _cons | -4153.385 | 2160.499  | -1.92 | 0.055 | -8387.885  | 81.11565  |

Endogenous variables:

Exogenous variables: FinP FinCI Gdp Inf Fop Exr USDr GFC

Source: Author's computation (Stata output), 2022

Three-stage least-squares regression

| Equation | Obs | Parms | RMSE     | "R-sq" | chi2  | P      |
|----------|-----|-------|----------|--------|-------|--------|
| IndP     | 44  | 5     | .09011   | 0.1989 | 17.15 | 0.0042 |
| IndCI    | 44  | 7     | 120.8794 | 0.2149 | 18.36 | 0.0105 |

|       |       | Coef.     | Std. Err. | z     | P> z  | [95% Conf. | Interval] |
|-------|-------|-----------|-----------|-------|-------|------------|-----------|
| IndP  |       |           |           |       |       |            |           |
|       | IndCI | -.0002665 | .0001072  | -2.49 | 0.013 | -.0004766  | -.0000564 |
|       | Gdp   | -.0000135 | 8.41e-06  | -1.60 | 0.109 | -.00003    | 2.99e-06  |
|       | Inf   | 2.474779  | 1.405627  | 1.76  | 0.078 | -.2801997  | 5.229758  |
|       | Fop   | .329283   | .1237366  | 2.66  | 0.008 | .0867638   | .5718022  |
|       | Exr   | -.0001574 | .0013872  | -0.11 | 0.910 | -.0028762  | .0025614  |
|       | _cons | .1592322  | .1992823  | 0.80  | 0.424 | -.231354   | .5498184  |
| IndCI |       |           |           |       |       |            |           |
|       | IndP  | -448.7613 | 201.4241  | -2.23 | 0.026 | -843.5454  | -53.9773  |
|       | Gdp   | .0237191  | .0147348  | 1.61  | 0.107 | -.0051605  | .0525986  |
|       | Inf   | 2795.861  | 1908.54   | 1.46  | 0.143 | -944.8075  | 6536.53   |
|       | Fop   | 500.2345  | 173.836   | 2.88  | 0.004 | 159.5222   | 840.9468  |
|       | Exr   | 3.70392   | 2.545367  | 1.46  | 0.146 | -1.284907  | 8.692747  |
|       | USDr  | -29.79894 | 35.58521  | -0.84 | 0.402 | -99.54468  | 39.9468   |
|       | GFC   | 2.00265   | 3.17352   | 0.63  | 0.528 | -4.217336  | 8.222635  |
|       | _cons | -626.6002 | 396.3759  | -1.58 | 0.114 | -1403.483  | 150.2822  |

Endogenous variables:

Exogenous variables: IndP IndCI Gdp Inf Fop Exr USDr GFC

Source: Author's computation (Stata output), 2022

Three-stage least-squares regression

| Equation | Obs | Parms | RMSE    | "R-sq" | chi2  | P      |
|----------|-----|-------|---------|--------|-------|--------|
| SevP     | 44  | 5     | .064106 | 0.1176 | 6.18  | 0.2887 |
| SevCI    | 44  | 7     | 213.471 | 0.3527 | 24.33 | 0.0010 |

|       | Coef.     | Std. Err. | z     | P> z  | [95% Conf. | Interval] |
|-------|-----------|-----------|-------|-------|------------|-----------|
| SevP  |           |           |       |       |            |           |
| SevCI | -.0000249 | .0000444  | -0.56 | 0.575 | -.000112   | .0000622  |
| Gdp   | .0000113  | 6.47e-06  | 1.74  | 0.081 | -1.41e-06  | .000024   |
| Inf   | -1.544252 | 1.00477   | -1.54 | 0.124 | -3.513565  | .4250623  |
| Fop   | -.0329917 | .0922609  | -0.36 | 0.721 | -.2138197  | .1478362  |
| Exr   | -.0003032 | .000978   | -0.31 | 0.757 | -.0022201  | .0016137  |
| _cons | -.0969132 | .1429419  | -0.68 | 0.498 | -.3770741  | .1832477  |
| SevCI |           |           |       |       |            |           |
| SevP  | -286.6207 | 503.7894  | -0.57 | 0.569 | -1274.03   | 700.7883  |
| Gdp   | .0793887  | .0249308  | 3.18  | 0.001 | .0305252   | .1282522  |
| Inf   | -537.1902 | 3439.971  | -0.16 | 0.876 | -7279.41   | 6205.03   |
| Fop   | 848.9238  | 306.9955  | 2.77  | 0.006 | 247.2237   | 1450.624  |
| Exr   | .068054   | 4.466737  | 0.02  | 0.988 | -8.68659   | 8.822698  |
| USDr  | -30.83633 | 63.08141  | -0.49 | 0.625 | -154.4736  | 92.80097  |
| GFC   | 6.736404  | 5.784404  | 1.16  | 0.244 | -4.60082   | 18.07363  |
| _cons | -1164.514 | 683.5406  | -1.70 | 0.088 | -2504.229  | 175.2008  |

Endogenous variables:

Exogenous variables:           SevP SevCI Gdp Inf Fop Exr USDr GFC

Source: Author's computation (Stata output), 2022

Three-stage least-squares regression

| Equation | Obs | Parms | RMSE     | "R-sq" | chi2   | P      |
|----------|-----|-------|----------|--------|--------|--------|
| ShrP     | 44  | 5     | 1087.354 | 0.1166 | 5.91   | 0.3146 |
| ShrCI    | 44  | 7     | 757.3684 | 0.7579 | 137.95 | 0.0000 |

|       |       | Coef.     | Std. Err. | z     | P> z  | [95% Conf. | Interval] |
|-------|-------|-----------|-----------|-------|-------|------------|-----------|
| ShrP  |       |           |           |       |       |            |           |
|       | ShrCI | -.0645679 | .1836859  | -0.35 | 0.725 | -.4245856  | .2954498  |
|       | Gdp   | .0813708  | .0984981  | 0.83  | 0.409 | -.1116819  | .2744234  |
|       | Inf   | -21256.34 | 17212.29  | -1.23 | 0.217 | -54991.81  | 12479.12  |
|       | Fop   | -2612.642 | 2237.955  | -1.17 | 0.243 | -6998.954  | 1773.67   |
|       | Exr   | 3.839374  | 16.60228  | 0.23  | 0.817 | -28.7005   | 36.37925  |
|       | _cons | -369.5438 | 2375.198  | -0.16 | 0.876 | -5024.846  | 4285.758  |
| ShrCI |       |           |           |       |       |            |           |
|       | ShrP  | .0182914  | .106167   | 0.17  | 0.863 | -.189792   | .2263749  |
|       | Gdp   | -.1091347 | .0860837  | -1.27 | 0.205 | -.2778556  | .0595862  |
|       | Inf   | -10901.92 | 12135.64  | -0.90 | 0.369 | -34687.33  | 12883.49  |
|       | Fop   | 8900.543  | 1142.988  | 7.79  | 0.000 | 6660.328   | 11140.76  |
|       | Exr   | 2.043686  | 15.85503  | 0.13  | 0.897 | -29.03161  | 33.11898  |
|       | USDr  | 6.004227  | 223.4258  | 0.03  | 0.979 | -431.9023  | 443.9108  |
|       | GFC   | -85.16173 | 20.72848  | -4.11 | 0.000 | -125.7888  | -44.53465 |
|       | _cons | 3406.734  | 2409.998  | 1.41  | 0.157 | -1316.774  | 8130.243  |

Endogenous variables:

