CREDIT SUPPLY AND EXPORTS DIVERSIFICATION: AN EMPIRICAL ANALYSIS OF NIGERIA

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Abstract:

The main objective of this paper is to examine the impact of credit supply and other instrumental variables on export diversification in Nigeria. Over dependence on oil as major source of foreign exchange has been a concern because of the adverse effects of oil shocks on the economy. OLS regression method is used and the empirical results shows that bank credits promote export diversification but the influence is not significant. World price for agric products positively and significantly promote exports diversification and exchange rate negatively affect diversification. Rainfall strongly promotes exports diversification. There is therefore the need to increase credits to the agricultural sector and policies that stabilizes exchange rate should be taken. Also strategies to improve the competitiveness of agricultural products in the international markets are a crucial factor in promoting export diversification in Nigeria.

KeyWords: Export Diversification, Credits, Exchange Rate, Agriculture.

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INTRODUCTION:

Prior to the discovery of oil in commercial quantity in Nigeria, agriculture played a dominant role in the economy. Export of major crops such as cocoa, rubber, palm-oil, cotton, groundnuts, ect, were the major source of foreign revenue which was used to finance the development of other sectors including oil. Agricultural exports accounted for over 70 percent of foreign exchange earnings and contributed to 60 percent of GDP in 1970 (CBN, 2007). This role began to decline with the exploration of oil and the oil boom of mid 1970s. Attention was then diverted from agriculture to oil sector and there was massive investment in construction and service sectors. The fortunes of agriculture was taken by oil sector and oil and gas exploration accounted for about 98 percent of export earnings and 83 percent of federal government revenue (Export Import Bank, 2009). The contribution of oil sector alone to GDP was more than 40% and about 95% of foreign exchange earnings came from oil, making Nigeria the world most oil dependent economy.

Poor financing and low credit supply have been identified as the major constraint to the development of agricultural sector in Nigeria. For example, the percentage share of agriculture in the total government expenditure continued to decline and commercial banks lending to the sector has been negligible. Commercial banks are reluctant to grant loan to agriculture due to high risks associated with the sector. Agricultural credit as percentage of the total commercial banks credit continued to decline too. The percentage credit to agricultural sector in the period 1991-1997 was 14.52 and this declined to 9.36 in 1999 and further down to 6.31 and 2.15 in 2002 and 2007 respectively (CBN, 2007).

Finance has been identified as key ingredient in the development of agriculture and exports diversification and successive government in Nigeria introduced policies that intended to boost the supply of credit to the sector. There was the agricultural credit guarantee scheme fund (ACGSF) which was introduced in 1977 by the government with the initial start-up capital of 100 million with aim of promoting credit to agriculture. This capital was raised to 6 billion in 2006 in order to make agriculture lucrative. The Central Bank the on its part directed commercial banks to increase the percentage of their total lending to agriculture. The main objective of this

paper therefore is to examine the impact of credit supply on export diversification in Nigeria. The rest of the paper is designed as follows:

EMPIRICAL LITERETURES:

There are many empirical studies that tried to examine the determinants of agricultural exports in various economies and some these works include the following:

Rosemary N. (2004) examine the implications of Nigeria membership of the WTO and subsequent implementation of its agreements on the growth of Nigeria non-oil exports which have dwindled from an average of 7% in the period 1970-85 to 4% in the period 1986 to 2000 using VECM. The results showed that global integration proxied by trade openness, though positive, was no significant in explaining the behavior of non-oil export in the long run as well as in the short run. The growth in the import of capital inputs positively impact on the growth of non-oil export. She concluded that, while Nigeria is not able to gain from greater integration and trade, her trading partners gained from greater access into Nigerian market. The paper recommended that Nigeria should renegotiate her commitments with a view to increasing them.

Abolagba et. al (2010) examined the factors that influences agric exports with specific reference to cocoa and rubber using OLS regression method. The findings revealed that rubber export is influenced significantly by domestic rubber production, producer price, exchange rate, domestic consumption and interest rate. Cocoa export is influenced by cocoa outputs, domestic consumption and rainfall. It is recommended that there should be value addition in respect of the cocoa exports.

