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# INDUSTRIAL SECTOR GROWTH, MACROECONOMIC PERFORMANCE, AND CORRUPTION IN THE SUB SAHARA AFRICA

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**Abstract**
The study investigates the impacts of macroeconomic performance and corruption on the industrial growth of the SSA. The industrial sector is seen as the engine of the economic development of any country and hence policies that will promote the growth of the sector cannot be over emphasized. The study investigated effects of macroeconomic variables such as exchange rate, economic growth, inflation rate and unemployment rate as measures of economic performance in the SSA on the industrial sector growth. Also quality of institutions effects on industrial sector is investigated using control of corruption as proxy. The preliminary diagnostic results show that Panel Auto-Regressive Distributed Lags P-ARDL is appropriate for the estimation and the results show that both macroeconomic performance and corruption have significant impacts of the industrial sector growth in SSA. However, an exchange rate that will encourage domestic production, minimum inflation, and unemployment rates, will guarantee sustainable growth in the industrial sector, while tightening grip on control of corruption.

**JEL Classification**: E02, H11, L16;

**Keywords:** Industrial sector growth, Macroeconomic performance, Corruption.

## 1. Introduction

Over the years economic researchers have postulated different theories which explain the rate at which developing economies can catch up with the developed ones. An important theory in this regard is the Rowstos stages of economic development (Freckleton, Wright, Craigwell, 2012). The summary of this idea is that industrialization remains the major factor that can bridge the gap between the underdeveloped and the developed economies. Consequently, efforts of developing countries across the globe have been geared towards improving their industries in order to achieve sustainable economic development that will enable them to catch up with the developed countries.

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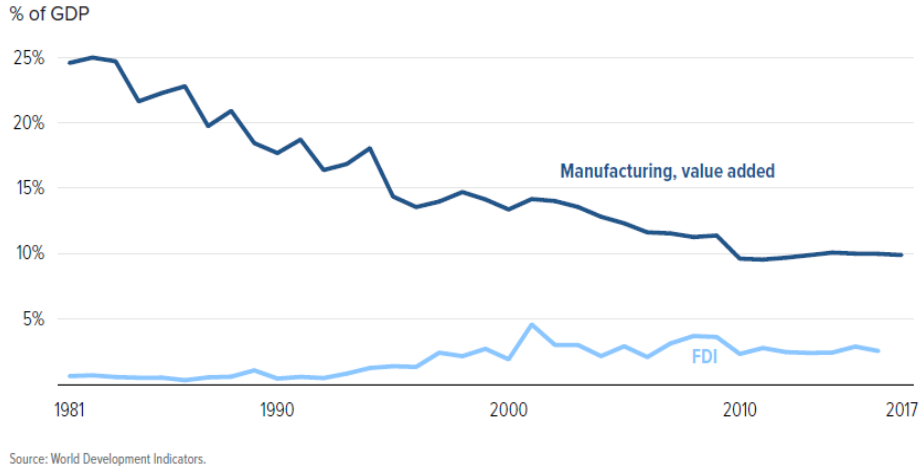
The Sub Sahara African SSA Countries remains one of the regions in the world with the least industrial growth and this has been affecting the economic development of the regions for quite a long time (Szeftel, 2000). The growth of the industrial sector in the SSA remains a priority to many international development agencies and this is has led to increase in funding to the sector from various international donor agencies (UNDP, 2015). For instance the Africa development Bank (AfDB, 2012) embarked on aggressive funding of the industrial sectors of the SSA by raising the fund to the industrial sector by about 45%. In addition, individual institutions of the countries in the SSA have been implementing policies that aimed at promoting the growth of the industrial sector by establishments of various local agencies and formulation of policies.

Notwithstanding, the performance of the industrial sector of the SSA over the years has left more to be desired going by the available statistics. For instance the manufacturing sector which is the most important sub sector of the industrial sector have been witnessing a downward trend in terms of growth in recent times. Figure 1 shows the declining trend of manufacturing value added and Foreign Direct investment FDI in the SSA. This is an indication that the problem of the industrial sector in the SSA requires a more pragmatic approach that goes beyond policy formulation. It is very evident from the figure that between 1981 and 2017, the manufacturing sector which is the fulcrum of the industrial sector has been witnessing a downward trend in terms of growth and value added during these periods.