Exogenous variables: ShrP ShrCI Gdp Inf Fop Exr USDr GFC

Source: Author's computation (Stata output), 2022

## Unit Root Test

Null Hypothesis: AGRCI has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.101269   | 0.0339 |
| Test critical values: 1% level         | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: AGRP has a unit root Exogenous:  
 Constant  
 Lag Length: 2 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -15.53399   | 0.0000 |
| Test critical values: 1% level         | -3.600987   |        |
| 5% level                               | -2.935001   |        |
| 10% level                              | -2.605836   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(FINCI) has a unit root  
 Exogenous: Constant  
 Lag Length: 4 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.280773   | 0.0229 |
| Test critical values: 1% level         | -3.615588   |        |
| 5% level                               | -2.941145   |        |
| 10% level                              | -2.609066   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(FINP) has a unit root  
 Exogenous: Constant  
 Lag Length: 2 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -14.26472   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.605593   |        |
| 5% level                               | -2.936942   |        |
| 10% level                              | -2.606857   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: INDCI has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -6.904297   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(INDP) has a unit root  
 Exogenous: Constant  
 Lag Length: 3 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -10.99864   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.610453   |        |
| 5% level                               | -2.938987   |        |
| 10% level                              | -2.607932   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: SEVCI has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -5.365992   | 0.0001 |
| Test critical values:                  |             |        |
| 1% level                               | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(SEVP) has a unit root  
 Exogenous: Constant  
 Lag Length: 2 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -34.25458   | 0.0001 |
| Test critical values:                  |             |        |
| 1% level                               | -3.605593   |        |
| 5% level                               | -2.936942   |        |
| 10% level                              | -2.606857   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(SHRCI) has a unit root  
 Exogenous: Constant  
 Lag Length: 1 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -5.481490   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.600987   |        |
| 5% level                               | -2.935001   |        |
| 10% level                              | -2.605836   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: SEVP has a unit root  
 Exogenous: Constant  
 Lag Length: 4 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.156213   | 0.6834 |
| Test critical values:                  |             |        |
| 1% level                               | -3.610453   |        |
| 5% level                               | -2.938987   |        |
| 10% level                              | -2.607932   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(GDP) has a unit root  
 Exogenous: Constant  
 Lag Length: 3 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.809016   | 0.3708 |
| Test critical values:                  |             |        |
| 1% level                               | -3.610453   |        |
| 5% level                               | -2.938987   |        |
| 10% level                              | -2.607932   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(EXR) has a unit root  
 Exogenous: None  
 Lag Length: 2 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.491670   | 0.0140 |
| Test critical values:                  |             |        |
| 1% level                               | -2.624057   |        |
| 5% level                               | -1.949319   |        |
| 10% level                              | -1.611711   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(INF) has a unit root  
 Exogenous: None  
 Lag Length: 6 (Automatic - based on AIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.370509   | 0.0191 |
| Test critical values:                  |             |        |
| 1% level                               | -2.630762   |        |
| 5% level                               | -1.950394   |        |
| 10% level                              | -1.611202   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(FOP) has a unit root  
 Exogenous: Constant, Linear Trend  
 Lag Length: 2 (Automatic - based on AIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -5.332105   | 0.0005 |
| Test critical values:                  |             |        |
| 1% level                               | -4.205004   |        |
| 5% level                               | -3.526609   |        |
| 10% level                              | -3.194611   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(USDR) has a unit root  
 Exogenous: Constant  
 Lag Length: 4 (Fixed)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.198441   | 0.0021 |
| Test critical values:                  |             |        |
| 1% level                               | -3.615588   |        |
| 5% level                               | -2.941145   |        |
| 10% level                              | -2.609066   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(GFC) has a unit root  
 Exogenous: Constant  
 Lag Length: 1 (Automatic - based on AIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -6.735002   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.600987   |        |
| 5% level                               | -2.935001   |        |
| 10% level                              | -2.605836   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis:D(AGRCI) has a unit root  
 Exogenous: Constant  
 Lag Length: 2 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -15.53399   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.600987   |        |
| 5% level                               | -2.935001   |        |
| 10% level                              | -2.605836   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: EXR has a unit root  
 Exogenous: Constant  
 Lag Length: 3 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.428260   | 0.1407 |
| Test critical values:                  |             |        |
| 1% level                               | -3.605593   |        |
| 5% level                               | -2.936942   |        |
| 10% level                              | -2.606857   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: FINCI has a unit root  
 Exogenous: Constant  
 Lag Length: 8 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.501877   | 0.1237 |
| Test critical values:                  |             |        |
| 1% level                               | -3.632900   |        |
| 5% level                               | -2.948404   |        |
| 10% level                              | -2.612874   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output 2022*

Null Hypothesis: FINP has a unit root  
 Exogenous: Constant  
 Lag Length: 3 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.978803   | 0.2946 |
| Test critical values:                  |             |        |
| 1% level                               | -3.605593   |        |
| 5% level                               | -2.936942   |        |
| 10% level                              | -2.606857   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: FOP has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.933358   | 0.0498 |
| Test critical values:                  |             |        |
| 1% level                               | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: GDP has a unit root  
 Exogenous: Constant  
 Lag Length: 4 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.957974   | 0.3035 |
| Test critical values:                  |             |        |
| 1% level                               | -3.610453   |        |
| 5% level                               | -2.938987   |        |
| 10% level                              | -2.607932   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: GFC has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -3.212701   | 0.0260 |
| Test critical values:                  |             |        |
| 1% level                               | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(INDCI) has a unit root  
 Exogenous: Constant  
 Lag Length: 1 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -8.938751   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.600987   |        |
| 5% level                               | -2.935001   |        |
| 10% level                              | -2.605836   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: INDP has a unit root  
 Exogenous: Constant  
 Lag Length: 3 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.893537   | 0.3319 |
| Test critical values:                  |             |        |
| 1% level                               | -3.605593   |        |
| 5% level                               | -2.936942   |        |
| 10% level                              | -2.606857   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: INFR has a unit root  
 Exogenous: Constant  
 Lag Length: 4 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -1.985445   | 0.2918 |
| Test critical values:                  |             |        |
| 1% level                               | -3.610453   |        |
| 5% level                               | -2.938987   |        |
| 10% level                              | -2.607932   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(SEVCI) has a unit root  
 Exogenous: Constant  
 Lag Length: 1 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -8.038454   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.600987   |        |
| 5% level                               | -2.935001   |        |
| 10% level                              | -2.605836   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: D(SHRP) has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -10.78018   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.596616   |        |
| 5% level                               | -2.933158   |        |
| 10% level                              | -2.604867   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: SHRCI has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -2.002937   | 0.2846 |
| Test critical values:                  |             |        |
| 1% level                               | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: SHRP has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -6.291232   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Null Hypothesis: USDR has a unit root  
Exogenous: Constant  
Lag Length: 6 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | 0.286545    | 0.9744 |
| Test critical values:                  |             |        |
| 1% level                               | -3.621023   |        |
| 5% level                               | -2.943427   |        |
| 10% level                              | -2.610263   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

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## Cointegration Test and ECM Results

Dependent Variable: AGRCI  
 Method: Least Squares  
 Date: 01/12/22 Time: 23:21  
 Sample: 2010Q1 2020Q4  
 Included observations: 44

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| AGRP     | -36.25598   | 36.56990   | -0.991416   | 0.3281 |
| GDP      | 0.011713    | 0.004765   | 2.458142    | 0.0189 |
| INF      | 292.7238    | 662.0166   | 0.442170    | 0.6610 |
| FOP      | 130.6828    | 60.37677   | 2.164456    | 0.0371 |
| EXR      | 0.006626    | 0.884626   | 0.007490    | 0.9941 |
| USDR     | 21.23378    | 12.40302   | 1.711984    | 0.0955 |
| GFC      | 3.383605    | 1.139309   | 2.969875    | 0.0053 |
| C        | -259.6947   | 134.2333   | -1.934651   | 0.0609 |

Null Hypothesis: ECM1 has a unit root  
 Exogenous: None  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -6.424569   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -2.619851   |        |
| 5% level                               | -1.948686   |        |
| 10% level                              | -1.612036   |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(ECM1)  
 Method: Least Squares  
 Date: 01/12/22 Time: 23:23  
 Sample (adjusted): 2010Q2 2020Q4  
 Included observations: 43 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ECM1(-1) | -1.047474   | 0.163042   | -6.424569   | 0.0000 |

**Source:** *Author's computation Eviews Output, 2022*

The ECM results show it is stationary at the 5% significance level using augmented Dickey-Fuller Test.

Dependent Variable: FINCI  
 Method: Least Squares  
 Date: 01/13/22 Time: 18:16  
 Sample: 2010Q1 2020Q4  
 Included observations: 44

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| FINP     | 815.2458    | 709.0526   | 1.149768    | 0.2578 |
| GDP      | 0.157120    | 0.085438   | 1.838997    | 0.0742 |
| INF      | 4235.490    | 11967.33   | 0.353921    | 0.7255 |
| FOP      | 5515.327    | 1107.154   | 4.981535    | 0.0000 |
| EXR      | -3.847466   | 15.80433   | -0.243444   | 0.8090 |
| USDR     | 83.04130    | 221.9979   | 0.374063    | 0.7106 |
| GFC      | 78.99207    | 20.43748   | 3.865058    | 0.0004 |
| C        | -4115.459   | 2398.865   | -1.715585   | 0.0948 |

Null Hypothesis: ECM2 has a unit root  
 Exogenous: Constant  
 Bandwidth: 0 (Newey-West automatic) using Bartlett kernel

|                                          | Adj. t-Stat | Prob.*   |
|------------------------------------------|-------------|----------|
| Phillips-Perron test statistic           | -4.548311   | 0.0007   |
| Test critical values:                    |             |          |
| 1% level                                 | -3.592462   |          |
| 5% level                                 | -2.931404   |          |
| 10% level                                | -2.603944   |          |
| *MacKinnon (1996) one-sided p-values.    |             |          |
| Residual variance (no correction)        |             | 424943.9 |
| HAC corrected variance (Bartlett kernel) |             | 424943.9 |

**Source:** Author's computation Eviews Output, 2022

Phillips-Perron Test Equation  
 Dependent Variable: D(ECM2)  
 Method: Least Squares  
 Date: 01/13/22 Time: 18:17  
 Sample (adjusted): 2010Q2 2020Q4  
 Included observations: 43 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ECM2(-1) | -0.676402   | 0.148715   | -4.548311   | 0.0000 |
| C        | 0.881031    | 101.8219   | 0.008653    | 0.9931 |

**Source:** Author's computation Eviews Output, 2022

The ECM results show it is stationary at the 5% significance level using Phillips-Perron Test.

