Econometric Modelling and Forecasting Foreign Direct Investment Inflows in Nigeria: ARIMA Model Approach

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Abstract

This study examined econometric modelling and forecasting foreign direct investment inflows in Nigeria over the next decade using Box-Jenkins ARIMA model approach. The scope of the study is from 1970 to 2020. The correlogram show that the net foreign direct investment inflow in Nigeria is integrated of the first order. Based on the number of significant coefficients, highest adjusted R-squared, lowest volatility and the lowest SBIC and the AIC, the study estimated and presents the ARIMA (1, 1, 3) model. The diagnostic test also shows that the estimated model is not only consistent but good for forecasting the net foreign direct investment inflows in Nigeria and it also explains the dynamics around it. The result of the study shows that net foreign direct investment inflows in Nigeria are likely for exhibit very slow upward trend between 2.80 billion USD and 3.26 billion USD in the next decade which is not significantly different from values of FDI inflows in Nigeria in the recent years.

The study also provide policy recommendations so as to assist policy makers and the Nigerian government on better ways to accelerate and maintain higher level of net foreign direct investment inflows in Nigeria.

Key Words: ARIMA, Foreign Direct Investment Inflows, Forecasting, Box-Jenkins, Nigeria.

INTRODUTION

As different economies in the world becoming interdependent the more and also becoming more interrelated, different countries and regions in the world are seeking out for ways to tap into available and possible opportunities that are in other countries by making use of different means, ways and strategies, one of these strategies or means is the foreign direct investment. The concept or idea behind foreign direct investment deals with the business activities of multinational companies or multinational enterprises beyond their domestic country with the aim

of taking over the market and also maintain competitiveness in the industry at which the enterprise or company exists.

According to Caves (2007), multinational organizations or companies are companies that take charge and manage an establishment that is into production activities which is located in more than one country and Adamu (2018) express that the meaning of control in this case is dissimilar among countries. According to IMF (2009), to consider a foreign investment as foreign direct investment, there must be more than 9% ownership of equity engrossed by the foreign investor in the foreign subsidiary. It can't be disputed that both developing and developed countries benefits and gains from the flows resulting from multinational companies or enterprises (Narula and Marin, 2003)

Foreign direct investment is pertinent for development as it stimulates the development of any economy because it involves the transfer of financial resources, innovation and new technology which helps to create more employment opportunities and in turn boost aggregate demand or gross domestic product. According to Olayiwola and Okodua (2013) foreign direct investment can stimulate economic growth and development in an economy by enlarging the opportunity for uniting into the world capital and financial market, export increase, employment increase and generation of technological efficiency and capacity flows to local firms and it also brings about arrangement of investment that contributes positively to the economic growth of the host countries.

According to Ghebrihiwet and Motchenkova (2017), almost all developing countries rely on foreign direct investment to be able to extract and export natural resources due to low level standard in technological resources and lack of financial resources. Due to the discovery by developing countries that foreign direct investment stimulates growth and development and also helps in generation of employment and income. This therefore has made most of the developing countries to liberalize their investment regimes and also push for some other forms of strategies that attracts foreign investors or foreign direct investment.

The foreign direct investment inflows in recent time in the case of Nigeria has been fluctuating overtime and it is required that for there to be a significant effect of foreign direct investment in an economy by positively affecting some key macroeconomic fundamentals, foreign direct

investment is expected to be sustained overtime or possibly exhibit an increasing trend as well. The net foreign direct investment by the United Kingdom in 2008 was close to half of the value that was reported or recorded in 2007. In 2008 the foreign direct investment that was recorded was £85.80 billion and it was £73.3 billion lower than the foreign direct investment of £159.10 billion that was reported in 2007. According to UNCTAD (2009), Nigeria which is the largest economy in Africa shows to have its share of foreign direct investment inflow to Africa averaged around 9.9%, it drops 24.19% in 1990 to 5.87% in 2001 and up to 11.66% in 2002. There was also a fall the net foreign direct investment inflow between 2013 and 2014 it was recorded to be 55.63 billion US dollars and 46.52 billion US dollars in 2013 and 2015 respectively, and also falls again in 2015. The fall in the foreign direct investment continued up to 2016, 2017 and 2018. According to UNCTAD (2020) foreign direct investment inflows to Nigeria is totaled to be USD 3.3billion in 2019 which shows a 49% decrease as compared to 2018 which was USD 6.4 billion dollars. Nigeria which is regarded as the largest economy in Africa attracted a total foreign direct investment of USD 2.6 billion in 2020 which is lower again as compared to 2019. This is a clear indication that the major investing countries in Nigeria which include USA, China, United Kingdom, Netherlands and France have stopped or reduced their investment level in some or lot of the sectors in Nigeria despite the efforts of the Nigerian government in pushing for foreign direct investment promotions which has been shown by past policy documents such as the 1995 Decree No 16 and Decree No 17 and the existing current One-Stop Investment Centre. These efforts are basically aimed at fostering procedures for foreign direct investment inflows into Nigeria but the foreign direct investment have been falling drastically in the recent time.