**Figure 1. Manufacturing Value Added and FDI trend in the SSA**




Source: World Development Indicators

However, the irony f the issue is that the falling trend has continued unabated and this has further compounded the problems of the sector in the SSA. Generally, the economic performances of the SSA countries in terms of their economic growth, unemployment rate, inflation and exchange rate among other macroeconomic indicators have also been suggested by some authors as the likely causes of the unimpressive performance of the industrial sector of the SSA sub

region (Omoteso and Mobolaji, 2014). The fact behind this position is that good macroeconomic outlook portends good horizon for the industrial sector to thrive. However, this assertion remains within the premise of opinions without any empirical back up.

Again, some other school of thought argued that the quality of the institutions of the SSA is the major challenge that is facing the SSA industrial sector. They concluded that the rise in the cases of corruption and the weakness in control of corruption by the institutions of the SSA remain the greatest challenge to the industrial sector because it prevents creation of enabling environment that will enable investment to thrive.

These two schools of thought have remained dominants in the research on the industrial sector in the SSA however, little or no research work exist on investigation of the relationship between corruption, macroeconomic performance and the industrial sector growth in the SSA. Although, there are some studies on individual countries but none of them focused on the sub region as a whole. This could have served as a policy guide for regional, sub regional and international development agencies such as AFDB, World Bank and IMF among others who always look for sub regional findings to direct and redirect their areas of priorities in various sub regions, SSA inclusive.

Empirical literatures show that previous studies have been focusing more on the relationship between corruption and economic growth without giving attention to the industrial sector (Asiedu, Freeman, 2009). In addition the only study that investigated the impact of corruption on industrial sector was on Zimbabwe and not the SSA (Makochekanwa, 2009).

Consequently, this study investigates the impacts of macroeconomic performance and corruption on the industrial sector growth of the SSA sub region between 1995 and 2016. The remaining parts of the empirical studies are divided to the literature review, methodology, results ‘discussion, and conclusions.

## 2. Literature review

Makochekanwa (2014) investigated the impact of corruption on firms’ growth in Zimbabwe, using firm level data from 599 Zimbabwean firms which were surveyed in 2011 by the World Bank. The study empirically investigated the effects of corruption on firm level economic activities in the case of firms operating in manufacturing, retail and services sectors. The research made use of econometrics techniques. The results from the combined sample indicate that both capital stock and labour are positively related to a firm's level of productivity. Considering the three variables of our main interest, national corruption was the only variable which was found to be positively and significantly related to a firm's productivity. This implies that, in the case of Zimbabwean firms, national corruption enhances their productivity. Overall, the result supports the hypothesis that corruption is a 'grease' which lubricates the ‘squeaky wheels' of bureaucratic, rigid administration and inefficient governments particularly those of the developing world. The results showed that across the three sectors, capital-labour ratio is significant and positive as expected from economic theory.

Zafar (2017) investigated the growing relationship between China and Sub Sahara Africa in terms of trade investment and macroeconomic development. It

was a pure desk reseach that made use of descriptive statistics of historical data that shows the relationship between the two regions on macroeconomic performance, industrialization and trade. According to the author, the emergence of China as economic super power in the world in recent times had many effects on the global economy as a whole. This development made China to be more relevant in industrialization progress of the SSA. The improvement in trade between China and the SSA has led to increase in importation of oil from Sudan and Angola and timber form Timber from Central Africa. The effect of China relationship with SSA improved industrialization and trade in SSA to the tune of about 50 billion USD. However, the negative implication of this relationship is the inevitable effect of Dutch Disease that this can bring since China only import primary product from SSA. Therefore the relationship between SSA has both negative and positive implications on the SSA and the industrial sector of the Sub region as a whole.

Ahmad and Ali (2010) investigated the impact of corruption on the banking industry in some developed and developing countries. The investigated the impact of corruption on financial sector development. A panel of 38 countries was used in the study between 1995 and 2005. The countries included in the study comprised both developed and developing countries. System Generalized Method of Moments SYS-GMM was used. The result of the analysis indicated that corruption had adverse effect on financial sector development. Consequently, the study recommended effective control of corruption in order to have a developed financial sector.