Dependent Variable: INDCI  
 Method: Least Squares  
 Date: 01/28/22 Time: 23:58  
 Sample: 2010Q1 2020Q4  
 Included observations: 44

| Variable | Coefficient | Std. Error | t-Statistic |
|----------|-------------|------------|-------------|
| INDP     | -211.9626   | 226.5979   | -0.935413   |
| GDP      | 0.029049    | 0.016429   | 1.768122    |
| INF      | 2330.630    | 2111.561   | 1.103747    |
| FOP      | 447.5239    | 192.7225   | 2.322115    |
| EXR      | 4.011731    | 2.838745   | 1.413206    |
| USDR     | -31.93480   | 40.03699   | -0.797632   |
| GFC      | 2.146191    | 3.570984   | 0.601008    |
| C        | -714.3400   | 442.7302   | -1.613488   |

Null Hypothesis: ECM3 has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -8.513275   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(ECM3)  
 Method: Least Squares  
 Date: 01/13/22 Time: 18:22  
 Sample (adjusted): 2010Q2 2020Q4  
 Included observations: 43 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ECM3(-1) | -1.217316   | 0.142990   | -8.513275   | 0.0000 |
| C        | -6.629377   | 16.57851   | -0.399878   | 0.6913 |

**Source:** Author's computation Eviews Output, 2022

The ECM results show it is stationary at the 5% significance level using augmented Dickey-Fuller Test.

Dependent Variable: SEVCI

Method: Least Squares

Date: 01/13/22 Time: 18:25

Sample: 2010Q1 2020Q4

Included observations: 44

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| SEVP     | -146.3382   | 557.4577   | -0.262510   | 0.7944 |
| GDP      | 0.078074    | 0.027572   | 2.831645    | 0.0075 |
| INF      | -320.8919   | 3803.215   | -0.084374   | 0.9332 |
| FOP      | 856.5756    | 339.4382   | 2.523510    | 0.0162 |
| EXR      | 0.111133    | 4.940234   | 0.022496    | 0.9822 |
| USDR     | -30.94495   | 69.80122   | -0.443330   | 0.6602 |
| GFC      | 6.760133    | 6.400453   | 1.056196    | 0.2979 |
| C        | -1154.923   | 756.0461   | -1.527583   | 0.1354 |

Null Hypothesis: ECM4 has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -7.257859   | 0.0000 |
| Test critical values:                  |             |        |
| 1% level                               | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** *Author's computation Eviews Output, 2022*

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(ECM4)

Method: Least Squares

Date: 01/13/22 Time: 18:25

Sample (adjusted): 2010Q2 2020Q4

Included observations: 43 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ECM4(-1) | -1.128331   | 0.155463   | -7.257859   | 0.0000 |
| C        | 1.476532    | 33.40188   | 0.044205    | 0.9650 |

**Source:** *Author's computation Eviews Output, 2022*

The ECM results show it is stationary at the 5% significance level using augmented Dickey-Fuller Test.

Dependent Variable: SHRCI  
 Method: Least Squares  
 Date: 01/13/22 Time: 18:27  
 Sample: 2010Q1 2020Q4  
 Included observations: 44

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| SHRP     | 0.036542    | 0.117412   | 0.311228    | 0.7574 |
| GDP      | -0.110746   | 0.095181   | -1.163532   | 0.2523 |
| INF      | -10527.27   | 13416.64   | -0.784643   | 0.4378 |
| FOP      | 8958.645    | 1263.714   | 7.089140    | 0.0000 |
| EXR      | 1.976104    | 17.53120   | 0.112719    | 0.9109 |
| USDR     | 6.011294    | 247.0910   | 0.024328    | 0.9807 |
| GFC      | -85.26196   | 22.92186   | -3.719679   | 0.0007 |
| C        | 3417.480    | 2664.835   | 1.282436    | 0.2079 |

Null Hypothesis: ECM5 has a unit root  
 Exogenous: Constant  
 Lag Length: 0 (Automatic - based on SIC, maxlag=9)

|                                        | t-Statistic | Prob.* |
|----------------------------------------|-------------|--------|
| Augmented Dickey-Fuller test statistic | -4.370110   | 0.0011 |
| Test critical values:                  |             |        |
| 1% level                               | -3.592462   |        |
| 5% level                               | -2.931404   |        |
| 10% level                              | -2.603944   |        |

\*MacKinnon (1996) one-sided p-values.

**Source:** Author's computation Eviews Output, 2022

Augmented Dickey-Fuller Test Equation  
 Dependent Variable: D(ECM5)  
 Method: Least Squares  
 Date: 01/13/22 Time: 18:27  
 Sample (adjusted): 2010Q2 2020Q4  
 Included observations: 43 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| ECM5(-1) | -0.637568   | 0.145893   | -4.370110   | 0.0001 |
| C        | 1.541508    | 111.5093   | 0.013824    | 0.9890 |

**Source:** Author's computation Eviews Output, 2022

The ECM results show it is stationary at the 5% significance level using augmented Dickey-Fuller Test.

## ARDL and Bounds Tests

Dependent Variable: AGRCI  
 Method: ARDL  
 Date: 12/18/21 Time: 11:01  
 Sample (adjusted): 2011Q1 2020Q4  
 Included observations: 40 after adjustments  
 Maximum dependent lags: 4 (Automatic selection)  
 Model selection method: Akaike info criterion (AIC)  
 Dynamic regressors (4 lags, automatic): GDP INFR FOP EXR USDR  
 Fixed regressors: AGRP GFC C  
 Number of models evaluated: 12500  
 Selected Model: ARDL(4, 2, 3, 4, 4, 4)  
 White-Hinkley (HC1) heteroskedasticity consistent standard errors and  
 Covariance

| Variable  | Coefficient | Std. Error | t-Statistic | Prob.* |
|-----------|-------------|------------|-------------|--------|
| AGRCI(-1) | -0.098935   | 0.386826   | -0.255760   | 0.8029 |
| AGRCI(-2) | -0.907235   | 0.268887   | -3.374035   | 0.0062 |
| AGRCI(-3) | -2.060500   | 0.507888   | -4.056992   | 0.0019 |
| AGRCI(-4) | -0.613002   | 0.500690   | -1.224316   | 0.2464 |
| GDP       | 0.040333    | 0.013597   | 2.966406    | 0.0128 |
| GDP(-1)   | 0.006018    | 0.006930   | 0.868426    | 0.4037 |
| GDP(-2)   | 0.027315    | 0.015923   | 1.715388    | 0.1143 |
| INFR      | 2471.023    | 1170.149   | 2.111716    | 0.0584 |
| INFR(-1)  | 1880.540    | 1445.557   | 1.300910    | 0.2199 |
| INFR(-2)  | 2224.041    | 1145.969   | 1.940752    | 0.0783 |
| INFR(-3)  | 2411.811    | 1189.306   | 2.027914    | 0.0675 |
| FOP       | 99.51620    | 105.5493   | 0.942841    | 0.3660 |
| FOP(-1)   | 85.53139    | 87.48303   | 0.977691    | 0.3492 |
| FOP(-2)   | -178.5826   | 146.4584   | -1.219340   | 0.2482 |
| FOP(-3)   | 284.3050    | 111.1113   | 2.558742    | 0.0266 |
| FOP(-4)   | 132.5137    | 117.9441   | 1.123530    | 0.2851 |
| EXR       | -4.835524   | 2.363644   | -2.045793   | 0.0654 |
| EXR(-1)   | -1.887476   | 1.901018   | -0.992877   | 0.3421 |
| EXR(-2)   | 1.911392    | 1.754604   | 1.089358    | 0.2993 |
| EXR(-3)   | 5.723753    | 2.477637   | 2.310166    | 0.0413 |
| EXR(-4)   | 3.601321    | 2.417292   | 1.489816    | 0.1644 |
| USDR      | -114.3478   | 63.47042   | -1.801592   | 0.0991 |
| USDR(-1)  | -80.99846   | 62.17575   | -1.302734   | 0.2193 |
| USDR(-2)  | 132.5668    | 48.70260   | 2.721966    | 0.0199 |
| USDR(-3)  | -40.50538   | 82.22716   | -0.492603   | 0.6320 |
| USDR(-4)  | 180.1362    | 63.92402   | 2.817973    | 0.0167 |
| AGRP      | 458.0666    | 532.1671   | 0.860757    | 0.4077 |
| GFC       | -9.383061   | 3.756675   | -2.497704   | 0.0296 |
| C         | -1663.119   | 779.3208   | -2.134062   | 0.0562 |

\*Note: p-values and any subsequent tests do not account for model selection.

**Source:** Author's computation Eviews Output, 2022

The R-squared is 89% and Adjusted-squared is 62% which indicates that the model is best fit. The F-statistics is below 5% which indicates that the model is significant. The Akaike info criterion at 10.07362 was used to select the model. White-Hinkley is used to correct heteroskedasticity. The probability value of the GDP 0.0128% < 5% indicates that the variable is significant. The probability value of INFR is 0.0584% < 5% indicates that the variable is significant. The probability value of FOP is 0.3660% > 5% indicates that the variable is insignificant. The probability value of EXR is 0.0654% > 5% indicates that the variable is insignificant. USDR 0.0991 > 5% indicates that the variable is insignificant. The probability value of ARGP 0.4077% > 5% indicates that the variable is insignificant. The probability value of GFC 0.0296% < 5% indicates that the variable is significant.

For short run effects on the variables the coefficient of GDP suggests that if the GDP is increased by 1% the dependent variable AGRCI increases by 0.04%. The coefficient of INFR suggests that if the INFR is increased by 1% the dependent variable AGRCI increases by 24.71%. The coefficient of FOP suggests that if the FOP is increased by 1% the dependent variable AGRCI increases by 99.5. The coefficient of EXR suggests that if the EXR is increased by 1% the dependent variable AGRCI is reduced by 4.83%. The coefficient of USDR suggests that if the USDR is increased by 1% the dependent variable AGRCI reduces by 11.4%. The coefficient of AGRP suggests that if the AGRP is increased by 1% the dependent variable AGRCI increases by 458%. The coefficient of GFC suggests that if the GFC is increased by 1% the dependent variable AGRCI reduces by 9.3%. This is to be noted that these are for short run effects.

