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The Effect of Banks' Credits on the Development of Manufacturing and Agricultural Sectors of Nigeria's Economy

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Abstract

The study examined the effect of banks' credit on agricultural and manufacturing outputs on the Nigerian economy. It covers the periods of thirty-one (31)1years (1984-2014). The study employs annual time series data covering the period 1984 -2014. Data for the study was obtained from Central Bank of Nigeria's (CBN) Statistical Bulletin and CBN Annual Report and Nigeria Bureau of Statistics (NBS), In carrying out the analysis, manufacturing, and agricultural outputs are function of commercial banks' credits to private sector, interest rate, prime lending rate, money supply ,exchange rate, prime lending rate and agriculture credit guarantee scheme fund. The data collected were analysed using Vector Auto-regressive models. The following tests were conducted: Unit root test; Co-integration test; Vector error correction test; and Causality test and they used to evaluate the relationship between dependent variables of agricultural output and manufacturing output as the share of Gross Domestic Product. E- Views 8 were used to analyse the data and results obtained accordingly. It was found out that banks' credits have the significant impact on the agricultural and manufacturing sector in Nigeria. The study recommended that Government should allocate more funds to the real sector of the economy sector to boost their contributions to the ailing GDP in Nigeria and to reduce unemployment

Keywords:
Banks' credits, Agricultural and manufacturing sector, Agricultural credit, Guarantee Scheme fund, Economic growth.

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Background to the Study

Financial institutions play important role in the provision of the financial support to the real sector in an economy, such as Nigeria. As financial institutions, banks perform intermediation roles generally by mobilizing resources from the surplus units and channeling same to the deficit units for productive activities within an economy. The Deposit Money Banks through their credit policy act as lubricants and promote growth in different sectors of the economy, paying attention to the priority sectors of the economy.

Rapid and Sustained growth of the domestic economy of Nigeria has since the political independence in 1960 been of paramount importance to successive governments in the country , consequently , governments have since implemented several National development plans and programmes , aimed at boosting productivity , as well as diversifying the domestic economic base. The required resources have been very scarce this has necessitated the need for quick intervention of commercial banks' credits.

Manufacturing activities have a significant impact on the economy of a nation. In developed economies, for instance, they account for a substantial proportion of total economic activities, in Nigeria, and the subsector is responsible for about 10% of total GDP annually. In terms of employment generation, manufacturing activities account for about 12% of the total force in the formal sector of the nation economy performance .Activities in the manufacturing sector cover a broad spectrum ranging from light agro-based industries to heavy iron and the steel companies. In an advanced economy, the manufacturing sector is a leading sector in a different aspect; it is an avenue of increasing the productivity related to import replacement and expansion, creating foreign exchange earnings and per capital income, which causes unique consumptions patterns (Anyanwu, 2000). However , the effectiveness of manufacturing companies is dependence on the availability of resources , such as raw materials and financial availability to meet up with the demands, this bring about the needs of the financial sector in Nigeria by allocating a substantial amount in developing the subsector of the economy.

Adediran and Obasan 2010 have argued that in the advanced and developing countries productivity growth trend to be higher in agriculture than manufacturing, but in terms of output growth manufacturing continues to perform better than agriculture. Responding to the these sectors, the federal government of Nigeria prioritized the agriculture and manufacturing sector, directed commercial banks through Central Bank of Nigeria, to devote a certain percentage of their loanable funds to these sector, hence to encourage commercial banks to meet their target, the Central Bank of Nigeria introduced the Agricultural Credit Guarantee Scheme (ACGS) in 1979 to guarantee credits being disbursed to farmers.

Central Bank of Nigeria (CBN) with the sole aim of channeling credits to the preferred sectors, like agriculture and manufacturing. With the liberalization of the economy and the abolition of mandatory sectoral allocation of credit in 2000, the market-determined interest rates influenced the credit allocation to the real sector of the economy.

Banks in Nigeria are highly liquid, but they try to shun lending to the agriculture and manufacturing sectors, because they believe it could be detriment to their business aimed, which is profit oriented, This brings about a low credits and a high interest rate spread on loan being given to them, thereby limiting the efficiency of the sectors.