Omotesho and Mobolaji (2014) examined the impact of governance indices (especially control of corruption) on economic growth in some selected Sub-Saharan African (SSA) countries for the period 2002 to 2009. Specifically, the study attempted to assess whether governance reforms (especially those relating to control of corruption) have any impact on the economic growth in SSA countries. It also examines whether simultaneous policy reforms have any impact on economic growth in the region. The governance indices used in this study were drawn from the PRS Group and the World Governance Indicators for the period of 2002 to 2009 while the real GDP per capita growth data were obtained from the World Bank Database. The study applied both random and fixed effect using maximum likelihood estimation to examine the effect of political stability and institutional quality on economic growth of forty-seven SSA countries. The result from the analysis show that both political stability and institutional quality have significant positive impact on economic growth of the sub region. On the contrary, corruption control failed to have significant impact on economic growth. It is recommended that governments in the SSA should intensify efforts on control of corruption and improve of their rule of law and political stability in order to achieve sustainable economic growth.

Asiedu and Freeman (2009) examined the Effect of Corruption on Investment Growth: Evidence from Firms in Latin America, Sub-Saharan Africa, and Transition Countries. According to them, the impact of corruption on investment has three common features: they employed country-level data on investment and corruption is measured at the country level. Data for countries from several regions are also pooled together. The study used firm-level data on investment and measured corruption at the firm and country level, and allowed the effect of corruption to vary by region. The dependent variable is firms' investment growth and the study employed six measures of corruption from four different sources—two firm-level measures and four country-level measures. The study found that the effect of corruption on

investments varies significantly across regions: corruption has a negative and significant effect on investment growth for firms in Transition countries but has no significant impact for firms in Latin America and Sub-Saharan Africa. Furthermore, for Transition countries, corruption is the most important determinant of investment.

From the empirical literature reviewed, it is obvious that there are no studies specifically on the relationship between industrial sector growth, institutional quality (corruption) and macroeconomic performance of SSA. The study of Asiedu and Freeman (2009); Omotesho and Mobolaji (2014) which are the closest did not focus on industrial sector growth. The only study that investigated the industrial growth was based on Zimbabwe and did not consider the influence of macroeconomic variables. This study will contribute to filling these identified gaps.

## 3. Methodology

This aspect of the paper discusses the research methods in terms of the theoretical underpinnings, model specification, estimating techniques as well as the sources of data.

### Model specification

(Romer, 1988) in his modification of Arrow's seminar work on the economies of learning by doing pointed out that investment in knowledge (experience) has strong linkage with increase in productivity. According to (Romer, 1988), the indexes of experience by cumulative investment follow the following production function.

$$Y_{it} = F(K_{it}, A(t)L_{it}) \ldots \quad (1)$$

Where $Y_{it}$ is the output of firm i , A(t) is the stock of knowledge of firm i at period t, $K_{it}$ and $L_{it}$ are the capital and labour of the firm at period t. Romer pointed out that labour is more productive due to accumulation of knowledge which also depends on experience. However experience is a function of past investment. Consequently the growth rate of output of the firm can be written as a function of indexes of experience by cumulative investment as follows:

$$G(t) = \int_{-\infty}^{t} I(v)dv = k(t). \quad (2)$$

Where G (t) is the growth rate of the output of the firm, I (v) dv is the indexes of the cumulative investment which is equal to capital stock k (t).

Again, in the definition of money demand function using the ISLM model, Romer(1996) postulated a relationship between some macroeconomic variables such as inflation, money growth and interest rate as follows;

$$\frac{M}{P} = L(r, y). \quad (3)$$

This can be written in linear form thus:

$$y = 1/\alpha\left(\frac{M}{P}\right) + \alpha/\beta(r). \quad (4)$$

Where $1/\alpha$ and $\alpha/\beta$ are elasticities of macroeconomic variables respectively.