ARDL Long Run Form and Bounds Test  
 Dependent Variable: D(AGRCI)  
 Selected Model: ARDL(4, 2, 3, 4, 4)  
 Case 2: Restricted Constant and No Trend  
 Date: 12/18/21 Time: 11:13  
 Sample: 2010Q1 2020Q4  
 Included observations: 40

Conditional Error Correction Regression

| Variable     | Coefficient | Std. Error | t-Statistic | Prob.  |
|--------------|-------------|------------|-------------|--------|
| C            | -1663.119   | 662.9363   | -2.508716   | 0.0291 |
| AGRCI(-1)*   | -4.679671   | 1.085503   | -4.311064   | 0.0012 |
| GDP(-1)      | 0.073666    | 0.027626   | 2.666603    | 0.0219 |
| INFR(-1)     | 8987.414    | 3129.658   | 2.871692    | 0.0152 |
| FOP(-1)      | 423.2837    | 180.9410   | 2.339346    | 0.0392 |
| EXR(-1)      | 4.513465    | 2.640486   | 1.709331    | 0.1154 |
| USDR(-1)     | 76.85136    | 46.14110   | 1.665573    | 0.1240 |
| D(AGRCI(-1)) | 3.580737    | 0.977862   | 3.661801    | 0.0037 |
| D(AGRCI(-2)) | 2.673502    | 0.782342   | 3.417306    | 0.0058 |
| D(AGRCI(-3)) | 0.613002    | 0.425926   | 1.439222    | 0.1779 |
| D(GDP)       | 0.040333    | 0.011983   | 3.365787    | 0.0063 |
| D(GDP(-1))   | -0.027315   | 0.014992   | -1.821933   | 0.0957 |
| D(INFR)      | 2471.023    | 1038.810   | 2.378706    | 0.0366 |
| D(INFR(-1))  | -4635.852   | 1847.298   | -2.509531   | 0.0290 |
| D(INFR(-2))  | -2411.811   | 1048.736   | -2.299732   | 0.0421 |
| D(FOP)       | 99.51620    | 88.19508   | 1.128365    | 0.2832 |
| D(FOP(-1))   | -238.2361   | 172.6359   | -1.379992   | 0.1950 |
| D(FOP(-2))   | -416.8187   | 136.4181   | -3.055449   | 0.0109 |
| D(FOP(-3))   | -132.5137   | 121.2027   | -1.093324   | 0.2976 |
| D(EXR)       | -4.835524   | 2.402925   | -2.012349   | 0.0693 |
| D(EXR(-1))   | -11.23647   | 3.728443   | -3.013715   | 0.0118 |
| D(EXR(-2))   | -9.325074   | 2.976837   | -3.132544   | 0.0095 |
| D(EXR(-3))   | -3.601321   | 2.443774   | -1.473672   | 0.1686 |
| D(USDR)      | -114.3478   | 66.95384   | -1.707860   | 0.1157 |
| D(USDR(-1))  | -272.1976   | 82.66981   | -3.292588   | 0.0072 |
| D(USDR(-2))  | -139.6308   | 69.80205   | -2.000382   | 0.0708 |
| D(USDR(-3))  | -180.1362   | 68.10042   | -2.645155   | 0.0228 |
| AGRP         | 458.0666    | 395.2360   | 1.158970    | 0.2710 |
| GFC          | -9.383061   | 3.816968   | -2.458250   | 0.0318 |

\* p-value incompatible with t-Bounds distribution.

Levels Equation  
 Case 2: Restricted Constant and No Trend

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| GDP      | 0.015742    | 0.003681   | 4.276984    | 0.0013 |
| INFR     | 1920.522    | 710.5362   | 2.702920    | 0.0205 |
| FOP      | 90.45159    | 45.21383   | 2.000529    | 0.0707 |
| EXR      | 0.964483    | 0.546310   | 1.765450    | 0.1052 |
| USDR     | 16.42238    | 12.05472   | 1.362320    | 0.2003 |
| C        | -355.3922   | 118.1973   | -3.006771   | 0.0119 |

$$EC = AGRCI - (0.0157 * GDP + 1920.5225 * INFR + 90.4516 * FOP + 0.9645 * EXR + 16.4224 * USDR - 355.3922)$$

F-Bounds Test Null Hypothesis: No levels relationship

| Test Statistic         | Value    | Signif. | I(0)  | I(1)  |
|------------------------|----------|---------|-------|-------|
| Asymptotic:<br>n=1000  |          |         |       |       |
| F-statistic            | 3.049437 | 10%     | 2.08  | 3     |
| K                      | 5        | 5%      | 2.39  | 3.38  |
|                        |          | 2.5%    | 2.7   | 3.73  |
|                        |          | 1%      | 3.06  | 4.15  |
| Finite Sample:<br>n=40 |          |         |       |       |
| Actual Sample Size     | 40       | 10%     | 2.306 | 3.353 |
|                        |          | 5%      | 2.734 | 3.92  |
|                        |          | 1%      | 3.657 | 5.256 |

**Source:** *Author's computation Eviews Output, 2022*

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F-statistics is about the upper bound test therefore there is a long run relationship. The probability value of GDP is  $0.0013\% < 5\%$  thus there is long run relationship between GDP and ARGCI.

The probability value of INFR is  $0.0205\% < 5\%$  thus there is long run relationship between INFR and ARGCI.

The probability value of FOP is  $0.07\% > 5\%$  thus there is no long run relationship between FOP and ARGCI.

The probability value of EXR is  $0.052\% > 5\%$  thus there is no long run relationship between EXR and ARGCI.

The probability value of GDP is  $0.2003\% > 5\%$  thus there no is long run relationship between USDR and ARGCI.

The probability value of GDP is significant of which the coefficient of GDP is 0.0157 which indicates that if GDP is increased by 1% then the ARGCI increases by 0.0157%. The probability value of INFR is significant of which the coefficient of INFR is 1920 which indicates that if INFR is increased by 1% then the ARGCI increases by 19.2%.

Dependent Variable: FINCI  
 Method: ARDL  
 Date: 12/18/21 Time: 11:20  
 Sample (adjusted): 2011Q1 2020Q4  
 Included observations: 40 after adjustments  
 Maximum dependent lags: 4 (Automatic selection)  
 Model selection method: Akaike info criterion (AIC)  
 Dynamic regressors (4 lags, automatic): GDP INFR FOP EXR USDR  
 Fixed regressors: FINP GFC C  
 Number of models evaluated: 12500  
 Selected Model: ARDL(1, 4, 0, 3, 1, 2)  
 White-Hinkley (HC1) heteroskedasticity consistent standard errors and  
 Covariance

| Variable  | Coefficient | Std. Error | t-Statistic | Prob.* |
|-----------|-------------|------------|-------------|--------|
| FINCI(-1) | 0.150469    | 0.121792   | 1.235464    | 0.2303 |
| GDP       | 0.247031    | 0.211638   | 1.167229    | 0.2562 |
| GDP(-1)   | 0.352574    | 0.104104   | 3.386754    | 0.0028 |
| GDP(-2)   | -0.193086   | 0.093389   | -2.067554   | 0.0512 |
| GDP(-3)   | 0.209654    | 0.104482   | 2.006600    | 0.0578 |
| GDP(-4)   | -0.462047   | 0.223837   | -2.064211   | 0.0516 |
| INFR      | -8652.980   | 8482.832   | -1.020058   | 0.3193 |
| FOP       | 3819.452    | 763.1347   | 5.004951    | 0.0001 |
| FOP(-1)   | -2037.345   | 1254.274   | -1.624322   | 0.1192 |
| FOP(-2)   | 1051.909    | 728.5746   | 1.443790    | 0.1636 |
| FOP(-3)   | -1708.587   | 691.9524   | -2.469226   | 0.0222 |
| EXR       | 25.16185    | 9.858694   | 2.552249    | 0.0186 |
| EXR(-1)   | -22.59619   | 13.24497   | -1.706021   | 0.1028 |
| USDR      | -723.5187   | 332.8953   | -2.173412   | 0.0413 |
| USDR(-1)  | -692.2802   | 380.9908   | -1.817052   | 0.0835 |
| USDR(-2)  | 1668.816    | 269.1172   | 6.201074    | 0.0000 |
| FINP      | -4340.118   | 2465.128   | -1.760605   | 0.0929 |
| GFC       | 68.36303    | 20.41029   | 3.349439    | 0.0030 |
| C         | -3261.440   | 2772.826   | -1.176215   | 0.2527 |

\*Note: p-values and any subsequent tests do not account for model selection.

Source: Author's computation Eviews Output, 2022

The R-squared is 95% and Adjusted-squared is 92% which indicates that the model is best fit. The F-statistics is below 5% which indicates that the model is significant. The Akaike info criterion at 14.64374 was used to select the model. White-Hinkley is used to correct heteroskedasticity. The probability value of the GDP 0.2562 > 5% indicates that the variable is insignificant. The probability value of INFR is 0.3193 > 5% indicates that the variable is insignificant. The probability value of FOP is 0.0001 < 5% indicates that the variable is significant. The probability value of EXR is 0.0186 > 5% indicates that the variable is significant. USDR 0.0413 < 5% indicates that the variable is significant. The probability value of FINP 0.0929 > 5% indicates that the variable is insignificant. The probability value of GFC 0.0030 < 5% indicates that the variable is significant.