The main objectives of the study are to examine and analyze the effect of banks' credits on the development of agricultural and manufacturing sectors in Nigeria, which covers the period of 30years. The findings of this study would be of benefit to policy makers and to the prospective researchers that will serve as the bedrock for achieving the stated aimed of their research work

Nwanyanwu (2011) identified banks' traditional roles to include, financing of agriculture, manufacturing, and syndicating of credits to productive sectors of the economy. In order to ensure proper distribution of banks' credits, the Nigerian economy was divided into two, the priority and non-priority sectors and a certain percentage of banks 'credits were expected to be allocated to these sectors, as directed by the Central Bank of Nigeria's (CBN) circular 27 of 1993 (Ekezie, 2006). Adediran and Obasan (2010) had observed that the manufacturing sector contributes to a nation's economic development, as it increases the chances of industrialization. Anyanwu (2000) pointed out that low level of investments has constrained productivity in Nigeria. The poor investments have been traced largely to banks' unwillingness to make credits available to manufacturers, owing partly to the mismatch between the short-term nature of commercial banks' funds and the medium to long-term nature of funds needed by industries.

Issues with the Manufacturing Sectors in Nigeria

The foreign exchange restrictions placed on forty one (41) items by Central Bank of Nigeria has affected the operations in the various sectors of the economy. It was recorded that fifty (50) of manufacturing companies had closed up for business due to the restriction order. These have led to loss of the job in the industries and increased the staggering rate of unemployment. The non-availability of production inputs, high interest rates on credit facilities available to the sectors, poor power-supply, policy inconsistency, poor patronage of locally manufactured products, poor supporting infrastructures, among others are the challenges confronting manufacturers. Over the decades, there has been near collapse of infrastructure, the development has been bad in the country that most businesses groan under the intense pressure due to high overhead cost incurred in providing alternative infrastructure.

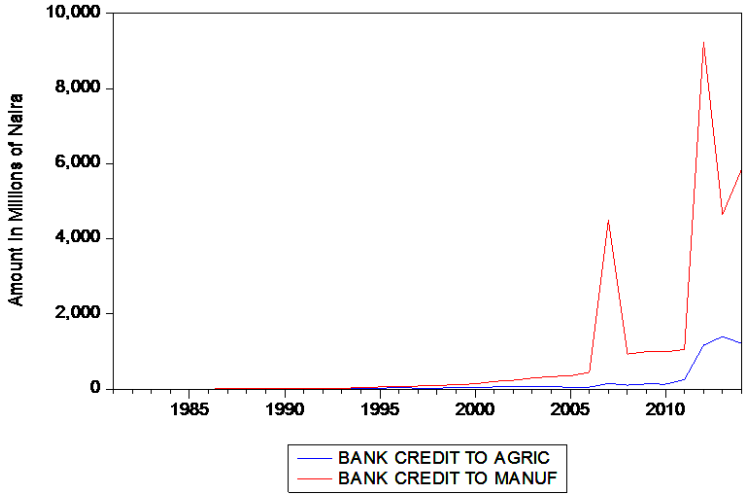
The inadequate infrastructure and the devaluation of naira have further shrunk down capacity utilization and have lead to high cost of production. Due to these factors, the domestic economy witnessed an unprecedented closure of factories and production plants, this assertion of weakening economy, more sectors were being affected by the recession and the profile of unemployment kept rising.

Challenges Facing Agricultural Sector in Nigeria

Nigeria is predominantly still an agrarian society. Approximately 70 percent of the population engages in agricultural production at a subsistence level. The decline in agricultural production in Nigeria began with advent of the petroleum boom in the early 1970s, the

inconsistencies of government policies, have turned to agriculture, unattractive. The inadequate technology for the use of farmers to produce at large quantity in order to meet local consumption and foreign demands, arts of nature, such as drought, pest destroying the farm produce, poor transportation, weaken and absence of the infrastructure, and trade restrictions contributed to the major decline in agricultural output. As Nigeria population increases, food production could not keep pace with its increasing population, these have resulted in an increase in the level of imported foods and importation bills. The government often imports a large number of machinery without a single service station for repairs and the replacement worn out parts.