Substituting equation 3 into 4 leads to:

$$G(t) = 1/\alpha \left(\frac{M}{P}\right) + \alpha/\beta(r)..$$ (5)

Thus, the growth rate of a firm can be presented as a function of these macroeconomic variables

Our model is a modification of equation 5. In our attempt to study the relationship between industrial sector growth, corruption and other macroeconomic variables in SSA, variables such as control of corruption and other macroeconomic variables such as inflation rate, exchange rate, economic growth and unemployment rate are included independent variables while industrial sector growth in the SSA is the dependent variable.

More explicitly the model is expressed thus

$$INDGR_{i,t} = \beta GDPGR_{i,t} + \infty UMP_{i,t} + \propto EXR_{i,t} + \delta INF_{i,t} + \sigma CORR_{i,t} + \varepsilon_{i,t}$$ (6)

Where INDGR is the growth rate of industrial sector for country i at time *t*. GDPGR is the economic growth for country i at time *t*. UMP is the unemployment rate for country i at time *t*. EXR is the exchange rate for country i at time *t*. INF is inflation for country i at time *t*. CORR is control of corruption for country i at time *t* and $\mu_{i,t}$ represents stochastic variable.

**Method of analysis**

**Panel-ARDL ( Auto-regressive Distributed Lags)**

The estimating techniques embraced for the study is the Auto-Regressive Distributed Lags in Panel form. This approach is selected because of its less stringent conditions in terms of stationarity test, which allows for variables that are integration of order zero. Again, it will enable us split the effects of these independent variables on the industrial sector growth to both long run and short run effects hence we will able to examine if the effect of macroeconomic performance of the SSA as well as their control of corruption have sustainable effects of the growth of the industrial sector.

The Panel-ARDL is utilized accommodates both the I(0) and I(1) variables whereas, error correction based panel cointegration only accommodates I(1) variables. The ARDL model is appropriate to run the short-run and long-run relationships (**Baltagi, 1995)**.

**Sources of data**

Data required for the study are sourced form secondary sources. Precisely, the Global Economic World Bank data remains an important source through which data on all the variables used for the study are sourced.

## 4. Results and discussion

This aspect of the research work presents and discusses the results from all the analysis explained in the methodology. According to the methodology, the model to be estimated is mainly on the effects of macroeconomic performances and corruption on the growth of the industrial sector in the Sub Sahara Africa countries SSA.

**Panel Unit Root Test for the SSA**

Ascertaining the order of integration of the variables used in the panel model is very germane to the selection of the estimating technique to be used for our analysis. Therefore, the usual practice is to use more than one method of panel unit root test to be able to confirm the level of consistency in the panel unit root test (Maddala Kim, 1998). In this study, the Im Peresan and Shin (2003), IPS, and the Augmented Dickey Fuller, ADF tests are used for the panel unit root test. The results are presented in table I.

The results show that all the variables used in the analysis are integration of both order one and zero I(1) and I(0).

Based on the foregoing, Panel Auto-regressive Distributed Lag, ARDL which is another estimating technique that permits variables that are stationary at levels to be used in the analysis is employed. As explained in the methodology, Panel ARDL emphasizes that none of the variables should have order of integration greater than one, in other words both variables that are I(1) and I(0) are acceptable.

**Table 1. Panel Unit Root Test for the SSA**

| | IPS unit root test | | ADF-Fisher Chi-square unit root test | |
|---|---|---|---|---|
| Variables | t* Statistics | Order of integration | t* Statistics | Order of integration |
| CORR | 2.03749** | I(0) | 315.585*** | I(1) |
| EXR | 1.84323** | I(1) | 171.007*** | I(1) |
| ECGR | 2.08218*** | I(1) | 177.357*** | I(1) |
| INDGR | INDGR *** | I(1) | 84.7924*** | I(1) |
| INF | 4.79503*** | I(0) | 103.123** | I(0) |
| UEMP | 5.59182*** | I(1) | 117.160*** | I(1) |

Statistical significance at 1%(***), 5%(**), 10%(*)
Source: Authors' computation

**Panel ARDL for the SSA**

Estimating Panel ARDL require three steps; first is the assessment of panel cointegration and the second one is the Panel ARDL model estimation.