This study therefore aims at modelling and forecasting the foreign direct investment inflows from foreign investors to Nigeria over the next decade to discover if it is sustainable or not. This study will also assist the policy makers and academic studies to understand what happens to the foreign direct investment inflows in the future and the future trend of foreign direct investment inflows to Nigeria. So as to be able to make proper economic policies that goes in line with the trend. This study employs the use of ARIMA Model approach to predict the future value of foreign direct investment inflows based on the existing or current historical data. Studies on the subject matter of modelling and forecasting the foreign direct investment inflows are relatively low, and existing studies in this regard such as Thabani and Wellington (2019) failed to forecast

beyond the years forecast of this study. This study therefore seeks to fill the gap in literature by forecasting foreign direct investment inflows in Nigeria over the next decade and also contribute to the existing literature in this regard.

LITERATURE REVIEW

This section entails the review of theories, different studies, views and opinions on the concepts and some empirical discussions around forecasting foreign direct investment inflows in Nigeria.

2.1 Conceptual Review

According to Adamu (2018), foreign direct investment affects the local or host country positively either directly or indirectly. As posited by Lagrendijk and Hendrikx (2009), foreign direct investment affects the host economy in many ways, from assets, technology and capital inflows and to creation of job opportunities in the country. The indirect effect relates to an increase in demand for secondary goods and services that helps an economy to be opened for extra means of technology and finance and demand for more workers. The benefits associated with foreign direct investment may not likely occur if there are no strategic policy arrangements put in place by the host country.

As far as the host country puts in place a conducive business environment for the foreign investment, then foreign direct investment inflows can play a significant role with benefits of creating employment opportunities, poverty reduction and increased growth and development, augment savings, promoting international trade by uniting into the world economy and enhancing modern technology transfer (Dupasquier and Osakwe, 2006; Gui-Diby and Renerd, 2015)

2.1 Theoretical Literature Review

The existence of foreign direct investment can be attributed to the proposition of some theories; this study therefore considers Hecksher-Ohlin model and Product Life Cycle theory.

Hecksher-Ohlin model explains that countries will import products that require the use of their limited resources and export products that require the use of their surplus resources or production factors.

The Product Life-Cycle indicates that there are four (4) developmental stages a product passes through and these stages are: I. The innovative stage. II. The take off stage. III. The maturity stage and IV. The decline stage; in the innovative stage and take off sage, the firm will begin production for the domestic or local market. In the maturity stage, as the firm product tends to grow the firm will then start exporting the product out of the domestic market to international market or start exporting to other countries, in the decline stage which is the final stage, some rival firms start producing the product and then start exporting and selling to other countries and also to the innovative firms existing in the domestic country. This model explains that foreign direct investment moves from the developed economies to the developing economies and this goes vice-versa.

2.3 Empirical Literature Review

Adamu (2018) forecasted foreign direct investment inflows from United States (USA) to Nigeria over ten years period using net foreign direct investment inflow as a variable with data spanning from 1982 to 2017. The forecast technique used in the study is the Exponential Smoothing (EST) algorithm. The study reveals that there will be a slow positive increasing trend of foreign direct investment inflow from USA to Nigeria with a growth rate of about 2.1% to 3.0% over the forecast periods.

Thabani and Wallingon (2019) predicted the net foreign direct investment in Nigeria using an annual time series data for net foreign direct investment from 1960 to 2017. The study carried out the prediction by using Box-Jenkins ARIMA model technique. The result of the study shows that net foreign direct investment in Nigeria is likely to decline over the next 10 years.

