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EASE OF DOING BUSINESS, CORRUPTION AND DOMESTIC INVESTMENT NEXUS IN NIGERIA: A BOOTSTRAP ARDL APPROACH

Aliyu Umar

Department of Economics, Umaru Musa Yar'adua University, Katsina

Jibrin Zakari

Department of Economics and Development Studies, Federal University Dutsin-Ma, Katsina

Ibrahim Haruna Abdulkarim

Department of Economics and Development Studies, Federal University Dutsin-Ma, Katsina

Abstract

Despite abundance studies on corruption-domestic investment nexus, little has been done to examine the connection between ease of doing business, corruption and domestic investment in Nigeria. Therefore, this study examines ease of doing business, corruption and domestic investment relationship in Nigeria from 2004Q1 to 2021Q4 using recently developed Bootstrap ARDL approach. The results confirmed that there is a long-run relationship between ease of doing business, corruption, lending rate, GDP growth rate, saving and domestic investment. The outcomes from the estimation reveal that reducing corruption increases the level of domestic investment growth in Nigeria. Also, an increase in ease of doing business index promotes domestic investment in Nigeria. Therefore, the study recommends that; government should employ policies that will reduce corruption in order to raise domestic investment in the country. In particular, government can sustain the fight against corruption via increased funding of the anti-graft agencies. In addition, government should create enabling business environment for investment to grow through effective policies and programs.

Keywords: Ease of Doing Business, Corruption, Domestic Investment, ARDL and Nigeria

1. Introduction

Long-term economic growth is determined by the level of investment both in developed and developing economies (see Solow, 1956; Swan, 1956). In particular, a reduction in the widespread poverty and unemployment which are the major challenges of the developing countries can be addressed through a sustained increase in domestic investment (Umar & Zakari, 2020). Furthermore, according to the World Bank (WB), the average investment (% of GDP) in the world stood at 24% in 2019. For example, in 2020, domestic investment for Uganda and Ethiopia accounted for 25% and 31% respectively, while Nigeria's domestic investment in the same year was 24%. This indicates that variation exists in the growth of investment especially in developing nations. Therefore, developing nations need to invest more in infrastructural development (WB, 2020).

In Nigeria, domestic investment (DI) is doing well in terms of poverty reduction and employment opportunities especially in agricultural and manufacturing sectors where a large number of jobs are created in the country (see Iya & Aminu, 2015; Munir, 2011). Moreover, the World Bank report shows the performance of DI in Nigeria over the years. For instance, in 2004, DI stood at 7.19%, but significantly increased to 14.42% in 2010 before declining to 12.09% in 2011. In addition, significant improvement was recorded in 2020 as the figure stood at 28.64% (WB, 2020).

It might be possible that, Ease of Doing Business (EDB) contributes to the increase in the performance of DI in Nigeria. For instance, investors prefer less uncertain economic environments for their investment (Kelsey & le Roux, 2018). In the same vein, the EDB contributes to the

advancement of living standards and generates capital through entrepreneurial innovations that are environmental-friendly. A good business environment enables both foreign and domestic businesses to prosper more and contribute better to the economy (Yunusa, Zakari & Umar, 2021). In addition, Independent Evaluation Group (IEG) reported that firms are more likely to improve if they have access to fewer, cheaper, and simpler regulations, because overregulation affects business activity, thereby retarding investment growth (IEG, 2020).

As part of the effort to create a favorable business environment, the Nigerian Immigration Service (NIS) reviewed the requirements for business visas to make them more customer-friendly. Additionally, the present government has introduced digital and free registrations of firms with a view to making business regulatory requirements more easily, much faster processing times and making the overall economy more business-friendly.