**Panel cointegration test**

The panel cointegration test is to confirm or reject the hypothesis that there is long run relationship among industrial sector growth, macroeconomic performance and corruption in the SSA.

As stated in the above table, applying the Pedroni residual cointegration under the trend assumption: shows that, out of the eleven probability outcomes, nine of the probability outcomes result show that they are significant at 5% which implies that there exist a long run relationship among the variables examined.

**Table 2. Pedroni Residual Cointegration Test**

| Pedroni Residual Cointegration Test | | | | |
|---|---|---|---|---|
| Alternative hypothesis: common AR coefs. (within-dimension) | | | | |
| | | | Weighted | |
| | Statistic | Prob. | Statistic | Prob. |
| Panel v-Statistic | 1.397034 | **0.0812** | 0.982919 | **0.1628** |
| Panel rho-Statistic | -1.882326 | **0.0299** | -1.828705 | **0.0337** |
| Panel PP-Statistic | -4.303880 | **0.0000** | -4.855980 | **0.0000** |
| Panel ADF-Statistic | -4.219383 | **0.0000** | -4.795135 | **0.0000** |
| Alternative hypothesis: individual AR coefs. (between-dimension) | | | | |
| | Statistic | Prob. | | |
| Group rho-Statistic | -1.693827 | **0.0451** | | |
| Group PP-Statistic | -5.459773 | **0.0000** | | |
| Group ADF-Statistic | -5.830899 | **0.0000** | | |

Source: Author's Computation

**Panel ARDL estimation**

After the confirmation of cointegration the Panel ARDL regression is next. This is where the relationships among the variables is analyzed. The ARDL method breaks the relationship into both long run and short run relationships. The results are presented in tables 3 and 4 for long and short run relationships respectively.

**Table 3. ARDL regression, Long run relationship**

| Selected Model: ARDL(2, 2, 2, 2, 2, 2) | | | | |
|---|---|---|---|---|
| Variable | Coefficient | Std. Error | t-Statistic | Prob.* |
| | Long Run Equation | | | |
| GDPGR | 5.027474 | 0.663370 | 7.578685 | 0.0000 |
| UMP | -17.76855 | 1.600396 | -11.10260 | 0.0000 |
| EXR | 0.300928 | 0.034213 | 8.795669 | 0.0000 |
| INF | -7.000964 | 0.839623 | -8.338227 | 0.0000 |
| CORR | 14.72507 | 6.596403 | 2.232288 | 0.0264 |

**Table 4. ARDL regression, Short run relationship**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. * |
|---|---|---|---|---|
| COINTEQ01 | -0.309947 | 0.001668 | -185.8538 | 0.0000 |
| D(INDGR(-1)) | -1.890648 | 0.031470 | -60.07813 | 0.0000 |
| D(GDPGR) | 1.143838 | 0.049050 | 23.32006 | 0.0002 |
| D(GDPGR(-1)) | 1.903286 | 0.043077 | 44.18323 | 0.0000 |
| D(UMP) | 11.85770 | 1.476852 | 8.029038 | 0.0040 |
| D(UMP(-1)) | 19.01727 | 3.145181 | 6.046479 | 0.0091 |
| D(EXR) | 0.129254 | 0.000130 | 995.5844 | 0.0000 |
| D(EXR(-1)) | -0.131741 | 0.000163 | -810.0594 | 0.0000 |
| D(INF) | -0.976225 | 0.010991 | -88.81950 | 0.0000 |
| D(CORR) | 14.49076 | 4.109147 | 3.526464 | 0.0387 |
| D(CORR(-1)) | 13.02973 | 2.451035 | 5.316012 | 0.0130 |
| C | -35.47479 | 10.64932 | -3.331179 | 0.0447 |

Tables 3 and 4 explain the long and short run relationships between industrial sector growth, macroeconomic performance and corruption in the SSA. The results show that both macroeconomic variables and corruption have significant impacts on industrial sector growth in the SSA. Macroeconomic performance is captured by unemployment rate, economic growth, inflation rate and exchange rate.