For short run effects on the variables the coefficient of GDP suggests that if the GDP is increased by 1% the dependent variable FINCI increases by 0.247. The coefficient of INFR suggests that if the INFR is increased by 1% the dependent variable FINCI reduces by 86.52%. The coefficient of FOP suggests that if the FOP is increased by 1% the dependent variable FINCI increases by 38.19%. The coefficient of EXR suggests that if the EXR is increased by 1% the dependent variable FINCI is increased by 25%. The coefficient of USDR suggests that if the USDR is increased by 1% the dependent variable FINCI is reduced by 72.3%. The coefficient of FINP suggests that if the FINP is increased by 1% the dependent variable FINCI is reduced by 43.40%. The coefficient of GFC suggests that if the GFC is increased by 1% the dependent variable FINCI increases by 68.4%. This is to be noted that these are for short run effects.

ARDL Long Run Form and Bounds Test

Dependent Variable: D(FINCI)

Selected Model: ARDL(1, 4, 0, 3, 1, 2)

Case 2: Restricted Constant and No Trend

Date: 12/18/21 Time: 11:21

Sample: 2010Q1 2020Q4

Included observations: 40

Conditional Error Correction Regression

| Variable    | Coefficient | Std. Error | t-Statistic | Prob.  |
|-------------|-------------|------------|-------------|--------|
| C           | -3261.440   | 2440.224   | -1.336533   | 0.1957 |
| FINCI(-1)*  | -0.849531   | 0.121429   | -6.996137   | 0.0000 |
| GDP(-1)     | 0.154126    | 0.098091   | 1.571255    | 0.1311 |
| INFR**      | -8652.980   | 8195.199   | -1.055860   | 0.3030 |
| FOP(-1)     | 1125.429    | 1063.888   | 1.057846    | 0.3021 |
| EXR(-1)     | 2.565656    | 11.61112   | 0.220966    | 0.8273 |
| USDR(-1)    | 253.0171    | 175.6062   | 1.440821    | 0.1644 |
| D(GDP)      | 0.247031    | 0.216887   | 1.138980    | 0.2675 |
| D(GDP(-1))  | 0.445479    | 0.195569   | 2.277866    | 0.0333 |
| D(GDP(-2))  | 0.252393    | 0.197012   | 1.281105    | 0.2141 |
| D(GDP(-3))  | 0.462047    | 0.225607   | 2.048015    | 0.0533 |
| D(FOP)      | 3819.452    | 692.5444   | 5.515101    | 0.0000 |
| D(FOP(-1))  | 656.6781    | 842.4739   | 0.779464    | 0.4444 |
| D(FOP(-2))  | 1708.587    | 700.9500   | 2.437530    | 0.0238 |
| D(EXR)      | 25.16185    | 12.19226   | 2.063757    | 0.0516 |
| D(USDR)     | -723.5187   | 368.7461   | -1.962105   | 0.0631 |
| D(USDR(-1)) | -1668.816   | 331.9308   | -5.027601   | 0.0001 |
| FINP        | -4340.118   | 2533.944   | -1.712792   | 0.1015 |
| GFC         | 68.36303    | 17.61139   | 3.881752    | 0.0009 |

\* p-value incompatible with t-Bounds distribution.

\*\* Variable interpreted as  $Z = Z(-1) + D(Z)$ .

Levels Equation  
Case 2: Restricted Constant and No Trend

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| GDP      | 0.181425    | 0.119669   | 1.516047    | 0.1444 |
| INFR     | -10185.60   | 10140.53   | -1.004444   | 0.3266 |
| FOP      | 1324.766    | 1230.236   | 1.076838    | 0.2938 |
| EXR      | 3.020086    | 14.23981   | 0.212087    | 0.8341 |
| USDR     | 297.8316    | 249.2810   | 1.194763    | 0.2455 |
| C        | -3839.107   | 3169.638   | -1.211213   | 0.2393 |

$$EC = FINCI - (0.1814 * GDP - 10185.5983 * INFR + 1324.7657 * FOP + 3.0201 * EXR + 297.8316 * USDR - 3839.1070)$$

F-Bounds Test

Null Hypothesis: No levels relationship

| Test Statistic | Value    | Signif. | I(0) | I(1) |
|----------------|----------|---------|------|------|
| F-statistic    | 10.23015 | 10%     | 2.08 | 3    |
| K              | 5        | 5%      | 2.39 | 3.38 |
|                |          | 2.5%    | 2.7  | 3.73 |
|                |          | 1%      | 3.06 | 4.15 |

Asymptotic:  
n=1000

| Actual Sample Size | 40    | Finite Sample:<br>n=40 |       |       |
|--------------------|-------|------------------------|-------|-------|
|                    |       | 10%                    | 2.306 | 3.353 |
| 5%                 | 2.734 | 3.92                   |       |       |
| 1%                 | 3.657 | 5.256                  |       |       |

**Source:** *Author's computation Eviews Output, 2022*

F-statistics is about the upper bound test therefore there is a long run relationship. The probability value of GDP is 0.144% > 5% thus there is no long run relationship between GDP and FINCI.

The probability value of INFR is 0.3266% > 5% thus there is no long run relationship between INFR and FINCI.

The probability value of FOP is 0.29% > 5% thus there is no long run relationship between FOP and FINCI.

The probability value of EXR is 0.83% > 5% thus there is no long run relationship between EXR and FINCI.

The probability value of GDP is 0.24% > 5% thus there no is long run relationship between USDR and FINCI.

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Dependent Variable: INDCI  
Method: ARDL  
Date: 12/18/21 Time: 11:28  
Sample (adjusted): 2011Q1 2020Q4  
Included observations: 40 after adjustments  
Maximum dependent lags: 4 (Automatic selection)  
Model selection method: Akaike info criterion (AIC)  
Dynamic regressors (4 lags, automatic): GDP INFR FOP EXR USDR  
Fixed regressors: INDP GFC C  
Number of models evaluated: 12500  
Selected Model: ARDL(4, 2, 4, 3, 3, 4)  
White-Hinkley (HC1) heteroskedasticity consistent standard errors and  
Covariance

| Variable  | Coefficient | Std. Error | t-Statistic | Prob.* |
|-----------|-------------|------------|-------------|--------|
| INDCI(-1) | -0.870395   | 0.301917   | -2.882893   | 0.0138 |
| INDCI(-2) | -0.977352   | 0.330979   | -2.952915   | 0.0121 |
| INDCI(-3) | -0.682544   | 0.194304   | -3.512770   | 0.0043 |
| INDCI(-4) | -0.364296   | 0.162583   | -2.240676   | 0.0447 |
| GDP       | -0.009211   | 0.028665   | -0.321331   | 0.7535 |
| GDP(-1)   | 0.125123    | 0.033324   | 3.754776    | 0.0027 |
| GDP(-2)   | 0.032515    | 0.036975   | 0.879391    | 0.3965 |
| INFR      | 1589.220    | 4649.331   | 0.341817    | 0.7384 |
| INFR(-1)  | 6764.248    | 2029.105   | 3.333612    | 0.0060 |
| INFR(-2)  | 3481.985    | 1729.739   | 2.013012    | 0.0671 |
| INFR(-3)  | -871.7066   | 2689.827   | -0.324075   | 0.7515 |
| INFR(-4)  | 10095.17    | 3214.969   | 3.140051    | 0.0085 |
| FOP       | 603.5998    | 175.7475   | 3.434471    | 0.0049 |
| FOP(-1)   | 775.2591    | 275.0268   | 2.818849    | 0.0155 |
| FOP(-2)   | 30.07102    | 368.6128   | 0.081579    | 0.9363 |
| FOP(-3)   | 671.2424    | 318.0057   | 2.110787    | 0.0565 |
| EXR       | 8.827887    | 6.572498   | 1.343156    | 0.2041 |
| EXR(-1)   | 4.872322    | 5.225060   | 0.932491    | 0.3695 |
| EXR(-2)   | 5.803720    | 5.942116   | 0.976709    | 0.3480 |
| EXR(-3)   | -10.64410   | 3.940644   | -2.701107   | 0.0193 |
| USDR      | 38.53046    | 117.1650   | 0.328857    | 0.7479 |
| USDR(-1)  | -80.68216   | 134.9964   | -0.597662   | 0.5612 |
| USDR(-2)  | -8.256344   | 94.79894   | -0.087093   | 0.9320 |
| USDR(-3)  | -361.7291   | 127.3861   | -2.839626   | 0.0149 |
| USDR(-4)  | 339.5556    | 125.3151   | 2.709615    | 0.0190 |
| INDP      | -10025.51   | 2164.145   | -4.632549   | 0.0006 |
| GFC       | -2.049900   | 6.208744   | -0.330163   | 0.7470 |
| C         | -2974.679   | 1339.563   | -2.220635   | 0.0464 |

\*Note: p-values and any subsequent tests do not account for modelselection.

Source: Author's computation Eviews Output, 2022

The R-squared is 86% and Adjusted-squared is 54% which indicates that the model is best fit. The F-statistics is below 5% which indicates that the model is significant. The Akaike info criterion at 11.99565 was used to select the model. White-Hinkley is used to correct heteroskedasticity. The probability value of the GDP 0.75% > 5% indicates that the variable is insignificant. The probability value of INFR is 0.7384% > 5% indicates that the variable is insignificant. The probability value of FOP is 0.0049% < 5% indicates that the variable is significant. The probability value of EXR is 0.2041% > 5% indicates that the variable is insignificant. USDR 0.7479 > 5% indicates that the variable is insignificant. The probability value of INDP 0.0006% < 5% indicates that the variable is significant. The probability value of GFC 0.747% > 5% indicates that the variable is insignificant.