Graph: 1
Banks' credits to the Agricultural and Manufacturing sectors for the periods- 1981 – 2014



Source: Central Bank of Nigeria's Statistical Bulletins

The above graph: 1 depicted the Banks' credits extended to the Agricultural and Manufacturing sectors, for the periods, 1981 to 2014. From the graph, it showed the upwards trends of these facilities granted to these sectors. In 1981, the Banks' credits provided to the manufacturing sector, was paltry N2.7B, rising to N7.4B in 1990. For the same period, the banks' credits to the Agricultural sector were N0.6B and N4.2B, respectively. There was astrological swing 1991from N10.9 to N141.3, in 2000. Agricultural sector recorded N5.0B to N41B for the same periods.

In the periods, from 2001 to 2010 and 2014, the credits to manufacturing sector, moved from N206.9B, N987.6, and N5, 857.5B. The agricultural sector rose in the same periods, moving from N55.8B, N128.4B, and N1, 212.80B

The two sectors have enjoyed goodwill and credit supports from the banks and these credits have recorded increases in the periods under reviews.

In the theory of economic development, classical model propounded by Lewis (1954) he noted the agriculture as the basis for industrial growth and development. He posited that agriculture releases labour for industrial production and hence the engine of growth and development of any society must obviously start with agricultural production. In this sense, with heavy modernization and mechanization of agriculture, labour is free for industrial development

The loanable fund's theory was formulated in the 1930s by British economist, Dennis Robertson and Swedish economist, Bertil Ohlin, commonly used to explain interest rate movement suggests that the market interest rate determined by the factors that control the supply of and demand for loadable funds, the theory is especially useful for explaining movements in the general level of interest rates for a particular country. Furthermore , it can use along with other concepts to explain why interest rates on some debt securities of a given country vary, the phrase demand for loanable funds is widely used in financial markets to refer the borrowing activities of households, business, and government . The household, demands loanable funds to finance housing expenditures. In addition, they finance the purchase of automobiles and households items, which results in installments debt.

Credit is an important aspect of financial intermediation that provides funds to those economic entities that can put them into the most productive use. Theoretical studies have established the relationship that exists between financial intermediation and economic growth. Greenwood and Jovanovich (1990) observed that financial development can lead to rapid growth. In a related study, Bencivenga and Smith (1991) explained that development of banks and efficient financial intermediation contributes to economic growth by channeling savings to high productive activities and reduction of liquidity risks. They, therefore concluded that financial intermediation leads to growth.

Based on this assertion, this study examines the extent to which intermediation or credits to agricultural and manufacturing sectors of the economy have influenced economic growth in Nigeria. It means that a financial institution can effect economic growth by efficiently carrying out its functions, among which, is the provision of credits.

Empirical Studies

Akujuobi and Chima (2012) examined the impact of commercial Bank credit to the production sector on economic development in Nigeria for the period 1960-2008 using an ordinary least square technique. The commercial banks' credit to the following subsectors of the production sector - agriculture, forestry and fishery, manufacturing, mining and quarrying and real estate and construction were examined against the Gross Domestic Product. The finding of the study revealed that a long-run relationship exists between banks' credits to the production sector and economic growth. Also, the finding showed that, there was a high evidence of a bi-directional causal relationship between two of the explanatory variables and the Gross Domestic Product (GDP) with only the commercial banks' credit to the mining and quarrying sub-sector appearing to be a significant contributor at 1% significant level. Hence, the study concludes that, commercial Banks' lending to the production sector has not performed well in relation to contribution to economic growth.

Chinweoke, Egwu, and Nwabeke, (2015), investigated the impact of commercial banks loans and advances to the agricultural and manufacturing sectors on the economic growth in Nigeria for the periods, 1994 – 2013 using an ordinary least square technique, The result of the study shows that banks' loans and advances to agricultural and manufacturing sectors have a statistically significant impact on economic growth.