Despite the efforts taken by the government to create an enabling environment for investment and businesses to growth, Nigeria's ease of doing business lags behind compared to some of the developing countries like Ghana and South-Africa. For instance, EDB ranking for Nigeria decline from 146 in 2018 to 131 in 2019, while Ethiopia and Mali rankings moved from 159 and 145 in 2018 to 148 and 159 in 2019, respectively (WB, 2020). Whereas, an improvement of EDB index is very important for rising DI, corruption can be an impediment or otherwise to the growth of investment. Moreover, Abu (2015) confirmed that corruption discourages investment both private and public sectors since businesses have to pay bribes to government officials to collect permit and license for contracts, including registration of their business. In addition, Umar and Zakari (2020) established that corruption affects the level of investment; it reduces the production of capital goods, and hence, declines DI in the country. Furthermore, the various reports by Transparency International (TI) affirmed that, Nigeria is among the most corrupt countries in the world. More recently, corruption in Nigeria remained high 26% compared to

some of the developing countries like Gambia 37% and Senegal 45%, respectively (TI, 2019). Several studies evaluated corruption and DI relationship (see Asiedu & Freeman, 2009; Umar & Zakari, 2020; Wei, 2001). Little has been done to examine the connection between EDB, corruption and DI particularly in Nigeria. The remaining paper contains the following; next section presents the review of empirical literature. Theoretical framework and specification of the model are discussed in third section. The fourth section discusses the empirical results and findings. Lastly, is the final section which consists conclusion and policy recommendation.

2. Literature Review

Various empirical studies were conducted on the nexus between corruption and domestic investment relationship in both country specific and panel analysis (see Fabayo, 2011; Tripathi & Kumar, 2014; Umar & Zakari, 2020). However, studies looking at the relationship between ease of doing business, corruption and domestic investment particularly in Nigeria are almost non-existence. Some of the studies on corruption and domestic investment relationship are; for instance, Pellegrini and Gerlagh (2004) investigated the effect of corruption on investment by applying two-stage least square (2SLS) estimation in 20 OECD countries from 1975 to 1985. The result demonstrates that corruption negatively affect investment. Furthermore, Meon and Sekkat (2005) investigated corruption-investment nexus in 63 countries from 1970 to 1998. Using the Generalized Least Square (GLS) technique, the results show that corruption has a negative effect on investment growth.

In addition, Javorcik and Wei (2006) examined the effect of corruption on public investment during the period 1996-2001. The study employed 3SL method in 64 countries, the results illustrate that corruption distorts public investment in the countries. Also, Dal-Bo and Rossi (2007) examined corruption and investment link in 13 Latin American countries from 1994 to 2001 using pooled OLS and dynamic panel estimations techniques. The outcomes demonstrate that corruption strongly affects the level of public and private investment in the countries. In addition, Balia moune-Lutz and Ndkumana

(2008) assessed the impact of corruption on domestic investment for a sample of 33 African countries from 1982 to 2001. GMM estimation technique was employed and the empirical findings portray that corruption has a negative and significant effect on domestic investment.

Moreover, Haque and Kneller (2008) evaluated the corruption and domestic investment relationship in ten SSA region during the 1970 to 1999 period. Three-Stages Least Squares (3SLS) method was employed and the results indicate that corruption reduces domestic investment and makes it ineffective. The pooled OLS technique was used by Everhart, Vasquez, and McNab (2009) during the 1984-2008 period to examine the corruption and domestic investment relationship for over 100 countries. The results establish that corruption negatively affects domestic investment. Asiedu and Freeman (2009) used a panel regression approach from 1984 to 2006 evaluated the nexus between corruption and investment in Sub-Sahara African (SSA) countries. The results show that corruption has no impact on growth of investment in SSA.