Nkang N. et. al (2006) examined the response of cocoa output to price and non-price in the face of the trending down of cocoa outputs over time using error correction model (ECM). The ECM results shows that any disequilibrium away from the long run steady state equilibrium of cocoa exports is corrected within one year in the short run, real cocoa producer price has significant but negative effect on cocoa export supply. However, in the long run, the effect of the real producer price on cocoa export supply is significant, positive and inelastic. Foreign income indicates a negative but non-significant effect on export supply in both short and long runs. The results, among others, shows that there may be a promise for increased cocoa export in the long run, when it would have been possible for harvested hectors to be expanded and/or exists low-

yielding and aging trees replaced. Overall, increased domestic production and increase in domestic industrial utilization will increase income and price elasticities of its manufactured exports compared with primary products.

Yusuf S. and Yusuf W. (2007) examine factors that determine the export performance of the three major agric exportable commodities of cocoa, rubber and palm-kanel in the context of liberalization using error correction model. The ECM results shows that the previous year's output and the next value of world trade negatively affect cocoa export at 1% level while the previous GDP positively contributes to cocoa export at 5%. The lagged price ratio reduce rubber export significantly at 5% but real exchange rate significantly increase the export performance of rubber at 10% level. The previous year export of palm-kanel and the real GDP contribute positively to palm-kanel export at 5% level while the lagged premium and palm-kanel output growth negatively contribute to its exports at 5% and 10% respectively. Promotion of agric export is essential to reduce the burden of dependence on oil exports.

Amin (1996) estimates the effects of exchange rate policies on prices of export crops and on Cameroon's agricultural export competitiveness. After calculating the nominal protection coefficient (NPC) and the nominal protection rates (NPR) for the crops considered (cocoa, coffee), and estimating the real exchange rate (RER) and the extent of the over-valuation, Amin reached the following conclusions: the agricultural sector is heavily taxed through a high level of intervention and over-valuation. The levels of real over-valuation are quite high, up to 77%, and estimates show that a 10% depreciation of RER stimulates about 1.0% increase of cocoa relative to the price of tradeables. He extended the same specification to other products, and the results from the OLS estimation showed that overall the variables were not statistically significant at the 5% level, although they had the right signs. The response of cocoa and coffee to foreign income was fairly elastic for cocoa and fairly inelastic for coffee. For a better performance of the agricultural sector and the economy as a whole, the author recommended the removal of government interventions and an examination of the question of depreciation of the RER. This last point should include looking at major agricultural constraints, particularly the factors that have reduced agricultural exports.

Lukonga (1994) examined the factors underlying the past performance of Nigeria's non-oil exports. OLS estimation procedures were used to obtain estimates for three commodities, cocoa,

palm kernel and rubber. Cocoa yielded statistically significant price elasticities with the expected sign, indicating that the commodity responds positively to changes in relative prices. Overall, the results provided evidence of and support for the usefulness of pricing policy in eliciting export supply, denoted a weak relationship between agricultural output and export trends, supported the view that domestic market conditions strongly influenced export behaviour, and denoted poor performance with regard to lagged exports. This last finding, supported by Mundlak and Larson (1992), contrasts markedly with the results of many other recent works on agricultural exports. Islam and Subramanian (1989) emphasize the relatively insignificant role of price compared with non-price factors in explaining export supply.

In Côte d'Ivoire, Trivedi and Akiyama's (1992) findings in evaluating pricing policies for perennial crops vary across commodities. While coffee is highly sensitive to price factors, cocoa is less price sensitive. Many studies found the income elasticity of demand to be low for agricultural exports. Islam and Subramanian (1989) stress that for tropical traditional commodities, the income and price elasticities of demand are low and almost certainly less than unity. Ghura and Grennes (1994), however, found that primary exports are responsive to world real income. According to these authors, the impact of a 1% increase in OECD real income growth is to increase primary export demand by 1.6%, implying that a world recession has the potential to disrupt export growth, thus lowering economic growth in SSA. This view is supported by other works (Love, 1982; Donges and Riedel, 1977; Balassa, 1990).

3. DATA AND METHODOLOGY:

The data used in this study is secondary which are sourced from Central Bank of Nigeria (CBN) statistical bulletin and the National Bureau of statistics for the period 1976 to 2009. The data includes exports diversification (**XPDIVERS**) proxied by the ratio of agricultural export to total export, banks credit to agricultural sector (**BCRDT**), foreign direct investment (**FDI**), interest rate (**INTRATE**), exchange rate (**EXRATE**), and world price for agricultural exports (**XPRI**).