Biwas (2015) analyzed net foreign direct investment by using the ARIMA model approach. The scope of the study is India from 1992 to 2014. The study focused on predicting the net foreign direct investment in India up to 2034. The study reveals that foreign direct investment in India will exhibit an upward or increasing trend from 2015 to 2034.

Jere *et al* (2017) modelled and forecasted net foreign direct investment inflows in Zambia. The scope of the study is Zambia from 1974 to 2014. The methodology used in the study is Box-Jenkins ARIMA model. The study finds that the annual net foreign direct investment inflows in Zambia will increase gradually of about 44.4% by 2024.

Nyoni (2018) observed the modelling and forecasting of foreign direct investment inflows in Zimbabwe, the years of observation spans from 1980 to 2017. The forecast was carried out using the ARIMA model approach. The result of the study shows that the net foreign direct investment inflows in Zimbabwe will follow a poor and discouraging growth track.

METHODOLOGY

The section examines issues around the nature, sources, measurements and attributes of the historical data employed in the study for forecast in order to achieve the objective of the study. The study aims at modelling and forecasting the foreign direct investment inflows in Nigeria over the next decade using the ARIMA Model approach.

3.1 ARIMA Model

According to Song *et al* (2003) ARIMA model (Autoregressive Integrated Moving average) is considered to deliver a more correct and accurate forecast. Wan (2018) also posited that ARIMA model derives information included in the autocorrelation pattern of a forecast. The ARIMA model is an econometric approach that uses its own historical data or the past values of a variable to predict the future trend of that variable, it's propose the intuition of "let the data speak for itself".

Goh and Law (2002) argued that naïve models and smoothing technique is less superior to the ARIMA model and so makes the ARIMA model the most preferred technique to use in forecasting or prediction. Asteriou and Hall (2007) explains that ARIMA model is developed by Box and Jekins in 1970s and the idea of defining and identification, estimation and post estimation or diagnostics is formulated on the parsimony principle.

The first step to take in the model selection when using an ARIMA model is to difference the series so as to be able to attain stationarity in the series. After achieving stationarity, the correlogram will be examined so as to determine and conclude on the correct orders of the components of AR and MA. It is also important to know that the steps of selecting the AR and MA components is not based on same perspective of researchers but use of personal decision because there are no specific rules as to how to decide on the appropriate components of AR and

MA. The next step to carry out the estimation of the model and then a diagnostic testing will then follow. When performing the post estimation or diagnostic testing, it is usually done by spawning the residuals and then test if they satisfy the attributes of a white noise process and if they do not, it is important to carry out another estimation or re-estimation of the model by going through same process. Nyoni (2018) indicated that this process would go on and on until an appropriate model is determined or identified which satisfies the researcher.

3.2 ARMA Model Specification

In order to model the foreign direct investment inflows in Nigeria using the ARIMA model approach the ARIMA model (p, d, q) is therefore specified as;

$$FDI_t = a + bFDI_{t-1} + u_t \quad 3.1$$

$$FDI_t = a + bLFDI + u_t \quad 3.2$$

Equation 3.2 can also the expressed as

$$(1 - bL)FDI = a_0 + u_t \quad 3.3$$

Equation 3.1 is explained by the first lag and the equation is 3.1 is further expressed in equation 3.2 and 3.3. The L in equation 3.2 is being taken care of by $t - 1$ therefore, L is also the first lag of FDI and so equation 3.1 explains that FDI is being explained by its first lag.

Therefore what the equation expresses is that what will happen to future FDI in time $t + 1$ is dependent on the behavior of the series in the present time, t. Recalling that one of the key assumptions of ARIMA modelling is stationarity, therefore it is assumed that the absolute value of the parameter b is less than 1 i.e $|b| < 1$.