Also, Dartanto (2010) used pooled OLS method to examine the relationship between corruption and investment in Indonesia from 2004 to 2006. The empirical findings reveal that corruption affects public investment negatively. In Nigeria, Fabayo (2011) studied the effect of corruption on investment climate during 1996-2010 period. The author used (OLS) method and the findings portray that corruption leads to low investment in the country. Moreover, Das and Parry (2011) examined corruption and investment relationship in 74 developing countries over the period 2000-2008. They employed Generalized Method of Moments (GMM) technique, and the results demonstrate that the impact of corruption on domestic investment is strongly positive in the developing countries. Tripathi and Kumar (2014) analyzed the effect of corruption on domestic investment in 90 less developed and emerging economies from 2002 to 2010. Using panel Chi-squared Tobit method, the results reveal that corruption and domestic investment are negatively correlated. Similarly, Umar and Zakari (2020) investigated Corruption and Domestic Investment nexus in Nigeria from 1996 to 2017

using quarterly data. The authors used Autoregressive Distributed Lag (ARDL) approach and the findings show that, there is inverse and significant relationship between corruption and domestic investment in Nigeria. Abu and Abdkarim (2020) used Non-Linear ARDL technique and examine corruption and domestic investment nexus in Nigeria from 1996Q1 to 2019Q4. The empirical result shows that, the relationship between corruption and domestic investment is non-linear.

Considering the existing empirical reviewed, it is clear that studies on the relationship between ease of doing business, corruption and domestic investment particularly in Nigeria are scarce. Moreover, most of the empirical studies focused on the relationship between corruption and investment (Abu & Abdkarim, 2020; Fabayo, 2011; Umar & Zakari, 2020). In addition, to the best of literature review none of such study was conducted in Nigeria.

2.1 Theoretical Framework

This study employed flexible accelerator theory to explain the stock of capital (investment) and its determinants. Therefore, following the work of Umar and Zakari (2020) and Le (2014), we assume that capital stock (investment) at time t is determined by the previous output levels (Y). This implies as;

$$K^* = \sigma Y \dots \dots \dots (1)$$

Where Y is the level of output, K is the fixed capital (investment), and σ is the Greek letter sigma representing capital/output ratio. It has been hypothesized that corruption influence investment growth (see Umar & Zakari, 2020; Wei, 2001). For the purpose of this study, the theory and the hypothesis were modified to include the ease of doing business index in the model. Beside the interest variables (ease of doing business, corruption), other variables such as lending interest rate and GDP per capita growth rate (GDPGR), domestic savings were included in the investment model (see Umar & Zakari, 2020). Employing all the variables in to equation 2, this implies as;

$$DINV_t = f(EDB_t, COR_t, GDPGR_t, LIRT_t, DS_t, \mu_t) \dots \dots \dots$$

A specific model in which domestic investment is dependent on ease of doing business, corruption and other variables is specified as follows;

$$DINV_t = \beta_0 + \beta_1 EDB_t + \beta_2 CORR_t + \beta_3 DS_t + \beta_4 LIRT_t + \beta_5 GDPGR_t + \mu_t \quad (5)$$

Where; β_0 is the constant or intercept, while $\beta_1, \beta_2, \beta_3, \beta_4$ and β_5 are parameters. Lastly, μ_t is the error term.

Domestic investment (DINV) is the dependent variable. It refers to gross fixed capital formation (GFCF) plus net changes in the level of inventories. Ease of doing business (EDB) is the difference between the performances of an economy against the ratio of best practice of forty-one indicators for the ten Doing Business measures. The EDB scores range from 0 to 100 signifying the lowest and top regulatory performance, respectively. Also, corruption (CORR) is the misuse of public power for private benefits, such as the bribing of public officials, taking kickbacks in public procurement of goods and services or embezzling of public funds. The Transparency International's (TI) corruption perception index (CPI), ranges from 0 (very corrupt) to 10 (very clean). The data for variables such as DINV, GDPGR, EDB, DS, and LIRT were collected from WDI (2020). Lastly, the data for corruption were obtained from TI (2020).