For short run effects on the variables the coefficient of GDP suggests that if the GDP is increased by 1% the dependent variable INDCI increases by 0.0092%. The coefficient of INFR suggests that if the INFR is increased by 1% the dependent variable INDCI reduces by 15.9%. The coefficient of FOP suggests that if the FOP is increased by 1% the dependent variable FINCI increases by 60.3%. The coefficient of EXR suggests that if the EXR is increased by 1% the dependent variable INDCI increased by 8.8%. The coefficient of USDR suggests that if the USDR is increased by 1% the dependent variable INDCI increases by 38.5%. The coefficient of INDP suggests that if the INDP is increased by 1% the dependent variable INDCI reduces by 10.25%. The coefficient of GFC suggests that if the GFC is increased by 1% the dependent variable FINCI reduces by 2%. This is to be noted that these are for short run effects.

ARDL Long Run Form and Bounds Test  
 Dependent Variable: D(INDCI)  
 Selected Model: ARDL(4, 2, 4, 3, 3, 4)  
 Case 2: Restricted Constant and No Trend  
 Date: 12/18/21 Time: 11:30  
 Sample: 2010Q1 2020Q4  
 Included observations: 40

| Conditional Error Correction Regression |             |            |             |        |
|-----------------------------------------|-------------|------------|-------------|--------|
| Variable                                | Coefficient | Std. Error | t-Statistic | Prob.  |
| C                                       | -2974.679   | 1518.811   | -1.958558   | 0.0738 |
| INDCI(-1)*                              | -3.894588   | 0.984271   | -3.956824   | 0.0019 |
| GDP(-1)                                 | 0.148427    | 0.060396   | 2.457568    | 0.0302 |
| INFR(-1)                                | 21058.91    | 6854.619   | 3.072222    | 0.0097 |
| FOP(-1)                                 | 2080.172    | 695.4993   | 2.990905    | 0.0113 |
| EXR(-1)                                 | 8.859829    | 8.016241   | 1.105235    | 0.2907 |
| USDR(-1)                                | -72.58156   | 102.6047   | -0.707390   | 0.4928 |
| D(INDCI(-1))                            | 2.024192    | 0.771845   | 2.622539    | 0.0223 |
| D(INDCI(-2))                            | 1.046840    | 0.418843   | 2.499361    | 0.0279 |
| D(INDCI(-3))                            | 0.364296    | 0.184580   | 1.973649    | 0.0719 |
| D(GDP)                                  | -0.009211   | 0.034540   | -0.266672   | 0.7942 |
| D(GDP(-1))                              | -0.032515   | 0.038284   | -0.849325   | 0.4123 |
| D(INFR)                                 | 1589.220    | 3216.594   | 0.494069    | 0.6302 |
| D(INFR(-1))                             | -12705.44   | 4839.283   | -2.625481   | 0.0222 |
| D(INFR(-2))                             | -9223.460   | 4201.705   | -2.195171   | 0.0486 |
| D(INFR(-3))                             | -10095.17   | 3885.500   | -2.598164   | 0.0233 |
| D(FOP)                                  | 603.5998    | 227.1966   | 2.656730    | 0.0209 |
| D(FOP(-1))                              | -701.3134   | 525.5324   | -1.334482   | 0.2068 |
| D(FOP(-2))                              | -671.2424   | 418.9767   | -1.602099   | 0.1351 |
| D(EXR)                                  | 8.827887    | 6.645393   | 1.328422    | 0.2087 |
| D(EXR(-1))                              | 4.840380    | 4.674656   | 1.035451    | 0.3209 |
| D(EXR(-2))                              | 10.64410    | 4.417790   | 2.409372    | 0.0330 |
| D(USDR)                                 | 38.53046    | 146.7533   | 0.262553    | 0.7973 |
| D(USDR(-1))                             | 30.42985    | 95.76303   | 0.317762    | 0.7561 |
| D(USDR(-2))                             | 22.17351    | 123.6150   | 0.179376    | 0.8606 |
| D(USDR(-3))                             | -339.5556   | 184.5390   | -1.840021   | 0.0906 |
| INDP                                    | -10025.51   | 3575.089   | -2.804267   | 0.0159 |
| GFC                                     | -2.049900   | 6.943514   | -0.295225   | 0.7729 |

\* p-value incompatible with t-Bounds distribution.

| Levels Equation                          |             |            |             |        |
|------------------------------------------|-------------|------------|-------------|--------|
| Case 2: Restricted Constant and No Trend |             |            |             |        |
| Variable                                 | Coefficient | Std. Error | t-Statistic | Prob.  |
| GDP                                      | 0.038111    | 0.008944   | 4.261213    | 0.0011 |
| INFR                                     | 5407.225    | 1362.460   | 3.968722    | 0.0019 |
| FOP                                      | 534.1187    | 90.31117   | 5.914205    | 0.0001 |
| EXR                                      | 2.274908    | 1.721447   | 1.321509    | 0.2110 |
| USDR                                     | -18.63652   | 20.57181   | -0.905925   | 0.3828 |
| C                                        | -763.7982   | 245.2864   | -3.113903   | 0.0090 |

$$EC = INDCI - (0.0381 * GDP + 5407.2249 * INFR + 534.1187 * FOP + 2.2749 * EXR - 18.6365 * USDR - 763.7982)$$

| F-Bounds Test  |          | Null Hypothesis: No levels relationship |      |      |
|----------------|----------|-----------------------------------------|------|------|
| Test Statistic | Value    | Signif.                                 | I(0) | I(1) |
| F-statistic    | 4.006964 | 10%                                     | 2.08 | 3    |

Asymptotic:  
n=1000

|                    |    |                        |       |       |
|--------------------|----|------------------------|-------|-------|
| K                  | 5  | 5%                     | 2.39  | 3.38  |
|                    |    | 2.5%                   | 2.7   | 3.73  |
|                    |    | 1%                     | 3.06  | 4.15  |
| Actual Sample Size | 40 | Finite Sample:<br>n=40 |       |       |
|                    |    | 10%                    | 2.306 | 3.353 |
|                    |    | 5%                     | 2.734 | 3.92  |
|                    |    | 1%                     | 3.657 | 5.256 |

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**Source:** *Author's computation Eviews Output, 2022*

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F-statistics is about the upper bound test therefore there is a long run relationship. The probability value of GDP is  $0.0011\% < 5\%$  thus there is long run relationship between GDP and INDCI.

The probability value of INFR is  $0.0019\% > 5\%$  thus there is long run relationship between INFR and INDCI.

The probability value of FOP is  $0.0001\% < 5\%$  thus there is long run relationship between FOP and INDCI.

The probability value of EXR is  $0.211\% > 5\%$  thus there is no long run relationship between EXR and INDCI.

The probability value of USDR is  $0.3828\% > 5\%$  thus there no is long run relationship between USDR and INDCI.

The probability value of GDP is significant of which the coefficient of GDP is  $0.038\%$  which indicates that if GDP is increased by 1% then the INDCI increases by  $0.0157\%$ . The probability value of GDP is significant of which the coefficient of INFR is  $5407\%$  which indicates that if INFR is increased by 1% then the ARGCI increases by  $5407\%$ . The probability value of FOP is significant of which the coefficient of FOP is  $5407$  which indicates that if FOP is increased by 1% then the INDCI increases by  $53\%$ .

Dependent Variable: SEVCI  
Method: ARDL  
Date: 12/18/21 Time: 11:36  
Sample (adjusted): 2011Q1 2020Q4  
Included observations: 40 after adjustments  
Maximum dependent lags: 4 (Automatic selection)  
Model selection method: Akaike info criterion (AIC)  
Dynamic regressors (4 lags, automatic): GDP INFR FOP EXR USDR  
Fixed regressors: SEVP GFC C  
Number of models evaluated: 12500  
Selected Model: ARDL(4, 4, 4, 3, 3, 4)  
White-Hinkley (HC1) heteroskedasticity consistent standard errors and  
Covariance