Uzomba, Chukwu, Jumbo and Nwankwo (2014) investigated the impact and the determinants of Deposit Money Banks' loans and advances granted to the agricultural sector in Nigeria from 1980 to 2011. Multiple OLS regression, Stationary Test, Co-integration test, Parsimonious Error Correction Mechanism and Granger Causality Test are employed. The study concludes that there is a positive impact of deposit money banks' loans and advances on the agricultural sector.

The study of Adeyinka, Daniel and Olukotun (2015) examined the contributions of commercial banks' credits in financing agricultural sector in Nigeria , secondary data from 2002-2014 on sectoral distribution of commercial banks' loans and advances to agricultural sector , liquidity ratio of commercial banks , cash reserve ratio of commercial banks and money market minimum rediscount rate . Data were analysed using multiple regression of ordinary least square to estimate the model, it was found out cash reserves ratio and rediscount rate is not statistically significant; and liquidity ratio is statistically insignificant; the study recommends that bank should provide a means of monitoring the end use of the loans given to farmers in order for them to manage the loans, effectively and efficiently.

The study of Toby and Peterside (2014) analyzed the role of banks in financing the agriculture and manufacturing sectors in Nigeria from 1981-2010. Agricultural contribution to GDP, manufacturing contribution to GDP, commercial banks' lending to agriculture, merchant banks' lending to agriculture, commercial banks' lending to manufacturing and merchant banks' lending to manufacturing were variables considered in the study, two levels of analysis were adopted in the study using descriptive analysis direct on the panel data 1 and 2 through multiple regression analysis. They found out that role of banks in facilitating the contribution of the agriculture and manufacturing sectors to economic growth is still limited. It was therefore, recommends that monetary policy instruments should emphasis mandatory sector allocation of credit with appropriate incentives to boost the flow of funds from the banks to the real sector.

Ogar, Nkamene and Effiong (2014) investigated the impact of commercial banks' loans, on manufacturing sectors. Secondary data, such as manufacturing output, commercial banks' loans, and commercial banks' interest rate were variables used under the study. Ordinary least square of multiple regressions was used on the models to determine the relationship between dependent variables and independent variables, their findings show that commercial banks' credits had a significant relationship with the manufacturing sector. It was recommended that government should endeavor to ensure that, there are available and sufficient credits allocations to the manufacturing sector in Nigeria and at the affordable interest rate. Sogules and Nkoro (2016) examined impact bank credits to agricultural and manufacturing sectors on economic growth. The used the Annual time series data from 1970-2013; employing Co-integration and Error Correction Mechanism (ERM) for the analysis. It

revealed that a long-run relationship exists between banks' credits to agricultural and manufacturing sectors and economic growth. Given the ERM results, the study showed that banks' credits to agricultural sector exhibited an insignificant negative impact on economic growth while banks' credits to manufacturing sector exhibited a negative significant impact on economic growth in Nigeria. The study recommends that banks' credits to the agricultural and manufacturing sectors should be properly monitored to ensure that funds meant for sectors are not diverted for other purposes, Intending recipients of these Bank credits to the agricultural and manufacturing sectors should be made to undergo entrepreneurial development training and how to pay back as at when due, so as to reduce the risks associated with giving out these credits to the Agricultural and Manufacturing Sectors entrepreneurs.

Based on the results of various studies conducted on the previous researchers on the topic, this study tend to bridge the gap by employing exchange rate and prime lending rate in the model adopted in the study, the study further improves on existing work of (Sogules and Nkoro, 2016; Ehikioya & Mohammed, 2013) who did not include exchange rate and prime lending rate in their models and also extended the scope of the study from 1984-2014.

Methodology

Source of Data

The data used for the purpose of this research were from secondary sources. The study employs annual time series data covering the period 1984 -2014. Data for the study was obtained from Central Bank of Nigeria's (CBN) Statistical Bulletin and CBN Annual Report and Nigeria Bureau of Statistics (NBS).

In carrying out the analysis, manufacturing, and agricultural outputs are function of commercial banks' credits to private sector, interest rate, prime lending rate, money supply, exchange rate, prime lending rate and Agriculture credit guarantee scheme fund.

Model Specifications

The data collected were analysed using Vector Auto-regressive models. The following tests were conducted: Unit root test; Co-integration test; Vector error correction test; and Causality test.