The above variables are defined as follows:

Export Diversification (XPDV): this is the ratio of agricultural exports in total exports.

Bank Credits to Agriculture (BCRDT): This is the loan by commercial banks that is directed to agriculture and it serves as the good source of fund for farmers to invest in expanding production. It is positively related to farmers output because credit expands the potentials of farmers to purchase the inputs required for increased production and export.

Foreign Direct Investment (FDI): this is the investment that flows into the country in hard currency from abroad.

Interest Rate (INTRATE): This is the lending rate or the amount of charges made by commercial banks on loans issued to their customers. Interest is negatively related to exports output because higher interest reduces the access to credit by farmers which lower investment and export production.

Exchange Rate (EXRATE): This is the rate at which the local currency (naira) is exchange for the currency of other country. An appreciation in the naira exchange rate discourages buyers of agric exports in the international market and vice-versa.

Price of Exports (XPRI): this is the price at which domestic agricultural products are sold in the international market and the higher the prices the greater the exports of agricultural products.

MODEL SPECIFICATION

Following Eyo (2008) with some modifications, we first examined the determinants of credit and the implicit form of the model is given as:

$$\text{BCRDT} = a + b_1\text{XPDIVERS} + b_2\text{FDI} + b_3\text{INTRATE} + b_4\text{EXRATE} + b_5\text{XPRICE} + u \ldots\ldots\ldots\ldots(1)$$

And in the second equation export diversification is given as:

$$\text{XPDIVERS} = a + b_1\text{BCRDT} + b_2\text{FDI} + b_3\text{INTRATE} + b_4\text{EXRATE} + b_5\text{XPRICE} + u \ldots\ldots\ldots\ldots(2)$$

Where:

XPDIVERS= Export diversification.

BCRDT   = Commercial banks credits to agriculture

FDI   = foreign direct investment

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INTRATE = Interest rate

EXRATE = Exchange rate

XPRICE = world price for major agric export crops

a = Intercept

b_1- b_5 = coefficients

u = Stochastic disturbance term

4. RESULTS AND DISCUSSIONS:

Table 1. Augmented Dickey-Fuller test of unit root.

Variable	Critical value	ADF stat	Order I	%
Logxpdivers	-3.6496	-6.067678	I(1)	1
Logbcredit	-3.6496	-5.289011	I(1)	1
Logfdi	-3.6496	-5.130838	I(1)	1
Logintrate	-3.6496	-7.574343	I(1)	1
Logexrate	-3.6496	-5.050989	I(1)	1
Logagrxpprice	-3.6496	-4.747472	I(1)	1

Source: Researcher Computation with Eviews software 4.0

From table 1, If the calculated value of the ADF statistics is less than the tabulated or critical value, we do not reject the null hypothesis in which case the variable is stationary. On the other hand if the calculated value of ADF statistics is greater than the tabulated or critical value we reject the null hypothesis in which case the variable is non stationary. Thus all the variables included in the model are stationary after taking the first difference.

Table 2. (Johansen Cointegration Test)

EigenValue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value
0.647017	92.61464	104.94	114.36
0.485389	58.25056	77.74	85.78

0.392112	36.32724	54.64	61.24
0.273336	19.90099	34.55	40.49
0.215041	9.364375	18.17	23.46
0.040789	1.374270	3.74	6.40

Source: Researcher Computation with Eviews software 4.0

From table 2 above the Johansen procedure to test whether the variables that are non stationary have any long run equilibrium relationship or not was carried out. The long run test shows that the null hypothesis of no cointegration between the variables can be accepted.

Discussions of Results

Estimated Results from Equation 1.

BCREDIT=0.510+0.032FDI+0.23AGRXPPRICE+0.63XPDIVERS+0.06EXRATE+0.31INTRATE

$$(0.47) \quad (2.73) \quad\quad (2.29) \quad\quad (2.70) \quad\quad (1.59)$$

$R^2 = 99$ DW = 1.70   F-Stat =218

 t-values in parenthesis

In equation 1 all the explanatory variables in the model with the exception of interest rate have the expected signs. World export prices, exchange rate, interest rate and diversification significantly influence banks credit to agriculture. From the results, a percentage increase in world export prices for agricultural products increase banks credit by 0.23 percent and the coefficient is statistically significantt. An increased export price stimulates production of export produce, investment and credit to agricultural sector. Similarly, a percentage increase in exchange rate increase credit by 0.06 percent. Also a percentage increase in interest rate increase credit by 0.31 percent but the coefficient is not significant.