3. Methodology

The study uses quarterly data from 2004Q1 to 2021Q4 and examines the relationship among ease of doing business index, corruption perception index and domestic investment in Nigeria. The method used in this study is Autoregressive Distributed lag (ARDL) originally

introduced by Pesaran and Shin (1999) and further extended by Pesaran, Shin and Smith (2001). Several benefits are existing with this approach that may be contrasted with the Johansen and Juselius cointegration methods (see Abu, 2016; Abu & Staniewski, 2019; Umar & Zakari, 2020; Zakari & Umar, 2020). In addition, the researcher's intentions were to provide new empirical literature by testing the impact of the ease of doing business index and corruption on domestic investment in Nigeria using newly developed bootstrap autoregressive distributed lag (ARDL) testing technique as proposed by (McNown et al. 2018). The recent form of ARDL includes additional t-test $t_{dependent}$ or F-test $F_{independent}$ on the coefficients of lagged independent variables or coefficients of lagged dependent variables (Alhodiry et al., 2021; Goh et al, 2019). The critical values (CV) in the bootstrap ARDL approach lead to eliminating unstable results of the ARDL bounds testing model (Alhodiry et al., 2021; Goh et al., 2019). However, McNown et al. (2018) critical values gained by bootstrap simulation will lead to better results than the traditional ARDL bounds test. The Pesaran et al. (2001) CV allows for (1) endogeneity of all explanatory examined variables. Also, this approach is more suitable for data that contains more than one explanatory variable to be endogenous, while the CV generated with a bootstrap technique allows for the endogeneity of all explanatory examined variables. Moreover, the bootstrap ARDL test has one unique quality as compared to other bounds tests, it eradicates the possibility of indeterminacy (Caglar, 2020; Saleem et al., 2020). Furthermore, the Bootstrap procedure has the additional advantage of eliminating the possibility of inconclusive inferences (Lin et al., 2017). Furthermore, the long run model of ARDL is estimated as given as follows:

$$L(DINV)_t = \alpha_0 + \sum_{i=1}^b \beta_1 L(DINV)_{t-i} + \sum_{i=0}^k \beta_2 L(EDB)_{t-i} + \sum_{i=0}^v \beta_3 (CORR)_{t-i} + \sum_{i=0}^c \beta_4 L(SAV)_{t-i} + \sum_{i=0}^H \beta_5 (GDPGR)_{t-i} + \sum_{i=0}^u \beta_6 (LIRT)_{t-i} + e_t \quad 5$$

In order to get the short-run coefficients, an error correction model (ECM) is estimated. The ARDL specification of the ECM is represented as;

$$\Delta L(DINV)_t = \alpha_0 + \sum_{i=1}^h \beta_1 \Delta L(DINV)_{t-i} + \sum_{i=0}^j \beta_2 \Delta L(EDB)_{t-i} + \sum_{i=0}^c \beta_3 \Delta (CORR)_{t-i} + \sum_{i=0}^u \beta_6 \Delta (LIRT)_{t-i} + e_t \quad 6$$

4. Presentation and Discussion of Results

4.1 Unit Root Test

This study employed the Augmented Dickey- Fuller (ADF) and Phillips-Perron (PP) tests and examines the order of integration of the variables employed in the model. The results from ADF and PP tests in Table 1

Table 1: Results of Unit Root Test

		ADF Test		PP Test	
Variables	Level	Difference	Level	Difference	Stationary
LDINV	-0.3096	-6.9725***	-0.3800	-7.04516***	(1)
LEDB	-2.3840	-8.5254***	-2.3840	-8.5884***	(1)
CORR	-1.6707	-8.5552***	-1.6707	-8.5557***	(1)
GDPGR	-2.8052	-8.098***	-2.8012	-8.1028***	(1)
LRT	-2.1719	-8.3808***	-2.1719	-8.3858***	(1)
LSV	-1.5511	-8.4762***	-1.4893	-8.4840***	(1)
Source: Author's computation (2021). Note:*** denotes significance at 1% level.					

reveal that all the variables (LDINV, LEDB, CORR, GDPGR, LIRT and LSAV) have unit root at their level, $I(0)$, which means they are not stationary. After taking the first difference, the unit roots were eliminated and became stationary and therefore integrated are integrated of order one, $I(1)$.