The mathematical specification for this study is as follows:

GDPM&A = f (BCTPS, INTR, PLR, MS, EXR, ACGSF) ---------- (1)

The mathematics model was transformed to general linear model of the study;

Econometrics Model:

$GDPM\&A = \beta_0 + \beta_1 BCTPS + \beta_2 INTR + \beta_3 PLR + \beta_4 MS + \beta_5 EXR + \beta_6 ACGSF + \mu$ -------- (2)

Where:

GDPA & M = Manufacturing Sector Output and Agricultural Sector Output

$\beta_{o=}$ intercept

BCTPS= Bank Credit to Private Sector

INT = Interest Rate
PLR = Prime lending rate
MS= Broad Money supply
EXR=Exchange rate
ACGSF=Agricultural Credit Scheme Guarantee Fund
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ = coefficients of the independent variables
μ = Error term or the residual

A single model was specified for the study, which includes a dependent, six independent variables and a stochastic error term that takes care of any variable not included or considered in the model.

The A-priori theoretical expectations for the models are as follows;
$B_1 > 0$ - Banks' credits to private sector (BCPS)
$B_2 > 0$ - Interest rate (INTR)
$B_3 > 0$ - Prime lending rate
$\beta_4 > 0$ - Broad money supply
$\beta 5 > 0$ - Exchange rate
$\beta_6 > 0$ - Agricultural Credit Scheme Guarantee Fund
All the independent variables have positive effect on economic growth

Unit Root Test
Macro and financial time series usually exhibit trending which would result in non-stationary of the data. However, autoregressive data must be transformed to stationary form before any meaningful analysis can be done. Augmented Dickey – Fuller unit root test is applied, to test for stationary of the variables employed in this study.

Co-Integration Test
Once it is established that the variables employ in this study are integrated of order 1(1) co-integration test is performed. A number of methods for testing co-integration have been proposed in the literature. The objective of this test is to establish if there is a long run relationship between the dependent variable, which is Manufacturing Sector Output and Agricultural Sector Output, and the independent variables, Banks' credits to Private Sector, Interest Rate, Prime lending rate, Broad money supply, Exchange rate and Agricultural Credit Scheme Guarantee Fund .This framework that is deployed, proposes two tests; the Trace (Δ trace) and the maximum Eigenvalue (Δ max) statistics.

Vector Error Correction Model (VECM)
VECM is applied once the co-integration test shown the existence of the long-run relationship among the variables of interest. The objective of VECM is to investigate the dynamic behavior of the model and describe how it is adjusting to each period towards its long-run equilibrium state. Once the variables are co-integrated in the short-run deviation from long-run equilibrium will feedback on changes in the dependent variables in order to force their movement towards long-run equilibrium state.

Causality Test

According to Gujarat and Porter (2009), although regression analysis deals with the dependence of one variable on other variables, it does not necessarily imply causation. This implies that, because there is a relationship between variables that does not prove causality or the direction of influence. Therefore, causality test would show the direction of causality between two variables and direction can be uni-directional, bi-directional or no direction. Granger causality model is used in this study.

Results and Discussion

Unit Root Test

The results of unit tests show that none of the variables was stationary at level 1(0) but ACGSF becomes stationary at first difference 1(1) while the other variables become stationary at second difference 1(2) as shown in table 1. Therefore, it is possible for these variables to co-integrate. Stationarity occurs when the absolute value of t statistic is greater than 5% critical value. Table:1 depicted the results of Augmented Dickey-Fuller test statistics indicating the 'T' statistics and 5% critical value. The Alternate Hypotheses are accepted when the P value is below 5%, meaning for each of the variables has no unit root and we rejected Null hypotheses, that the variable has a unit root.

Co-Integration Test

The results in table 2 show that both trace test and maximum Eigenvalue test reject the null to hypothesis of r = 0 because trace indicates that there is 1 co-integration likewise maximum Eigenvalue. The results of Trace test indicated two co-integrations at the 0.05 level while Max-Eigenvalue test indicates 1 co-integration Eqn(s) at the 0.05 level.