Firstly, the results show that there exist a positive relationship between economic growth and industrial sector growth in the SSA in both long run and short run period. The coefficients are 5.027474 and 1.143838 for both long and short run periods respectively. The implication of the result is that the rate of industrial sector growth in the SSA is significantly affected by the economic growth of the SSA countries both in the long and short run periods. Therefore as the economy of a country is growing the industrial sector is influenced positively and if the economic growth is falling also the industrial sector growth also falls. The result is similar to the findings of Makochekanwa (2014) where economic growth of Zimambwe had positive and significant impact of the industrial growth.

Secondly, unemployment rate coefficient is -17.76855 in the long run and it is significant. The implication is that there is an inverse relationship between unemployment rate and industrial sector growth in the long run. The implication is that a rise in unemployment rate will bring an fall in the industrial sector growth in the long run. However, the coefficient is 11.85770 that is positive and significant in the short run. This simply implies that industrial sectors may witness a rise in their growth despite a rise in the unemployment rate but this can only occur in the short run. Therefore to achieve a sustainable industrial sector growth which is shown by the long run equation, unemployment rate should be kept at the minimum. The result is similar to the findings of (Van Rijckeghem Weder, 2001) who concluded that unemployment creates social menace for the industrial growth.

Thirdly, the exchange rate coefficients in both the long and short run equation are 0.300928 and 0.129254 respectively. The results show that there exist a direct of positive relationship between industrial sector growth and the exchange rate of the SSA. The implication of the result is that currency devaluation will bring a significant rise in the industrial sector growth. The implication is that a rise in exchange rate which means depreciation of the currency will made import more expensive and thus encouraging export and promoting domestic production which will in turn lead to rise in the industrial sector growth. This is evident in some studies like (Rajan Subramanian, 2011), where Dutch disease is a manifestation of this kind of relationship between the industrial sector and the exchange rate

The coefficient of inflation is -7.000964 and -0.976225 in both long run and short run periods. This simply shows that there is an inverse relationship between industrial sector growth and inflation in the SSA. The implication is that a rise in inflation rate will bring a significant fall in the level of industrial sector growth in the SSA. The result conforms to the apriori expectation because, rise I inflation connotes a rise in the cost of production. Therefore if the cost of production is rising as a result of increase in the inflation rate, this will bring a significant decrease in the industrial sector growth of the SSA. This relationship was also confirmed by Loungani Sheets (1997(Loungani Sheets, 1997).

Lastly, corruption control is used as proxy for corruption. Positive or rising value shows good corruption control while falling all negative value shows otherwise. The results show that for both periods the coefficients of corruption

control are 14.72507 and 14.49076 respectively. Consequently, it indicates that a good control of corruption will bring about a rise in the industrial sector growth of the SSA. This is an indication that institutional quality is a major challenge to the industrial sector of the SSA. The higher quality the institution of the SSA is the larger growth that will be witnessed in the industrial sector. The study of (Zafar, 2007) is one of the studies in which the same relationship was obtained although it was a descriptive analysis.

The error correction term coefficient is -0.309947 and it is significant at 1%. The implication is that the estimated panel model of the SSA is a good one in that error in the past can be corrected at present with about 30% feedback. This is because the error correction term is rightly signed and will be able to resto the equilibrium whenever there is a disequilibrium is the level of industrial sector growth witnessed by adjusting the independent variables.

**Diagnostic test**

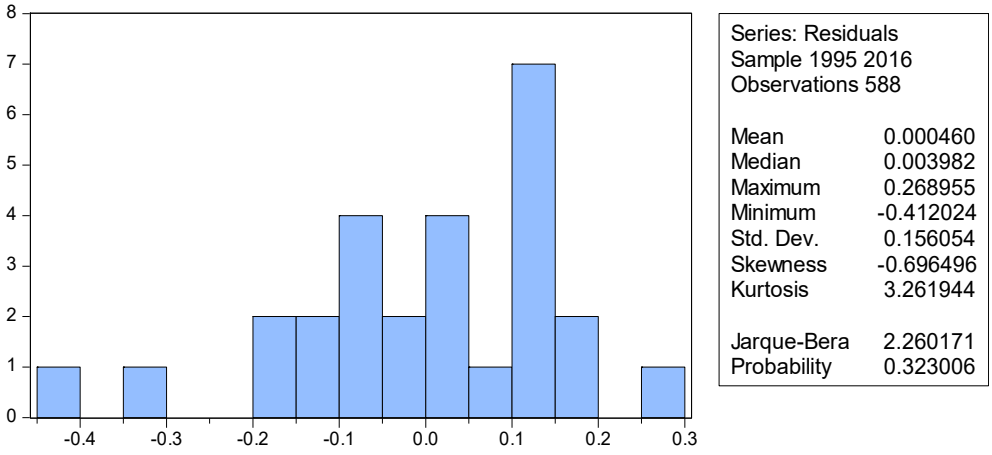
Some test are carried out to verify the reliability if the parameter estimates obtained in the estimated panel model for the SSA.