The Generalized $AR(p)$ model

The autoregressive model can generalized to add more lags of the series, as such that the value of p or figure in parentheses denotes or tells the number of lags in that particular model. Going by these, the model is specified as

$$AR(2): FDI_t = a + b_1 FDI_{t-1} + b_2 FDI_{t-2} + u_t \quad 3.4$$

$$AR(3): FDI_t = a + b_1 FDI_{t-1} + b_2 FDI_{t-2} + b_3 FDI_{t-3} + u_t \quad 3.5$$

$$AR(p): FDI_t = a + \sum_{i=1}^{p} b_i FDI_{t-i} + u_t \quad 3.6$$

From equation 3.4, an $AR(2)$ simply shows that the dependent variable is being explained by 2 lags and same things goes for equation 3.5 which is an $AR(3)$ model. Therefore an $AR(p)$ process from equation 3.6 shows that the dependent variable is explained by p lags and so equation 3.6 is the generalized form.

The $MA(1)$ Model

Similarly to $AR(1)$ model, easiest of the moving average is the first order moving average and this can be specified as

$$FDI_t = \boldsymbol{\gamma} + d_0 + d_0 u_{t-1} \quad 3.7$$

Equation 3.7 shows that FDI is being explained by current error and the first lag of the error term.

The Generalized $MA(q)$ Process

The moving average (MA) model can be generalized to include or add more lags of the stochastic term, such that the values in parenthesis indicates the number of lagged values.

The model is specified as

$$MA(2): FDI_t = \boldsymbol{\gamma} + d_0 u_t + d_1 U_{t-1} + d_2 u_{t-2} \quad 3.8$$

$$MA(q): FDI_t = \boldsymbol{\gamma} + d_0 u_t + \sum_{j=1}^{p} d_j u_{t-j} \quad 3.9$$

From equation 3.9 the $MA(q)$ process shows that the dependent variable is explained by q lags of the error term.

ARMA Model

From the $AR(p)$ and $AR(q)$ models, it is observed that there is a pattern in which FDI is explained by its own previous values and the current and past values of the error term, it is therefore refers to as the $ARMA(p,q)$ model which specified as

$$ARMA(1,1): FDI_t = a + b_1 FDI_{t-1} + d_0 u_t + d_1 u_{t-1} \quad 3.10$$

$$ARMA(p,q): FDI_t = a + \sum_{i=1}^{p} b_i FDI_{t-i} + d_0 u_t + \sum_{j=1}^{q} d_i u_{j-i} \quad 3.11$$

$ARMA(p,q)$ Model is being specified when the lags of the dependent variable is being combined with the lags of the error term. $ARMA(p,q)$ Show that FDI is a function of p lags of FDI and q lags of the error term.

Since most economic variables are non-stationary they have to go through a transformation process which is refers to as differencing so as to become a stationary series and the transformation process is also refers to as integration and this brings about the autoregressive integrated moving average (ARIMA). Also, ARIMA model helps to inform that the series being used has gone through a process of integration before it can be used for any empirical analysis.

3.3 ARIMA Model Specification

ARIMA (p,d,q) as the specification of ARIMA is explained based on the components in the model, p tells the number of lags of the dependent variable while d tells the number of times the variable has been integrated before becoming stationary and q the number of lags for the MA process.

Using some scenarios; An ARIMA (1, 1, 2) simply tells that there is an autoregressive which uses one lag of the dependent variable and that is why the first value in parenthesis is 1 i.e. p, and the other 1 = d shows that it is a first stationary series while the 2 = q tells that there are 2 lags of the error term in the model.

The same process can be use to interpret an ARIMA (1, 0, 1) but it's important to know that ARIMA (1, 0, 1) is same as ARIMA (1, 1) if the series is stationary in level. Therefore using an ARIMA Model, it is important to know the values of (p, d and q).

Having understood the rudiments behind ARIMA modelling, the four major processes in the ARIMA model involve identification which has to do with identifying the model to be used, followed by estimation, diagnostic checking and then forecasting.

3.4 Data Collection, Sources and Measurement

This variable used in this paper for its forecast is net foreign direct investment inflows based on 50 observations of annual foreign direct investment inflows in Nigeria from 1970 to 2020. The data is measured in foreign currency which is US dollars. The data source is World Bank database which is widely known and used for generating or sourcing of macroeconomic data.