This is because theory suggests that co-integration exists, where there is at least one co-integration. Consequently, we can conclude that there is a unique long-run equilibrium relationship between Manufacturing Sector Output and Agricultural Sector Output, Banks' credits to Private Sector, Interest Rate, Prime lending rate, Broad money supply, Exchange rate and Agricultural Credit Scheme Guarantee Fund

Vector Error Correction Model

This result of the model as shown in table 3 is moderately low with 46.9891%, which is below the expectation of the minimum of 60%. The value of ECM is -0.527555, this means that both co-integrating equations were well behaved since they carried negative signs. This implies that if there are shor- run fluctuations, GDP will converge to its long-run equilibrium path at a speed of about 53%% in each period.

Causality Test

The results of the Granger causality test presented in table 4 below indicates uni-directional causality between: Agricultural Credit Scheme Guarantee Fund and Manufacturing Sector Output and Agricultural Sector Output ; Broad money supply and Agricultural Credit Scheme Guarantee Fund ; Manufacturing Sector Output and Agricultural Sector Output and Banks' credits to Private Sector

Conclusion

The objective of this is to determine the relationship between Manufacturing Sector Output and Agricultural Sector Output and Banks' Credits to Private Sector, which this study is broken into five components i.e. Interest rate, Prime lending rate, money supply, Exchange rate and Agriculture credits guarantee fund scheme. Three estimation techniques were used to determine the relationship between the dependent variable, Manufacturing Sector Output and Agricultural Sector Output and the six independent variables, which were used as proxy for Banks' Credits to Private Sector.

The result of co-integration test reveals that there is a long-run relationship between the variables employed in this study. The VECM result indicates that GDP will converge to its long-run equilibrium path at a speed of about 55% in each period. The result of causality test suggests that are only uni-direction causality from Agricultural Credit Scheme Guarantee Fund and Manufacturing Sector Output and Agricultural Sector Output; Broad money supply and Agricultural Credit Scheme Guarantee Fund; Manufacturing Sector Output and Agricultural Sector Output and Banks' credits to Private Sector

The conclusion that can be drawn from this is that Banks' Credits to Private Sector cause the growth of Manufacturing and Agricultural Sector Outputs of Nigeria's economy.

Recommendations

The following recommendations were made:

i Monetary authorities should endeavor to lower interest rate that will allow farmers to obtain commercial banks' loans at a reduced cost of funds.

ii The Government should strengthen Agricultural Credit Guarantee Scheme and more development programmes in order to monitor and grants more credits to the agricultural sector in Nigeria.

iii The Government should allocate more intervention funds to these sub-sectors of the real economy in order to boost their contribution to the ailing GDP of Nigeria and to reduce the rate unemployment in the Country.

iv The Government should pay more attention to infrastructure facilities, financial institutions, and various supply bottlenecks to guarantee smooth transforming of the agricultural sector in Nigeria through effective credit financing.

v The debate should focus less on whether or not there should be any industrial policy and more on making existing policy instruments more effective and crafting new policy instruments that take into account entrepreneurship ,the level of development of a country or region, and the changing relationship between state and private sector

vi Monetary policy should, therefore, emphasize mandatory sectoral allocation of bank credit with appropriate incentives to boost the flow of credit to the agricultural and manufacturing sectors. The government should put in place are evolving intervention fund to meet the long-term funding needs of the manufacturing sector which Deposit Money Banks (DMBs) are unwilling and unable to provide

vii Banks' credits to the agricultural and manufacturing sectors should be properly monitored by the institutions responsible for ensuring that funds are not misappropriated for other purposes, in order to boost economic growth. Recipients of

agricultural and manufacturing sectors banks' credits should be made to undergo entrepreneurial training before the credits are granted so as to reduce risks associated with giving out these credits for the economic growth

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APPENDICES

Table 2:

Null Hypothesis: D(ACGSF,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 1 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-13.29522	0.0000
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

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

Null Hypothesis: D(GDPMA) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on AIC, maxlag=7)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.779157	0.0037
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