**Table 5. Model selection Croteria**

| Model Selection Criteria Table | | | | | |
|---|---|---|---|---|---|
| Model | LogL | AIC* | BIC | HQ | Specification |
| 4 | -794.695794 | 4.056056 | 6.691461 | 5.085114 | ARDL(2, 2, 2, 2, 2, 2) |
| 2 | -1002.348660 | 4.697674 | 7.116681 | 5.642234 | ARDL(1, 2, 2, 2, 2, 2) |
| 1 | -1277.730161 | 5.281179 | 6.834599 | 5.887750 | ARDL(1, 1, 1, 1, 1, 1) |
| 3 | -1272.897337 | 5.363919 | 7.133736 | 6.054987 | ARDL(2, 1, 1, 1, 1, 1) |

The result on table 5 shows that the best model with the highest log likelihood value as selected via the AIC criteria is selected for the estimation. Therefore ARDL(2, 2, 2, 2, 2, 2) is the best model selected for the analysis.

**Figure 1. Normality test**



Another diagnostic test carried out is the normality test. The result show that the JARQUE_BERA statistics value of 2.260171 is not significant at 5% therefore the hypothesis that the estimated model residual is not normally distributed is rejected. Therefore we conclude that the model estimated for the relationship between industrial sector growth, macroeconomic performance and corruption in the SSA has a residual that conforms to normal distribution hence the result is reliable

**Conclusions and recommendations**

Findings from the study have led to some germane conclusions about the relationship between industrial sector growth, macroeconomic performance and corruption in the SSA.

Firstly, it can be concluded from the findings that economic growth of countries in SSA is very important to the growth of their industrial sectors. Countries with stunted economic growth will definitely witnessed poor industrial growth. Again, currency devaluation has been shown as a way of promoting the industrial sector growth in the SSA. This conclusion conforms to the findings from the studies of Omoteso and Mobolaji (2014). However, this comes with some caveats like inflation rate must be kept at bay so that high cost of production will not leads to rise in the domestic goods prices which can further encourage importation.

Secondly, rising unemployment rate has been shown from the study as inimical to the growth of the industrial sector. Notwithstanding, findings from the study indicate that this may be positive in the short run as industries might be able to cut cost as a result of reduction in workers which will aggravate unemployment rate but this situation will not lead to a sustained industrial growth rate as shown by the result. It is concluded from the study that a sustainable industrial growth increase can be guaranteed via reduction in the level of unemployment rate. Again, as part of the conclusion from the study it was found out that the industrial sector of an economy depends of the growth of the economy. This explains the reason why industrial sector of developed economies are strong and developed.

Finally, the study has shown that poor institutional quality will also inhibit industrial growth. This finding is similar to (Omoteso Ishola Mobolaji, 2014). Poor handling of corruption by institutors in the SSA has been shown t have a significant negative impact of the growth of the industrial sector. It is recommended that institutions in SSA should embrace policies that will ensure importation is discouraged through exchange rate policy, keeping minimum levels of inflation and unemployment rate couple with effective control of corruption in order to ensure sustainable industrial growth in the sub region.

However, the study limitation is in the area of the panel data analysis it is believed that individual assessment of each country in the SSA can offer more insight into what individual country is presenting in terms of the relationship between their industrial sector and corruption. This is called a disaggregated approach. Consequently further studies on this topic can consider using disaggregated approach and examine if there will be some differences in their results.

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