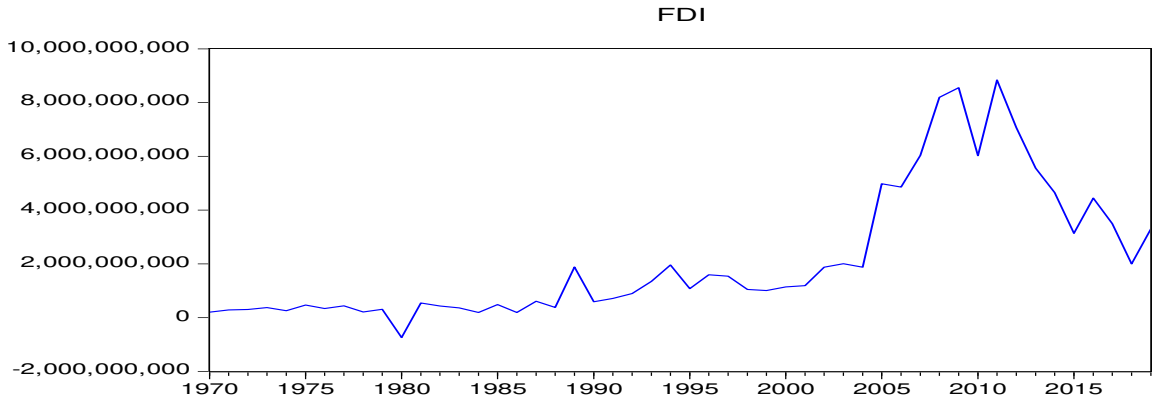
ARIMA MODEL ESTIMATION

In order to ascertain the main objective of the study, which is to forecast the net forecast the net foreign investment inflows in Nigeria for the next decade, the adoption of ARIMA Model is used. The ARIMA model involves four major stages which will be critically analyzed in sequence under this section.

4.1 Identification

There is need to identify the appropriate model to be used for further process before forecasting. To identify the appropriate lags for the AR and MA process, it requires the correlogram which is the plot of autocorrelation function and the partial autocorrelation against the lag length. The partial autocorrelation measures the correlation that exists between the time series observations that are in k terms apart after the control for correlations at the intermediate lags. In simple terms, the partial correlation is just the correlation between Y_t and Y_{t-k} after removing the effect of intermediate Y's basically it means the measuring of impact is being done in this case. It should be noted that, if both autocorrelation function and the partial autocorrelation function follows the same pattern, the model to adopt is the ARMA model and the AR and MA do not move in the same direction. In carrying out the identification process, there is need to plot the series to show or visualize if the series is stationary or not.

Fig 4.1



Trend of Foreign Direct Investment in Nigeria From 1970 2019

The graphical representation in fig 4.1 shows the trend of foreign direct investment inflows in Nigeria under the year of observation. To determine if the series is stationary, there is need to check the correlogram and this clearly shows that the series is not stationary after checking the correlogram as both autocorrelation function (ACF) and the partial autocorrelation (PACF) function are outside the 95% confidence intervals. Taking the first difference of the correlogram, both the autocorrelation function and the correlation function exhibit and exponential decay in similar pattern which shows that it is not strictly an AR and MA process but an ARIMA model.

To determine the ARIMA pattern for the differenced FDI series, there is need to capture the significant lags of both ACF and PAC which are lags 3 and 7 in the correlogram. To avoid over parameterized model, there is need to pick the model that gives the smallest parameters to be estimates so as to achieve parsimonious model (Box and Jenkins, 1970). The model that can be deduced from the correlogram result will be an ARIMA (1, 1, 1); which means using 1 lags of AR and 1 lag of MA, ARIMA (1, 1, 3); ARIMA (3, 1, 1); and ARIMA (3, 1, 3). The models listed are tentative since the appropriate model has not been determined but it is done to extract the ARIMA model from the series.

4.2 ARIMA Model Estimation

In selecting the appropriate model after the estimation has been carried out, there are some very important indicators from the result that needs to be considered before making conclusions on the result being generated from the estimation.

The criteria for picking the appropriate model is to go for a model that has the most significant coefficient, the model that has the least volatility because it makes more sense for an economic variable to be less volatile, also, the model that has the lowest Akaike info criterion (AIC) and the model that has the highest Adjusted R-squared.