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

Null Hypothesis: D(PLR,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 2 (Automatic - based on AIC, maxlag=7)

		t-Statistic	Prob.*

Augmented Dickey-Fuller test statistic		-5.886177	0.0003
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

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

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

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.399810	0.0001
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

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

Null Hypothesis: D(MS,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.590578	0.0000
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

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

Null Hypothesis: D(MS,2) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic - based on SIC, maxlag=2)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-8.590578	0.0000
Test critical values:	1% level	-4.323979	
	5% level	-3.580623	
	10% level	-3.225334	

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

Table 2:
Date: 11/20/16 Time: 00:59
Sample (adjusted): 1986 2014
Included observations: 29 after adjustments
Trend assumption: Linear deterministic trend
Series: ACGSF BCP EXCHRATE GDPMA INTR MS PLR
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.944219	182.9380	125.6154	0.0000
At most 1 *	0.697033	99.23473	95.75366	0.0282
At most 2	0.668437	64.60489	69.81889	0.1215
At most 3	0.398603	32.59074	47.85613	0.5795
At most 4	0.270965	17.84427	29.79707	0.5776
At most 5	0.254181	8.679302	15.49471	0.3959
At most 6	0.005996	0.174398	3.841466	0.6762

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.944219	83.70329	46.23142	0.0000
At most 1	0.697033	34.62984	40.07757	0.1809
At most 2	0.668437	32.01415	33.87687	0.0820
At most 3	0.398603	14.74648	27.58434	0.7680
At most 4	0.270965	9.164964	21.13162	0.8189
At most 5	0.254181	8.504904	14.26460	0.3297
At most 6	0.005996	0.174398	3.841466	0.6762

Max-eigenvalue test indicates 1 cointegratingeqn(s) at th e 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 3:

Vector Error Correction Estimates
Date: 11/20/16 Time: 01:22
Sample (adjusted): 1987 2014
Included observations: 28 after adjustments
Standard errors in ( ) & t-statistics in [ ]

CointegratingEq:	CointEq1
GDPMA(-1)	1.000000
ACGSF(-1)	-0.037602 (0.00793) [-4.74256]
BCP(-1)	146.8110 (10.8465) [13.5353]
MS(-1)	-123.2583 (11.2148) [-10.9907]
PLR(-1)	464.5080 (460.127) [1.00952]
C	53213.25

Error Correction:	D(GDPMA)	D(ACGSF)	D(BCP)	D(MS)	D(PLR)
CointEq1	-0.025690 (0.03746) [-0.68576]	-26.88207 (2.59902) [-10.3432]	-0.011992 (0.00453) [-2.64938]	-0.016505 (0.00400) [-4.12525]	5.46E-05 (4.8E-05) [1.13207]
D(GDPMA(-1))	-0.527555 (0.23079) [-2.28584]	31.09885 (16.0117) [1.94226]	0.014357 (0.02788) [0.51487]	0.009365 (0.02465) [0.37996]	-0.000595 (0.00030) [-2.00377]
D(GDPMA(-2))	-0.298938 (0.24403) [-1.22499]	10.39813 (16.9302) [0.61418]	0.030105 (0.02948) [1.02107]	0.020418 (0.02606) [0.78343]	-0.000443 (0.00031) [-1.41179]
D(ACGSF(-1))	-0.001024 (0.00247) [-0.41448]	-2.038450 (0.17135) [-11.8962]	-0.000947 (0.00030) [-3.17228]	-0.001116 (0.00026) [-4.23042]	3.15E-06 (3.2E-06) [0.99139]
D(ACGSF(-2))	-0.000276 (0.00246) [-0.11219]	-1.581638 (0.17049) [-9.27689]	-0.001327 (0.00030) [-4.46913]	-0.000921 (0.00026) [-3.50770]	2.16E-06 (3.2E-06) [0.68257]