| Variable  | Coefficient | Std. Error | t-Statistic | Prob.* |
|-----------|-------------|------------|-------------|--------|
| SEVCI(-1) | -0.586272   | 0.226955   | -2.583206   | 0.0273 |
| SEVCI(-2) | -0.505960   | 0.172193   | -2.938336   | 0.0148 |
| SEVCI(-3) | 0.164254    | 0.197471   | 0.831791    | 0.4249 |
| SEVCI(-4) | -0.242837   | 0.142144   | -1.708380   | 0.1184 |
| GDP       | 0.058202    | 0.135452   | 0.429686    | 0.6765 |
| GDP(-1)   | 0.048716    | 0.036983   | 1.317259    | 0.2171 |
| GDP(-2)   | 0.294482    | 0.086667   | 3.397878    | 0.0068 |
| GDP(-3)   | -0.065116   | 0.044770   | -1.454449   | 0.1765 |
| GDP(-4)   | -0.150785   | 0.136709   | -1.102964   | 0.2959 |
| INFR      | -7458.238   | 4289.297   | -1.738802   | 0.1127 |
| INFR(-1)  | 4700.075    | 4113.987   | 1.142462    | 0.2799 |
| INFR(-2)  | 1718.363    | 3480.528   | 0.493708    | 0.6322 |
| INFR(-3)  | -6601.516   | 4928.674   | -1.339410   | 0.2101 |
| INFR(-4)  | 8122.464    | 2418.706   | 3.358186    | 0.0073 |
| FOP       | -56.37060   | 317.8712   | -0.177338   | 0.8628 |
| FOP(-1)   | 500.5928    | 359.2579   | 1.393408    | 0.1937 |
| FOP(-2)   | 2142.319    | 681.5693   | 3.143216    | 0.0105 |
| FOP(-3)   | -833.2227   | 533.0744   | -1.563051   | 0.1491 |
| EXR       | 16.05013    | 8.243381   | 1.947033    | 0.0801 |
| EXR(-1)   | 8.552535    | 6.099610   | 1.402145    | 0.1911 |
| EXR(-2)   | -6.591528   | 5.764022   | -1.143564   | 0.2794 |
| EXR(-3)   | -15.15198   | 6.971556   | -2.173400   | 0.0549 |
| USDR      | 191.9756    | 203.1631   | 0.944933    | 0.3670 |
| USDR(-1)  | -569.1690   | 212.7550   | -2.675232   | 0.0233 |
| USDR(-2)  | 249.7327    | 223.8322   | 1.115714    | 0.2906 |
| USDR(-3)  | -245.9147   | 199.7910   | -1.230860   | 0.2465 |
| USDR(-4)  | 323.7194    | 177.9020   | 1.819650    | 0.0988 |
| SEVP      | 62019.55    | 28517.93   | 2.174756    | 0.0547 |
| GFC       | 15.12279    | 10.38173   | 1.456674    | 0.1759 |
| C         | -3316.530   | 1646.268   | -2.014575   | 0.0716 |

\*Note: p-values and any subsequent tests do not account for model

selection.

**Source:** Author's computation Eviews Output, 2022

The R-squared is 95% and Adjusted-squared is 83% which indicates that the model is best fit. The F-statistics is below 5% which indicates that the model is significant. The Akaike info criterion at 12.35524 was used to select the model. White-Hinkley is used to correct heteroskedasticity. The probability value of the GDP 0.6765% > 5% indicates that the variable is insignificant. The probability value of INFR is 0.1127% > 5% indicates that the variable is insignificant. The probability value of FOP is 0.8628% > 5% indicates that the variable is insignificant. The probability value of EXR is 0.080% > 5% indicates that the variable is insignificant. USDR 0.367% > 5% indicates that the variable is insignificant. The probability value of SEVP 0.0547% < 5% indicates that the variable is significant. The probability value of GFC 0.1759% > 5% indicates that the variable is insignificant.

For short run effects on the variables the coefficient of GDP suggests that if the GDP is increased by 1% the dependent variable SEVCI increases by 0.058%. The coefficient of INFR suggests that if the INFR is increased by 1% the dependent variable SEVCI reduces by 74.%. The coefficient of FOP suggests that if the FOP is increased by 1% the dependent variable SEVCI reduces by 56%. The coefficient of EXR suggests that if the EXR is increased by 1% the dependent variable SEVCI increases by 16%. The coefficient of USDR suggests that if the USDR is increased by 1% the dependent variable SEVCI increases by 19.1%. The coefficient of SEVP suggests that if the SEVP is increased by 1% the dependent variable SEVCI increase s by 62%. The coefficient of GFC suggests that if the GFC is increased by 1% the dependent variable SEVCI increases by 15%. This is to be noted that these are for short run effects.

ARDL Long Run Form and Bounds Test

Dependent Variable: D(SEVCI)

Selected Model: ARDL(4, 4, 4, 3, 3, 4)

Case 2: Restricted Constant and No Trend

Date: 12/18/21 Time: 11:39

Sample: 2010Q1 2020Q4

Included observations: 40

Conditional Error Correction Regression

| Variable     | Coefficient | Std. Error | t-Statistic | Prob.  |
|--------------|-------------|------------|-------------|--------|
| C            | -3316.530   | 1633.911   | -2.029811   | 0.0698 |
| SEVCI(-1)*   | -2.170815   | 0.483670   | -4.488210   | 0.0012 |
| GDP(-1)      | 0.185499    | 0.080928   | 2.292143    | 0.0448 |
| INFR(-1)     | 481.1484    | 12528.90   | 0.038403    | 0.9701 |
| FOP(-1)      | 1753.319    | 540.7827   | 3.242187    | 0.0088 |
| EXR(-1)      | 2.859163    | 9.038017   | 0.316348    | 0.7582 |
| USDR(-1)     | -49.65605   | 128.8835   | -0.385279   | 0.7081 |
| D(SEVCI(-1)) | 0.584543    | 0.359178   | 1.627446    | 0.1347 |
| D(SEVCI(-2)) | 0.078583    | 0.245051   | 0.320679    | 0.7551 |
| D(SEVCI(-3)) | 0.242837    | 0.144937   | 1.675459    | 0.1248 |
| D(GDP)       | 0.058202    | 0.125949   | 0.462107    | 0.6539 |
| D(GDP(-1))   | -0.078581   | 0.143447   | -0.547806   | 0.5958 |
| D(GDP(-2))   | 0.215901    | 0.125218   | 1.724206    | 0.1154 |
| D(GDP(-3))   | 0.150785    | 0.130153   | 1.158523    | 0.2736 |
| D(INFR)      | -7458.238   | 3814.911   | -1.955023   | 0.0791 |
| D(INFR(-1))  | -3239.312   | 7968.738   | -0.406502   | 0.6929 |
| D(INFR(-2))  | -1520.949   | 6105.974   | -0.249092   | 0.8083 |
| D(INFR(-3))  | -8122.464   | 3152.095   | -2.576846   | 0.0276 |
| D(FOP)       | -56.37060   | 286.9479   | -0.196449   | 0.8482 |
| D(FOP(-1))   | -1309.097   | 478.5774   | -2.735392   | 0.0210 |
| D(FOP(-2))   | 833.2227    | 475.5857   | 1.751993    | 0.1103 |
| D(EXR)       | 16.05013    | 7.781750   | 2.062535    | 0.0661 |
| D(EXR(-1))   | 21.74350    | 6.700143   | 3.245230    | 0.0088 |
| D(EXR(-2))   | 15.15198    | 7.118925   | 2.128408    | 0.0592 |
| D(USDR)      | 191.9756    | 230.7441   | 0.831985    | 0.4248 |
| D(USDR(-1))  | -327.5373   | 135.1344   | -2.423789   | 0.0358 |
| D(USDR(-2))  | -77.80461   | 163.4631   | -0.475977   | 0.6443 |
| D(USDR(-3))  | -323.7194   | 226.0349   | -1.432165   | 0.1826 |
| SEVP         | 62019.55    | 23967.18   | 2.587687    | 0.0271 |
| GFC          | 15.12279    | 9.472347   | 1.596519    | 0.1415 |

\* p-value incompatible with t-Bounds distribution.

Levels Equation  
Case 2: Restricted Constant and No Trend

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| GDP      | 0.085451    | 0.023481   | 3.639129    | 0.0045 |
| INFR     | 221.6442    | 5742.328   | 0.038598    | 0.9700 |
| FOP      | 807.6779    | 226.2391   | 3.570019    | 0.0051 |
| EXR      | 1.317092    | 3.753521   | 0.350895    | 0.7329 |
| USDR     | -22.87439   | 54.51976   | -0.419561   | 0.6837 |
| C        | -1527.781   | 522.1483   | -2.925953   | 0.0151 |

$$EC = SEVCI - (0.0855 * GDP + 221.6442 * INFR + 807.6779 * FOP + 1.3171 * EXR - 22.8744 * USDR - 1527.7814)$$

| F-Bounds Test      |          | Null Hypothesis: No levels relationship |       |       |
|--------------------|----------|-----------------------------------------|-------|-------|
| Test Statistic     | Value    | Signif.                                 | I(0)  | I(1)  |
|                    |          | Asymptotic:<br>n=1000                   |       |       |
| F-statistic        | 8.418593 | 10%                                     | 2.08  | 3     |
| K                  | 5        | 5%                                      | 2.39  | 3.38  |
|                    |          | 2.5%                                    | 2.7   | 3.73  |
|                    |          | 1%                                      | 3.06  | 4.15  |
|                    |          | Finite Sample:<br>n=40                  |       |       |
| Actual Sample Size | 40       | 10%                                     | 2.306 | 3.353 |
|                    |          | 5%                                      | 2.734 | 3.92  |
|                    |          | 1%                                      | 3.657 | 5.256 |

**Source:** Author's computation Eviews Output, 2022

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F-statistics is about the upper bound test therefore there is a long run relationship. The probability value of GDP is  $0.0045\% < 5\%$  thus there is long run relationship between GDP and SEVCI.

The probability value of INFR is  $0.97\% > 5\%$  thus there is no long run relationship between INFR and SEVCI.

The probability value of FOP is  $0.0051\% < 5\%$  thus there is long run relationship between FOP and SEVCI.

The probability value of EXR is  $0.7329\% > 5\%$  thus there is no long run relationship between EXR and SEVCI.

The probability value of USDR is  $0.6837\% > 5\%$  thus there no is long run relationship between USDR and SEVCI.

The probability value of GDP is significant of which the coefficient of GDP is  $0.085\%$  which indicates that if GDP is increased by 1% then the SEVCI increases by  $0.085\%$ . The probability value of FOP is significant of which the coefficient of FOP is 807 which indicates that if FOP is increased by 1% then the SEVCI increases by 81%.

