

The table above shows that RGDP (real gross domestic product), MAN (manufacturing output), INTR (Interest rate) and K (loan to manufacturing firms) among all the variables is stationary at level 1(0) i.e. ADF test -statistics is more than the critical value at 5% level of significant in absolute term. This means that INTR does not have unit root problem. While at the first difference 1(1) the ADF test- statistics was greater that the critical value of 5% for the following variables; INFL (Inflation), EH (expenditure on health), EDU (expenditure on education), L (secondary school enrolment) and EXC (Exchange rate). This means that the existence of unit root problem has been removed.

Cointegration Results: The study also performed co-integration test in order to establish whether long-run relationship exist between the dependent and independent variables in the model by employing Johansen co-integration test.

Table2: Unrestricted Cointegration Rank Test (Trace) and (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	0.05 C.V	Prob.**	Hypothesized No. of CE(s)	Max-Eigen Stat	0.05 C.V	Prob.**
None *	0.909861	362.7905	197.3709	0.0000	None *	86.63031	58.43354	0.0000
At most 1 *	0.865498	276.1602	159.5297	0.0000	At most 1 *	72.22236	52.36261	0.0002
At most 2 *	0.835614	203.9379	125.6154	0.0000	At most 2 *	64.99929	46.23142	0.0002
At most 3 *	0.670883	138.9386	95.75366	0.0000	At most 3	40.00831	40.07757	0.0509
At most 4 *	0.650299	98.93025	69.81889	0.0001	At most 4 *	37.82437	33.87687	0.0160
At most 5 *	0.530736	61.10588	47.85613	0.0018	At most 5	27.23721	27.58434	0.0553
At most 6 *	0.484870	33.86866	29.79707	0.0161	At most 6 *	23.88007	21.13162	0.0200
At most 7	0.229268	9.988591	15.49471	0.2816	At most 7	9.374938	14.26460	0.2563
At most 8	0.016901	0.613653	3.841466	0.4334	At most 8	0.613653	3.841466	0.4334

Source: Researcher Computation, 2018.

From the table above, the study concluded that there is a long run relationship between the dependent and independent variables in the model since the test indicate 6 co-integrating equation at 5% level of significance as shown by the asterisks (*) for unrestricted cointegration rank test. While, maximum eigenvalue test indicated 5 co-integrating equations at 5% level of significance as shown by the asterisks (*). Hence, the study rejects the null hypothesis that indicated no long-run relationship or no cointegration among the variables adopted in this study. This means that there is an existence of long-run association between that variables adopted for this study. Due to the co-integrating equations this study adopted the vector error correction model (VECM) instead of VAR.

Test for Spurious Regression:

The study also tests for spurious regression in which a residual unit root test is performed. The criteria for admitting the presence of spurious regression using a residual unit root test is that, the residual will be stationary at first difference 1(0) and the Enger-Granger critical value will be greater than the t-statistics value.

Table 4: Unit Root Residual Test:

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	4.952883	0.0004
Test critical values:		
1% level	-3.689194	
5% level	-2.971853	
10% level	-2.625121	

From the residual unit root test result above, it showed that the unit root result is stationary at level. Using the Enger-Granger critical value of 10% which is -3.04 , it shows that the test statistics of 4.952883 is greater than the Enger-Granger critical value of -3.04 (absolute value). Hence, we reject the null hypothesis and accept alternative hypothesis that residual (U) does not have unit root. This implies that our estimated regression result is not spurious.

Test for Serial Correlation

The study also conducted a test to check if the residual of the variables are not serial correlated. Breusch-Godfrey Correlation LM Test was used to check for the existence of serial correlation.

Table 5: Breusch-Godfrey Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.666735	Prob. F(2,24)	0.2100
Observed R square	3.659	Prob.	0.016

From the above table, the F-statistic of 1.666735 confirmed that the existence of long-run relationship among the variables in the study. The Pesaran et al., 2001 table of tabulated F-table showed that the F-statistics value of 1.666735 with intercept and no trend the Observed R^2 value is 3.659 and the p-value is 16%. This means that Observed R^2 value is not significant; hence, we accept the Null Hypothesis (H_0) and reject the Alternative Hypothesis (H_1) that state that the model is serial correlated. We conclude that the model is not serially correlated.