Table 4.1: ARIMA Model Estimation Result

D(FDI)	ARIMA (1, 1, 1)	ARIMA (1, 1, 3)	ARIMA (3, 1, 1)	ARIMA (3, 1, 3)
Significant Coefficients	0	2	2	0
$Sigma^2$ (Volatility)	1.04	8.86	9.32	1.01
Adj R^2	0.01	0.16	0.11	0.034
AIC	44.49	44.33	44.38	44.46
SBIC	44.64	44.49	44.53	44.62

Source: Author's Compilation

As stated earlier under this section that the ARIMA model to be selected as the appropriate model for the most or correct estimation should follow some specified criteria, the criteria involves picking the model that meets the follow; most significant coefficient, least volatility, lowest AIC and SBIC and highest Adjusted R-squared.

From the estimated model in Table 4.1 it can be seen that ARIMA (1, 1, 3) meets the specified and required criteria and thus, the most appropriate model for the estimation.

4.3 Diagnostic Test

In order to be fully certain that the best model as discovered is satisfied, there is a need to take the result into diagnostic checking so as to be certain that there is no information left in ARIMA (1, 1, 3) that is left without being captured.

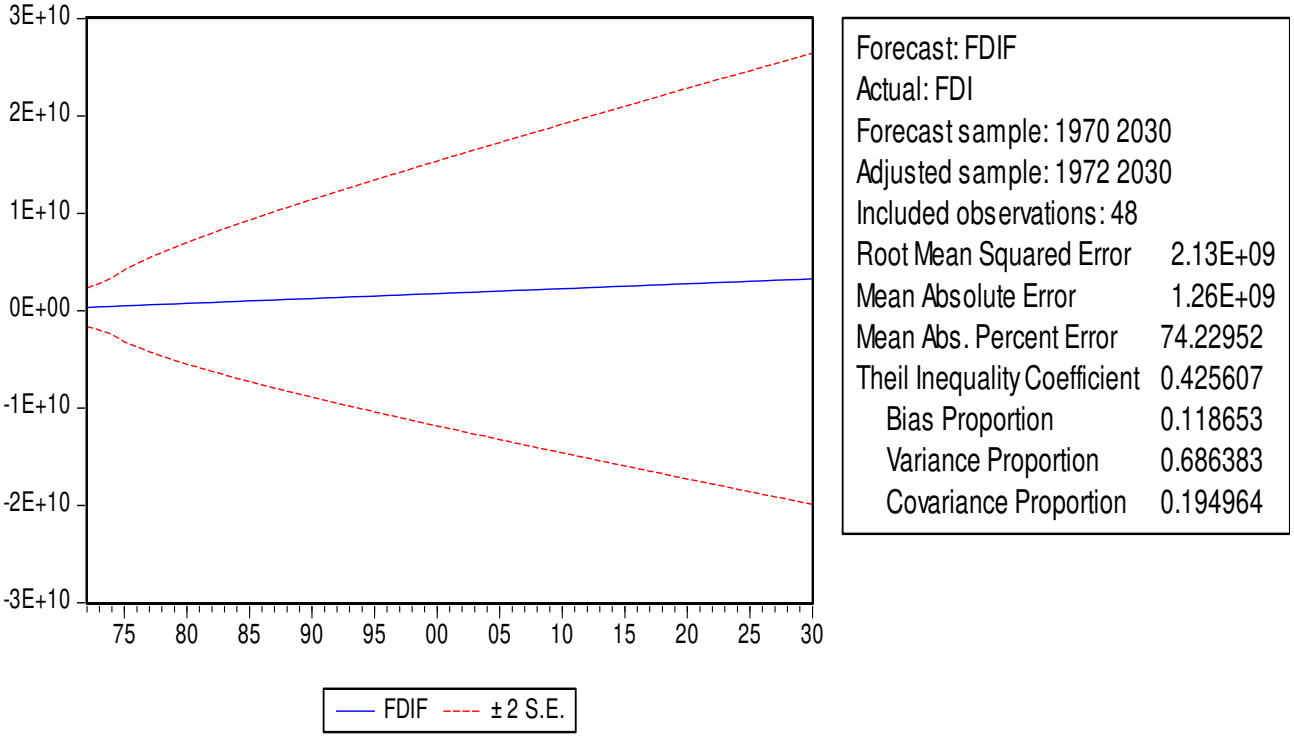
The diagnostic test result shows the correlogram is flat that all the lag structures are within the 95% confidence interval or the standard error bounds; therefore ARIMA (1, 1, 3) model is appropriate, correct and preferred since no information is left without being captured.