4.2 Bootstrap ARDL Bounds Testing to Cointegration

This study employed Bootstrap ARDL bounds test approach and evaluates the existence of long-run cointegration between the variables in the model. The study conducted all the tests (F and T-test of lag level

variables, T-test of lag level dependent variable and F and T-test of lag level independent variables) highlighted by McKnown et al. (2018), and confirm a strong evidence of long-run cointegration between LEDB, CORR, GDPGR, LSAV, LIRT and LDINV in the model (see Table 2).

Table 2: Cointegration Results Using Bootstrap ARDL Bounds Test

Dependent Variable	F	tdep	findep	Result
LDINV	27.79***	14.70***	346.81***	Cointegration
Bootstrap-based table	CV	1%	5.62	12.579.05
		5%	4.12	7.335.77
		10%	3.46	5.204.43

Source: Author's calculation (2021), *** denotes statistical significance at 1% level. Note: F is the F-statistic for the coefficients, tdep denotes the t-statistics for the dependent variable, findep denotes the t-statistics for the independent variable.

4.3 Results of Selected Long-run and Short-run Models

Since the long-run relationship between the variables have been established using Bootstrap ARDL bounds testing to cointegration, the ARDL model was estimated. The optimal lag-length of (2, 5, 5, 5, 5, 5)

was based on Akaike Information Criterion (AIC). The results of the long-run and short-run models are presented in Table 3. For instance, the estimation result indicates that there is significant and positive effect between ease of doing and domestic investment in Nigeria both in the short-run and the long-run. 1 unit increase in ease of doing business index increases domestic investment by 0.04% and 0.003% both in the long-run and the short-run, respectively. Thus, improvement in ease of doing business raises domestic investment in Nigeria. This finding is consistent with previous studies (see Oriaku, 2021; Poi & Uzomba, 2021). This result reflects the situation in Nigeria where several efforts have been put in place to create enabling business environment through programs such as PEDEC, lowering cost of registration and license or business permit and tax holiday. This addresses the anxieties of both national and multinational companies when deciding to invest in the country (Morris & Aziz, 2011).

Moreover, another finding from the estimation indicates that reducing corruption has a significant and positive effect on domestic investment in the long-run. A 1 unit increase in the corruption index (decrease in corruption)

increases domestic investment by 0.08% in the long-run. However, corruption has an insignificant effect in the short-run. Thus, lowering corruption promotes domestic investment in Nigeria in the long-run. This finding is consistent with previous studies in Nigeria (see Fabayo, 2011; Folorunso, 2007; Umar & Zakari, 2020;). Therefore, reducing corruption encourages both private and public sectors and enhances investment growth since businesses don't have to pay bribes to government officials to collect permit and license for contracts, including registration of their business (Abu, 2015).

Another discovery from the estimation results is that domestic savings has a significant and positive effect on domestic investment in the long-run and the short-run both at 1% level, respectively. A 1% raises in domestic savings increase domestic investment by 0.052% and 0.03% both in the long-run and short-run. Moreover, GDP growth rate was found to have a significant and positive relationship with domestic investment in the short-run. An increase in GDP growth rate by 1% raises domestic investment by 0.01% in the short-run and the long-run. However, lending interest rate is found to be positive but insignificant effect on domestic investment in the long-run.

Table 3: Result of ARDL model

Panel A: Long-run Coefficients – dependent variable is LDINV				
Regressor	Coefficient	Standard Error	T-Ratio	Prob.
C	1.6597	0.0538	30.8121	0.0000
LEDB	0.0397	0.0106	3.7303	0.0008
COR	0.0810	0.0428	1.8917	0.0682
LSAV	0.0525	0.0074	7.0645	0.0000
LIRT	0.0099	0.0092	1.0763	0.2904
GDPGR	0.0104	0.0040	2.5864	0.0148
Panel B: Short-run Coefficients – dependent variable is Δ LDINV				
Δ LDINV _{t-1}	0.3143	0.0489	6.4174	0.0000
Δ GDPGR	0.0103	0.0006	14.9607	0.0000
Δ GDPGR _{t-1}	-0.0007	0.0003	-2.3169	0.0275
Δ GDPGR _{t-2}	-0.0005	0.0002	-2.0094	0.0536
Δ GDPGR _{t-3}	-0.0009	0.0002	-3.6599	0.0010