The study carried out a Normality Distributed test on the adopted variables. The result is presented below

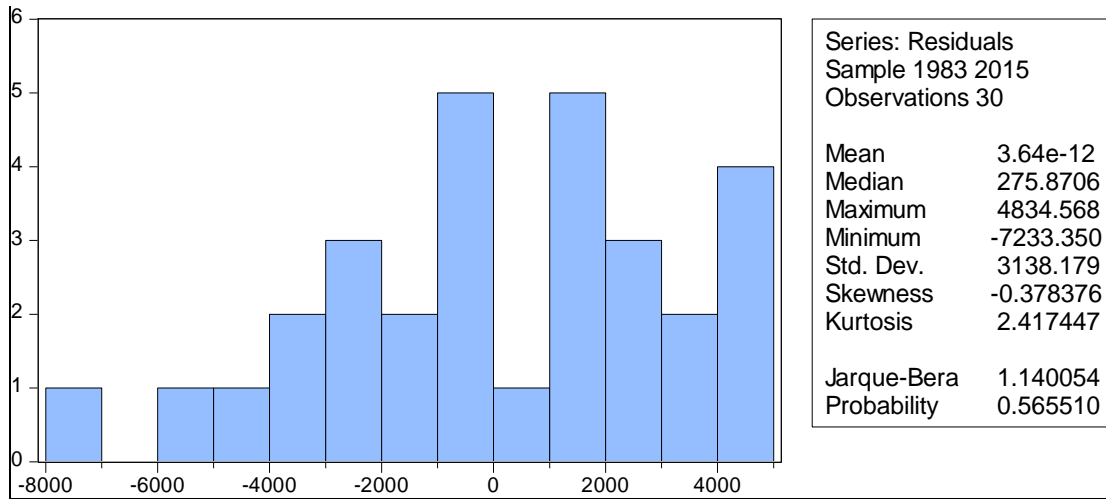


Figure 1: Normal Distributed Test

From the result above, the Jarque-Bera is 1.140054 which is not significant. Hence, we conclude that the residual is not normally distributed.

ECM Regression Result:

Due to the result of the cointegration test earlier carried out and the findings indicated presence of cointegration of the variable this pre-empted the use of VECM instead of VAR. VECM result is presented in the Appendix. While, the ECM equation of the result is presented below

The ECM equations regression is presented in the table below

Table 6: Estimates of Error Correction Model (ECM)

VARIABLES	Coefficient	Std. Error	t-Statistic	Prob.
ECM	-1.424376	0.167094	-8.524419	0.0000***
RGDP	-0.419168	0.182802	-2.293014	0.0323**
EDU(1)	-1.30E-10	2.23E-10	-0.582569	0.5664
EDU(2)	1.17E-09	4.76E-10	2.456397	0.0228**
EH(2)	-1.31E-09	6.71E-10	-1.953167	0.0643*
INF(2)	-0.000471	0.000399	-1.180575	0.2510
INTR(1)	-0.000383	0.000431	-0.888206	0.3845
L(1)	0.038647	0.024328	1.588606	0.1271
L(2)	-0.052917	0.023694	-2.233394	0.0365**
K(1)	-4.06E-11	7.43E-12	-5.461285	0.0000**
MAN(1)	0.003526	0.005098	0.691637	0.4967
EXC(1)	-0.000119	0.000508	-0.235279	0.8163
CONSTANT	-0.017306	0.425676	-0.040656	0.9680
R-squared	0.997424	Mean dependent var	10.25173	
Adjusted R-squared	0.995951	S.D. dependent var	0.524531	

S.E. of regression	0.033375	Akaike info criterion	-3.679160
Sum squared resid	0.023391	Schwarz criterion	-3.095552
Log likelihood	75.54572	Hannan-Quinn criter.	-3.480133
F-statistic	677.5112	Durbin-Watson stat	1.952085
Prob(F-statistic)	0.000000		

From the table, the error correction term (ECT) is 1.14244 and it is correctly signed. It means that error correction term actually corrects the disequilibrium of the system. The speed of adjustment to equilibrium is at 114.244% and it is significant. The error correction term also validate that there exists a long run relationship among the variables used in the model. The negative sign showed that the error correction regression is not a spurious regression based on the adopted model for this study.

The short run coefficients indicated that individual effect of the explanatory variables on the dependent variable (RGDPD). RGDP (2) which is lag 2 of RGDP, EH (2) which is lag 2 of EH, LAB(2) which lag 2 of L and K(1) which is lag 1 of LOMA all had negative effect of RGDP in the short run and it is significant at both 5% and 1% levels respectively. While, EDU (2) which is lag 2 of EDU had positive effect on RGDP in the short run and it is significant at 5% level. This means that an increase in any of these variables will lead to a decrease or increase in RGDPD (economic growth) in the short run in Nigeria.