Dependent Variable: SHRCI  
 Method: ARDL  
 Date: 12/18/21 Time: 11:43  
 Sample (adjusted): 2010Q4 2020Q4  
 Included observations: 41 after adjustments  
 Maximum dependent lags: 4 (Automatic selection)  
 Model selection method: Akaike info criterion (AIC)  
 Dynamic regressors (4 lags, automatic): GDP INFR FOP EXR USDR  
 Fixed regressors: SHRP GFC C  
 Number of models evaluated: 12500  
 Selected Model: ARDL(1, 1, 0, 3, 2, 2)  
 Note: final equation sample is larger than selection sample  
 White-Hinkley (HC1) heteroskedasticity consistent standard errors and  
 Covariance

| Variable  | Coefficient | Std. Error | t-Statistic | Prob.* |
|-----------|-------------|------------|-------------|--------|
| SHRCI(-1) | 0.143543    | 0.106578   | 1.346832    | 0.1906 |
| GDP       | 0.111590    | 0.071835   | 1.553424    | 0.1334 |
| GDP(-1)   | -0.229484   | 0.061816   | -3.712382   | 0.0011 |
| INFR      | 7338.138    | 8550.886   | 0.858173    | 0.3993 |
| FOP       | 10278.93    | 1069.213   | 9.613547    | 0.0000 |
| FOP(-1)   | -372.5934   | 867.9976   | -0.429256   | 0.6716 |
| FOP(-2)   | -1317.293   | 705.3257   | -1.867638   | 0.0741 |
| FOP(-3)   | 2719.189    | 848.6612   | 3.204092    | 0.0038 |
| EXR       | -16.69684   | 13.94140   | -1.197644   | 0.2428 |
| EXR(-1)   | 8.343317    | 16.54409   | 0.504308    | 0.6186 |
| EXR(-2)   | 17.17960    | 13.94926   | 1.231578    | 0.2300 |
| USDR      | 556.7038    | 468.4492   | 1.188397    | 0.2463 |
| USDR(-1)  | 1396.439    | 552.3143   | 2.528341    | 0.0184 |
| USDR(-2)  | -2288.667   | 208.3913   | -10.98255   | 0.0000 |
| SHRP      | -0.067512   | 0.045424   | -1.486266   | 0.1502 |
| GFC       | -36.33427   | 24.70996   | -1.470430   | 0.1544 |
| C         | 1006.756    | 2230.525   | 0.451354    | 0.6558 |

\*Note: p-values and any subsequent tests do not account for model selection.

Source: Author's computation Eviews Output, 2022

The R-squared is 96% and Adjusted-squared is 93% which indicates that the model is best fit. The F-statistics is below 5% which indicates that the model is significant. The Akaike info criterion at 15.10883 was used to select the model. White-Hinkley is used to correct heteroskedasticity. The probability value of the GDP 0.1334% > 5% indicates that the variable is insignificant. The probability value of INFR is 0.3993% > 5% indicates that the variable is insignificant. The probability value of FOP is 0.000 < 5% indicates that the variable is significant. The probability value of EXR is 0.2428% > 5% indicates that the variable is insignificant. USDR 0.2463% > 5% indicates that the variable is insignificant. The probability value of SHRP 0.1502% > 5% indicates that the variable is insignificant. The probability value of GFC 0.1544% > 5% indicates that the variable is insignificant.

For short run effects on the variables the coefficient of GDP suggests that if the GDP is increased by 1% the dependent variable SHRCI increases by 0.111590%. The coefficient of INFR suggests that if the INFR is increased by 1% the dependent variable SHRCI increases by 73%. The coefficient of FOP suggests that if the FOP is increased by 1% the dependent variable SHRCI increases by 102%. The coefficient of EXR suggests that if the EXR is reduced by 16% the dependent variable SHRCI is increased by 16%. The coefficient of USDR suggests that if the USDR is increased by 1% the dependent variable SHRCI increases by 55%. The coefficient of SHRP suggests that if the SHRP is increased by 1% the dependent variable SHRCI reduces by 0.067%. The coefficient of GFC suggests that if the GFC is increased by 1% the dependent variable SHRCI reduces by 36%. This is to be noted that these are for short run effects.

ARDL Long Run Form and Bounds Test  
 Dependent Variable: D(SHRCI)  
 Selected Model: ARDL(1, 1, 0, 3, 2, 2)  
 Case 2: Restricted Constant and No Trend  
 Date: 12/18/21 Time: 11:44  
 Sample: 2010Q1 2020Q4  
 Included observations: 41

Conditional Error Correction Regression

| Variable    | Coefficient | Std. Error | t-Statistic | Prob.  |
|-------------|-------------|------------|-------------|--------|
| C           | 1006.756    | 1962.475   | 0.513003    | 0.6126 |
| SHRCI(-1)*  | -0.856457   | 0.118106   | -7.251606   | 0.0000 |
| GDP(-1)     | -0.117894   | 0.072759   | -1.620346   | 0.1182 |
| INFR**      | 7338.138    | 8265.018   | 0.887855    | 0.3834 |
| FOP(-1)     | 11308.23    | 1654.440   | 6.835084    | 0.0000 |
| EXR(-1)     | 8.826081    | 11.77056   | 0.749844    | 0.4606 |
| USDR(-1)    | -335.5246   | 168.1331   | -1.995589   | 0.0574 |
| D(GDP)      | 0.111590    | 0.063340   | 1.761741    | 0.0908 |
| D(FOP)      | 10278.93    | 841.1954   | 12.21944    | 0.0000 |
| D(FOP(-1))  | -1401.896   | 933.8672   | -1.501172   | 0.1464 |
| D(FOP(-2))  | -2719.189   | 879.9476   | -3.090171   | 0.0050 |
| D(EXR)      | -16.69684   | 14.97303   | -1.115128   | 0.2758 |
| D(EXR(-1))  | -17.17960   | 14.80535   | -1.160364   | 0.2573 |
| D(USDR)     | 556.7038    | 389.0555   | 1.430911    | 0.1653 |
| D(USDR(-1)) | 2288.667    | 345.6608   | 6.621135    | 0.0000 |
| SHRP        | -0.067512   | 0.061384   | -1.099833   | 0.2823 |
| GFC         | -36.33427   | 16.38850   | -2.217059   | 0.0363 |

\* p-value incompatible with t-Bounds distribution.

\*\* Variable interpreted as  $Z = Z(-1) + D(Z)$ .

Levels Equation  
 Case 2: Restricted Constant and No Trend

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| GDP      | -0.137653   | 0.093751   | -1.468290   | 0.1550 |
| INFR     | 8568.013    | 10105.92   | 0.847821    | 0.4049 |
| FOP      | 13203.50    | 1030.689   | 12.81036    | 0.0000 |
| EXR      | 10.30534    | 15.21403   | 0.677358    | 0.5047 |
| USDR     | -391.7586   | 232.6748   | -1.683718   | 0.1052 |
| C        | 1175.489    | 2556.210   | 0.459856    | 0.6498 |

$$EC = SHRCI - (-0.1377 * GDP + 8568.0134 * INFR + 13203.4996 * FOP + 10.3053 * EXR - 391.7586 * USDR + 1175.4886)$$

F-Bounds Test Null Hypothesis: No levels relationship

| Test Statistic         | Value    | Signif. | I(0) | I(1) |
|------------------------|----------|---------|------|------|
| Asymptotic:<br>n=1000  |          |         |      |      |
| F-statistic            | 11.36775 | 10%     | 2.08 | 3    |
| K                      | 5        | 5%      | 2.39 | 3.38 |
|                        |          | 2.5%    | 2.7  | 3.73 |
|                        |          | 1%      | 3.06 | 4.15 |
| Finite Sample:<br>n=45 |          |         |      |      |
| Actual Sample Size     | 41       |         |      |      |

|                        |       |       |
|------------------------|-------|-------|
| 10%                    | 2.276 | 3.297 |
| 5%                     | 2.694 | 3.829 |
| 1%                     | 3.674 | 5.019 |
| Finite Sample:<br>n=40 |       |       |
| 10%                    | 2.306 | 3.353 |
| 5%                     | 2.734 | 3.92  |
| 1%                     | 3.657 | 5.256 |

**Source:** *Author's computation Eviews Output, 2022*

F-statistics is about the upper bound test therefore there is a long run relationship. The probability value of GDP is  $0.155\% < 5\%$  thus there is no long run relationship between GDP and SHRCI.

The probability value of INFR is  $0.4049\% > 5\%$  thus there is no long run relationship between INFR and SHRCI. The probability value of FOP is  $0.000\% < 5\%$  thus there is long run relationship between FOP and SHRCI. The probability value of EXR is  $0.5047\% > 5\%$  thus there is no long run relationship between EXR and SHRCI. The probability value of USDR is  $0.1052\% > 5\%$  thus there is no long run relationship between USDR and SHRCI.

The probability value of FOP is significant of which the coefficient of FOP is 13203% which indicates that if FOP is increased by 1% then the SHRCI increases by 13%.

**A. Personal Data**

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**Date & Signature:**

### **University Compliance Certification**

This is to certify that the thesis is by Okunola, Bamanosi Praise in the Department of Economics and Development Studies, Faculty of Management and Social Sciences, Lead City University, Ibadan is in full compliance with the approved University Format and Style.

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

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