Since all information is being captured the ARIMA (1, 1, 3) the forecast will therefore be based on the model.

The autocorrelation test result also shows that there is no presence of autocorrelation in the model as the probability values greater than the 5% significant level

4.1 Foreign Direct Investment Inflows Forecast

The essence for fitting ARIMA modelling in this study is to forecast the future values of the foreign direct investment inflows in Nigeria. After all the first three necessary steps in sequence have been carried out, satisfied and accurate, the forecast of foreign direct investment inflow is therefore carried out. The model to be use for forecast is the ARIMA (1, 1, 3).



Source: Author's Compilation

The graph in fig 4.2 shows the forecast graph for foreign direct investment inflows and it lies in between ±2 standard error or the 95% confidence interval. To know how close the forecast is to the actual values, there is need to plot the forecast graph against the actual graph to know how well the series has been predicted.

However, to know how accurate the forecast is, the forecast graph will therefore be plotted against the actual FDI values.

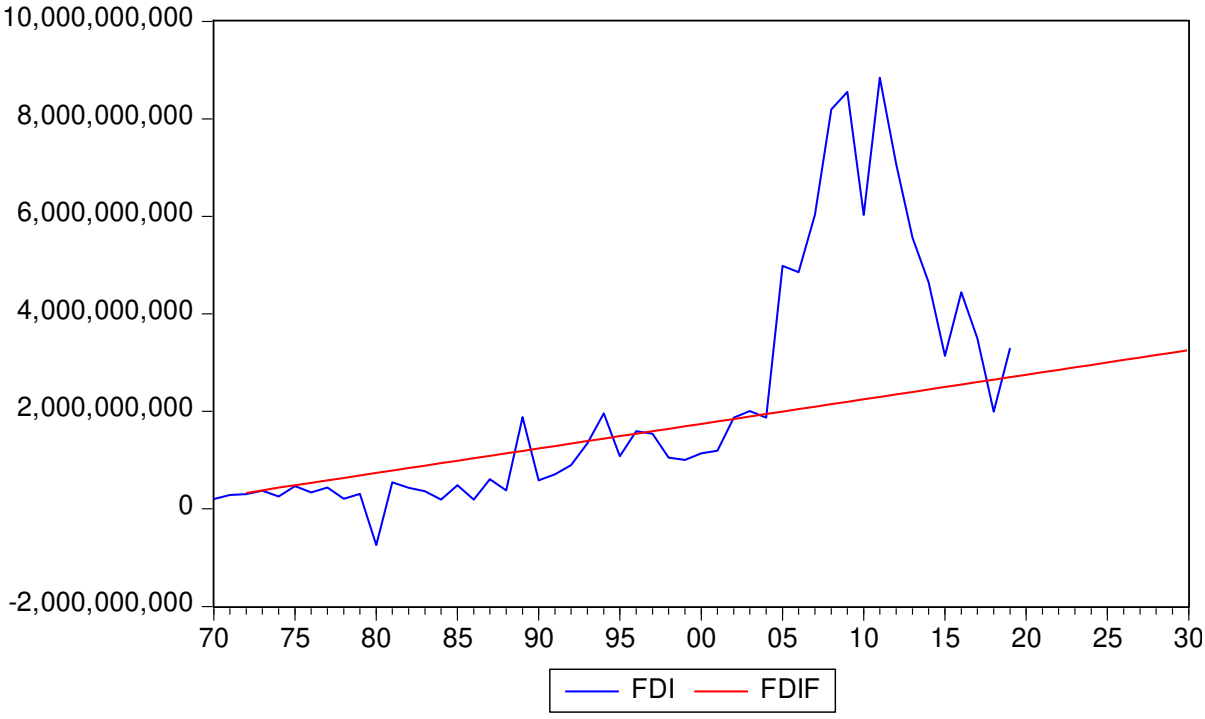


Fig 4.3: Forecast Graph of FDI Inflows in Nigeria from 2021 to 2030

Source: Author's Compilation

The graph represented in fig 4.3 shows the trend in the FDI inflows in Nigeria over the next decade i.e. from 2021 to 2030. It can be deduced that between the years 2006 and 2013 there occur a large deviation from the actual FDI and the forecasted FDI while the remaining years are almost exact therefore the overall, the forecast is good. Also, the optimal model, the ARIMA (1, 1, 3) model predicts that Nigeria's foreign direct investment inflows is expected to be lingering or settle around 2.80 billion USD and 3.26 billion USD over the next decade except there are some specific or certain government policies that are modified most especially relating to remodeling or bettering the investment nature in Nigeria.