D(BCP(-1))	2.442885	3393.794	1.317558	2.135693	-0.008001
	(5.89472)	(408.958)	(0.71220)	(0.62956)	(0.00759)
	[0.41442]	[8.29863]	[1.84999]	[3.39238]	[-1.05445]
D(BCP(-2))	3.148846	2863.491	-0.176766	1.254919	-0.004870
	(3.80492)	(263.974)	(0.45971)	(0.40637)	(0.00490)
	[0.82757]	[10.8476]	[-0.38452]	[3.08816]	[-0.99429]
D(MS(-1))	-4.479281	-3553.610	-1.070325	-2.375727	0.011664
	(7.86473)	(545.632)	(0.95021)	(0.83995)	(0.01012)
	[-0.56954]	[-6.51283]	[-1.12641]	[-2.82840]	[1.15215]
D(MS(-2))	-0.296141	-2993.748	1.253257	-0.603346	0.004805
	(4.97150)	(344.908)	(0.60065)	(0.53096)	(0.00640)
	[-0.05957]	[-8.67985]	[2.08649]	[-1.13634]	[0.75089]
D(PLR(-1))	30.52579	847.7500	7.014731	8.235994	-0.641359
	(180.438)	(12518.2)	(21.8003)	(19.2708)	(0.23225)
	[0.16918]	[0.06772]	[0.32177]	[0.42738]	[-2.76145]
D(PLR(-2))	97.28220	-3064.937	-5.887939	-6.301887	-0.218476
	(168.092)	(11661.7)	(20.3087)	(17.9522)	(0.21636)
	[0.57874]	[-0.26282]	[-0.28992]	[-0.35104]	[-1.00977]
C	2120.731	1648842.	649.6092	1017.658	-1.947178
	(2239.13)	(155344.)	(270.530)	(239.139)	(2.88215)
	[0.94712]	[10.6141]	[2.40124]	[4.25550]	[-0.67560]
R-squared	0.469891	0.961935	0.896755	0.874270	0.447151
Adj. R-squared	0.105440	0.935766	0.825774	0.787831	0.067067
Sum sq. resids	1.97E+08	9.50E+11	2880434.	2250756.	326.9339
S.E. equation	3511.825	243640.1	424.2960	375.0630	4.520329
F-statistic	1.289314	36.75788	12.63377	10.11430	1.176454
Log likelihood	-260.4846	-379.1922	-201.3077	-197.8543	-74.13603
Akaike AIC	19.46319	27.94230	15.23627	14.98959	6.152573
Schwarz SC	20.03413	28.51324	15.80721	15.56054	6.723518
Mean dependent	1297.113	461735.2	611.2047	630.5969	0.216071
S.D. dependent	3713.029	961314.7	1016.513	814.2611	4.679989
Determinant resid covariance (dof adj.)		4.88E+28			
Determinant resid covariance		2.98E+27			
Log likelihood		-1084.296			
Akaike information criterion		82.09257			
Schwarz criterion		85.18519			

Table 4:

Pairwise Granger Causality Tests
Date: 11/20/16 Time: 01:26
Sample: 1984 2014
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
BCP does not Granger Cause ACGSF	29	0.23482	0.7925
ACGSF does not Granger Cause BCP		14.0461	9.E-05
GDPMA does not Granger Cause ACGSF	29	0.98613	0.3876
ACGSF does not Granger Cause GDPMA		3.69899	0.0398
MS does not Granger Cause ACGSF	29	4.00214	0.0316
ACGSF does notGranger Cause MS		1.30308	0.2902
PLR does not Granger Cause ACGSF	29	0.32218	0.7277
ACGSF does not Granger Cause PLR		0.87801	0.4285
GDPMA does not Granger Cause BCP	29	4.96648	0.0157
BCP does not Granger Cause GDPMA		2.01037	0.1559
MS does not Granger Cause BCP	29	18.7087	1.E-05
BCP does not Granger Cause MS		3.24779	0.0565
PLR does not Granger Cause BCP	29	0.22817	0.7977
BCP does not Granger Cause PLR		0.65777	0.5271
MS does not Granger Cause GDPMA	29	3.36789	0.0514
GDPMA does not Granger Cause MS		1.18588	0.3227
PLR does not Granger Cause GDPMA	29	0.30951	0.7367
GDPMA does not Granger Cause PLR		2.52605	0.1010
PLR does not Granger Cause MS	29	0.01937	0.9808
MS does not Granger Cause PLR		0.75500	0.4808