$\Delta GDPGR_{t-4}$	0.0035	0.0003	11.2921	0.0000
$\Delta LEDB$	0.0030	0.0010	2.8717	0.0074
$\Delta LEDB_{t-1}$	-0.0059	0.0011	-5.1795	0.0000
$\Delta LEDB_{t-2}$	-0.0058	0.0010	-5.3520	0.0000
$\Delta LEDB_{t-3}$	-0.0033	0.0010	-3.0981	0.0042
$\Delta LEDB_{t-4}$	-0.0117	0.0013	-8.9166	0.0000
CORR	-0.0283	0.0223	-1.2638	0.2160
$\Delta CORR_{t-1}$	0.0110	0.0203	0.5416	0.5921
$\Delta CORR_{t-2}$	0.0408	0.0170	2.3955	0.0230
$\Delta CORR_{t-3}$	-0.1049	0.0191	-5.4898	0.0000
$\Delta CORR_{t-4}$	0.0517	0.0232	2.2300	0.0334
$\Delta LIRT$	-0.0037	0.0013	-2.7796	0.0093
$\Delta LIRT_{t-1}$	-0.0008	0.0015	-0.5127	0.6119
$\Delta LIRT_{t-2}$	-0.0037	0.0013	-2.7866	0.0091
$\Delta LIRT_{t-3}$	0.0034	0.0012	2.7248	0.0106
$\Delta LIRT_{t-4}$	-0.0033	0.0015	-2.2087	0.0350
$\Delta LSAV$	0.0304	0.0010	29.8045	0.0000
$\Delta LSAV_{t-1}$	-0.0128	0.0018	-7.0354	0.0000
$\Delta LSAV_{t-2}$	-0.0009	0.0011	-0.8287	0.4138
$\Delta LSAV_{t-3}$	0.002	0.0011	1.7246	0.0949
$\Delta LSAV_{t-4}$	-0.0055	0.0011	-5.0317	0.0000
ECT_{t-1}	-0.2028	0.0132	-15.2804	0.0000
R-squared	0.999841			
F-statistic	27.79662			0.0000

Source: Author's computation (2021).

Furthermore, the one-lagged error correction terms (ECT_{t-1}) is negative and statistically significant which shows the adjustment from the short-run leading to the long-run. In addition, the result from the estimation meets our expectation since the coefficient of ECT_{t-1} is negative and significant at 1%, This result indicates that 20.28% deviations of domestic investment from the equilibrium will be corrected within the first quarter of the year.

4.4 Results of Diagnostic Tests

Table 4: ARDL-ECM Model Post Estimation Tests

Test statistic	Results
Serial Correlation: CHSQ(2)	0.233742[0.7931]
Functional Form: Reset F-stat (1, 29)	0.299301[0.5885]
Normality: Jargue-Bera	58.7582[0.0000]
Heteroscedasticity: CHSQ(30)	0.271405[0.9998]

Source: Author's computation (2021).

4.5 Results of Stability Test

The cumulative sum of recursive residuals (CUSUM) and cumulative sum of square of recursive residuals

The results of diagnostic tests from Table 4 indicate that there is no serial correlation among the residuals since the p-value is statistically insignificant (0.7931). Also, the study confirmed there is no omitted variable and the ARDL model is specified correctly because the F-statistic and the p-value are 0.299301 and 0.5885, respectively (see Table 4). In addition, the result reveals that the error terms are homoscedastic, and lastly, the residuals are not normally distributed as indicated by Jargue-Bera statistics

(CUSUMQ) tests were conducted. The plots of both CUSUM and CUSUMQ are within the boundaries (see Figure 1 & 2) which indicates, the parameters are stable in the long-run.