It is essential to know that the essence of ARIMA modelling is for forecast and a researcher might not likely to make an exact forecast because the aim is just to forecast future values.

CONCLUSION AND POLICY RECOMMENDATION

This study shows that ARIMA (1, 1, 3) model is the most suitable, the best and appropriate model to achieve the objective of modelling and forecasting net FDI inflows in Nigeria. However, this study further shows that the net foreign direct investment inflows in Nigeria are expected to decline slightly and hang around the recent years level of FDI inflows in Nigeria if

nothing is being done to improve and better the investment face in the economy. There is therefore a need to significantly raise foreign direct investment in Nigeria in order to boost growth, create employment opportunities and for future development level to be achieved.
Since it is clear evidence from the forecast that what is likely to happen to FDI inflows in Nigeria is similar to the current rising issue or situation of FDI inflows in Nigeria in the recent time as FDI inflows in Nigeria have been forecasted to be around 2.80 billion USD and 3.26 billion USD which is not significantly different from around the FDI inflows recorded since 2016 as there is large drop as compared to 2015. There is therefore a need for strong policies that needs proper and adequate follow up in Nigeria. There is need for policies that are purpose driven with defined objectives and goals, foreign direct investment attraction strategies that are purely realistic and not the current ones with no concrete actions on it but a mere saying.

After the application of Box-Jenkins ARIMA Model approach in predicting the net FDI inflows for Nigeria. Also, from the conclusion, this study provides that the Nigerian government should make sure that FDI inflows in Nigeria does not go lower than the forecast value as this might be a serious deterioration, the government should then improve investment relationship with major investors in Nigeria so has to help accelerate the FDI inflows growth. Also, the government needs to tackle the issue of insecurity and power supply which has to do with political instability as no foreign investor would want to open his business to theft and bad security situation in the country while a stable power supply will also encourage foreign investors in investing in Nigeria because this helps to reduce cost in an organization and also improve productivity. Government should also place focus in attracting more foreign investors from to invest in the manufacturing, agricultural and financial sector as investing in these sectors will surely help to stimulate employment, develop the sectors and also helps to boost the productivity of the domestic firms.

REFERENCES

Asiedu, E. (2002). On the determinants of foreign direct investment to developing countries: is Africa different? World development, 94(2), 263-276.

Adamu, J. (2018). Forecasting FDI Inflows from the United States (USA) to Nigeria over Ten years Period, 3(3), 2544-5966.

Asteiou and Hall (2007) Applied Econometrics, Revised Edition.

Gujaraji and Porter (2009) basic Econometrics, 5th Editiom

Adamu, J. (2018). Predicting Net Foreign Direct Investment in Nigeria using Box-Jenkins ARIMA Approach. Journal of Economics and Finance, 4(2) 2520-7490.

Dinda, S. (2009). Factors attracting FDI to Nigeria: An empirical investigation, Madras School of Economics, Chennai.

Ghebrihiwet, N., and Motchenkova, E. (2017). Relationship between FDI, foreign ownership restrictions, and technology transfer in the resources sector: a derivation approach, Resources Policy, 52: 320 – 326.

Goh, C., and Law, R. (2002). Modeling and forecasting tourism demand for arrivals with stochastic non stationary seasonality and intervention, Tourism Management, 23: 499 – 510.

Nyoni, T., and Bonga, W. (2018). What Determines Economic Growth In Nigeria? DRJ – Journal of Business and Management, 1 (1): 37 – 47.

Nyoni, T. (2018). Modeling and Forecasting Inflation in Kenya: Recent Insights from ARIMA and GARCH analysis, Dimorian Review, 5 (6): 16 – 40.

Olayiwola, K., and Okodua, H. (2013). Foreign Direct Investment, non-oil exports, and economic growth in Nigeria: a causality analysis, Asian Economic and Financial Review, 3 (11): 1479 – 1496.

UNCTAD, (2020). World Trade Report.

Wooldbridge J. (2009). Introductory Econometrics: A Modern Approach 4th Edition.