Table 7: The Causality Test: The Granger causality test is presented in the table below;

Null Hypothesis	Obs.	F-Stat.	Prob	Remark
EH does not Granger Cause EDU	33	3.90695	0.0319	Uni-directional
EDU does not Granger Cause EH		1.21647	0.3115	
K does not Granger Cause EDU	33	19.0397	6.E-06	Bi-directional
EDU does not Granger Cause K		7.39006	0.0026	
RGDP does not Granger Cause EDU	33	4.62258	0.0184	Uni-directional
EDU does not Granger Cause RGDP		0.22059	0.8034	
EXC does not Granger Cause EH	36	2.88613	0.0709	Uni-directional
EH does not Granger Cause EXC		0.20739	0.8138	
K does not Granger Cause EH	36	16.2680	1.E-05	Bi-directional
EH does not Granger Cause K		23.9604	5.E-07	
RGDP does not Granger Cause EH	36	2.83832	0.0738	Bi-directional
EH does not Granger Cause RGDP		4.46411	0.0198	
INTR does not Granger Cause EXC	36	2.49691	0.0988	Bi-directional
EXC does not Granger Cause INTR		3.30347	0.0501	
K does not Granger Cause EXC	36	1.72430	0.1950	Uni-directional
EXC does not Granger Cause K		6.30765	0.0050	
RGDP does not Granger Cause EXC	36	0.40119	0.6729	Uni-directional
EXC does not Granger Cause RGDP		3.95781	0.0295	
INTR does not Granger Cause INF	36	0.19373	0.8249	Uni-directional
INF does not Granger Cause INTR		2.83244	0.0742	
L does not Granger Cause INF	36	2.55009	0.0943	Uni-directional
INF does not Granger Cause L		2.30900	0.1162	
LEDU does not Granger Cause INF	33	1.85622	0.1750	Uni-directional
INF does not Granger Cause LEDU		4.43838	0.0212	

RGDP does not Granger Cause L L does not Granger Cause RGDP	36	0.04792 6.89969	0.9533 0.0033	Uni-directional
MAN does not Granger Cause LEDU LEDU does not Granger Cause MAN	33	0.32138 4.11832	0.7278 0.0270	Uni-directional
RGDP does not Granger Cause K K does not Granger Cause RGDP	36	5.76188 12.8427	0.0075 9.E-05	Bi-directional
RGDP does not Granger Cause MAN MAN does not Granger Cause RGDP	36	3.88238 0.35714	0.0313 0.7025	Uni-directional

Author's Computation, 2018

The table above shows the causal relationship between RGDP (real gross domestic product), INFL (inflation), MAN (manufacturing output), INTR (interest rate), EXC (exchange rate), EH (expenditure of health), EDU (expenditure on education), K (loan to manufacturing) and L (Secondary School Enrolment) in Nigeria during the period of 1980 to 2017.

The result revealed that a significant uni-directional relationship exists among the variables adopted. For example, uni-directional causality showed that; EH is granger causing EDU, RGDP is granger causing EDU, EXC is granger causing EH, EXC is granger causing K, EXC is granger causing RGDP, INF is granger causing INTR, L is granger causing INF, INF is granger causing LEDU, L is granger causing RGDP, LEDU is granger causing MAN and RGDP is granger causing MAN.

Similarly, significant bi-directional relationship exists among the adopted variables. This means that variables influence one another. Such that; K and EH granger cause one another, RGDP and EH granger cause one another; INTR and EXC granger cause one another, RGDP and K granger cause one another. Interestingly, this study does not found any relationship between inflation (INFL) and economic growth (RGDP) of inflation and manufacturing output (MAN). However, the study established the existence of significant relationship between manufacturing output and economic growth. This implies that as manufacturing activities tend to increase in Nigeria, it stimulates the growth of the economy.

4. SUMMARY, CONCLUSION AND RECOMMENDATION

The paper examined nexus among inflation, manufacturing output and economic growth. Data from 1980 to 2017 was adopted and pre-test and post-test was performed. The paper performed unit root stationarity test and cointegration test. Variables such as; RGDP (economic growth), MAN (manufacturing output), INTR (interest rate) and K (loan to manufacturing firms) were stationary at level, while INFL (inflation), EXC (exchange rate), EH (expenditure on health) EDU (expenditure on education and L (secondary school enrolment) were stationary at first difference. The Johansen Cointegration test confirmed that the adopted variables cointegrated.

The study performed spurious regression and serial correlation tests and it was confirmed that the spurious relationship and serial correlation do not exist among the adopted variables for this study. The ECM (Error Correction Model) Regression, showed that the ECT is correctly signed. The result of the error correction model shows

that there is inverse relationship between inflation and GDP in one and direct relationship between manufacturing output and economic growth. This is also in conformity with the study stated a priori expectation. However, this relationship is not significant. Hence, the paper concluded that inflation and manufacturing output is not a key factor stimulating economic growth in Nigeria.

The Enger Granger Causality test indicated that no causal relationship existed between inflation and economic growth or economic growth to inflation. However, causal relationship existed between manufacturing out and economic growth. This implies that as manufacturing productivity increases, it tends to increase economic growth in Nigeria in the year under study.

With respect to the outcome of this study, the paper recommended that inflationary rate must be monitored and curtailed to a single digit so that growth can be sustained, diversification of the economy to enhance the performance of the manufacturing sector activities in Nigeria.

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