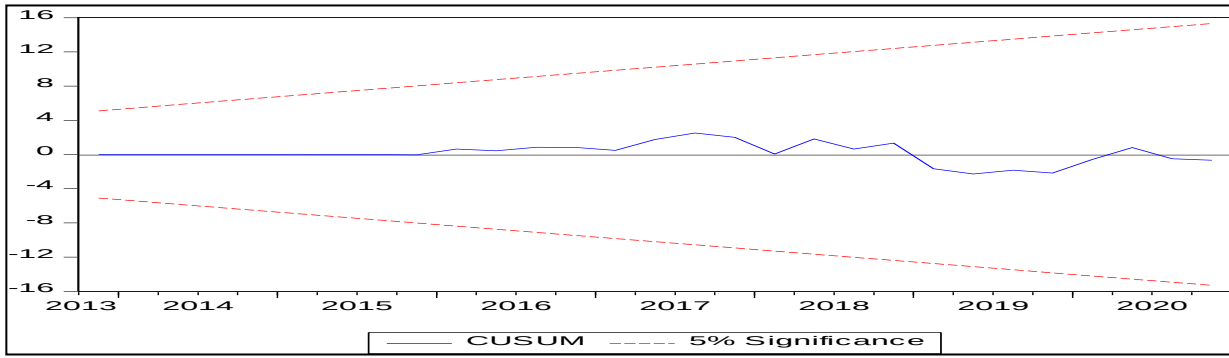


Figure 1: Plot of cumulative sum of recursive residuals

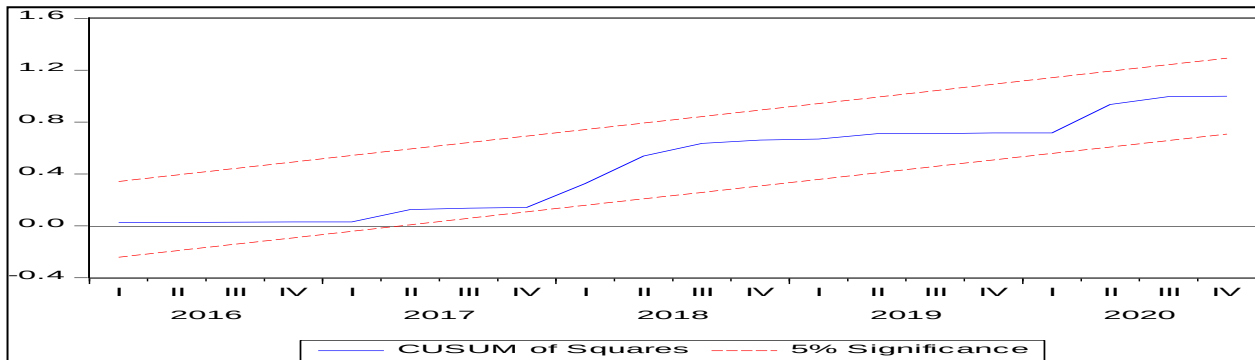


Figure 2: Plot of cumulative sum square of recursive residual

5. Conclusion and Recommendations

Domestic investment in Nigeria has been low over the years, while corruption remained high, and ease of doing business index is fluctuating continuously. This study evaluates corruption, ease of doing business and domestic investment relationship particularly in Nigeria from 2005-2020 using quarterly data. This study employed Bootstrap ARDL bounds approach and confirmed the existence of long-run cointegration among the variables. The empirical results from the ARDL model reveal that an improvement in the ease of doing business index promotes domestic investment in Nigeria. In addition,

reducing corruption is found to be significant in influencing domestic investment in Nigeria. That is, lesser corruption increases domestic investment and vice versa. Therefore, this study makes the following recommendations. First, government should employ policies that will reduce corruption in order to raise domestic investment in the Nigeria. In particular, government can sustain the fight against corruption via increased funding of the anti-graft agencies. Second, government should create enabling environment for businesses to grow that would attract domestic and foreign investor.

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