Estimated Results from Equation 2.

$XPDIVERS = 0.89 + 0.10BCREDIT + 0.06FDI + 0.11INTRATE - 0.17EXRATE + 0.57AGRXPPRICE$

$$(0.47) \quad\quad (0.73) \quad (2.18) \quad\quad (2.71) \quad\quad (3.42)$$

$R^2 = 99$ DW = 1.87   F-Stat = 314

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t-values in parenthesis

Results from equation 2 implies that a 1% increase in banks credit leads to 0.10 percent increase in export diversification but the coefficient is not statistically significant. This is consistent with the priori that increased commercial banks credit boost the production of export produce as farmers have access to funds needed to purchase the needed inputs. But the coefficient of credit is not significant in explaining export diversification and this reflect the fact that credits to agricultural sector is very low. A review of commercial banks credit shows that in 2009 and 2010, agricultural share of bank loans was put at an average of 0.85%, in contrast to oil and gas sector's share of 12.5% (First Bank, 2011). Emmanuel O. (2008) reported similar results.

Again, the results indicate that a 1% increase in interest rate leads to 0.11 percent increase in export diversification. The positive sign contradicted the priori but can be explained that investors in Nigeria borrow irrespective of the interest rate especially farmers that desperately looks for the available credits. Also, the higher the interest rate the larger the credit available for investment purposes.

A 1% increase in exchange rate leads to a decline in export diversification by 0.17 percent and the coefficient is statistically significant. This is so because, although, depreciation in the exchange rate might increase the demand for Nigeria's export abroad, supply of exports produce is constraint by high cost of agricultural inputs resulting from depreciation in naira value. In addition, given the high level of food import, increase in exchange rate leads to high cost of food items pushing farmers to reallocate large proportion of their resource including lands towards producing and purchasing foods. This findings is in conformity with that of Abolagba (2010)

A 1% increase in the world price for agricultural exports increase export diversification by 0.57 percent and the coefficient is highly significant at 1%. In other words, 57 percent in the variation in rate of exports deiversification is explained by international price for agricultural products. This is consistent with the priori that higher prices act as an incentive to domestic producers in addition to providing good profits that can be used to finance expansion. This is true in Nigeria that has over the period experience depreciation in its currency such that hard currency received

by exporters provides huge gains when converted to local currency. Thus higher prices serve as a serious stimulus for increased agricultural exports.

Diagnostic Tests

The goodness of fit of the model is strong as shown by high R^2 of 0.99 implying that 99% in the changes in the degree of export diversification is explained by the explanatory variables. The results also indicated the absence of first-order auto-correlation as shown by Durbin-Watson 1.87. Also the explanatory variables combined strongly influence the degree of export diversification as indicated by the F-Statistic value of 314.

The Jarque-Bera Normality test on the residuals, with F-statistics of 1.8973, could not reject the null hypothesis of normality of the data.

Finally, the Autoregressive Conditional Heteroskedasticity test results gives F-statistics of (1.0956) indicating the absence of heteroskedasticity in the model.

From the battery of diagnostic tests presented and discussed above we conclude that the model is well estimated and that the observed data fits the model specification adequately, thus the coefficients are valid for policy discussion.

CONCLUSION AND POLICY IMPLICATIONS:

In this paper the impact of credit supply on export diversification is examined. The major findings revealed that credit supply to agricultural sector and international price for agric exports has a positive impact on export diversification while exchange rate negatively affects export diversification. The impact of credit supply on export diversification is not strong because commercial banks credits to agriculture as a percentage of total credits has been very low and this does not help the development of the sector. Depreciation in the domestic currency has a negative effect on exports diversification. The monetary authorities should adopt a mechanism that will lead to the stability of the exchange rate and ensure policies that increase banks credit agriculture. Strategies should be adopted to improve the competitiveness of Nigerian agriculture products in international markets in addition to investment in agricultural research, improve markets, infrastructure and institutions.

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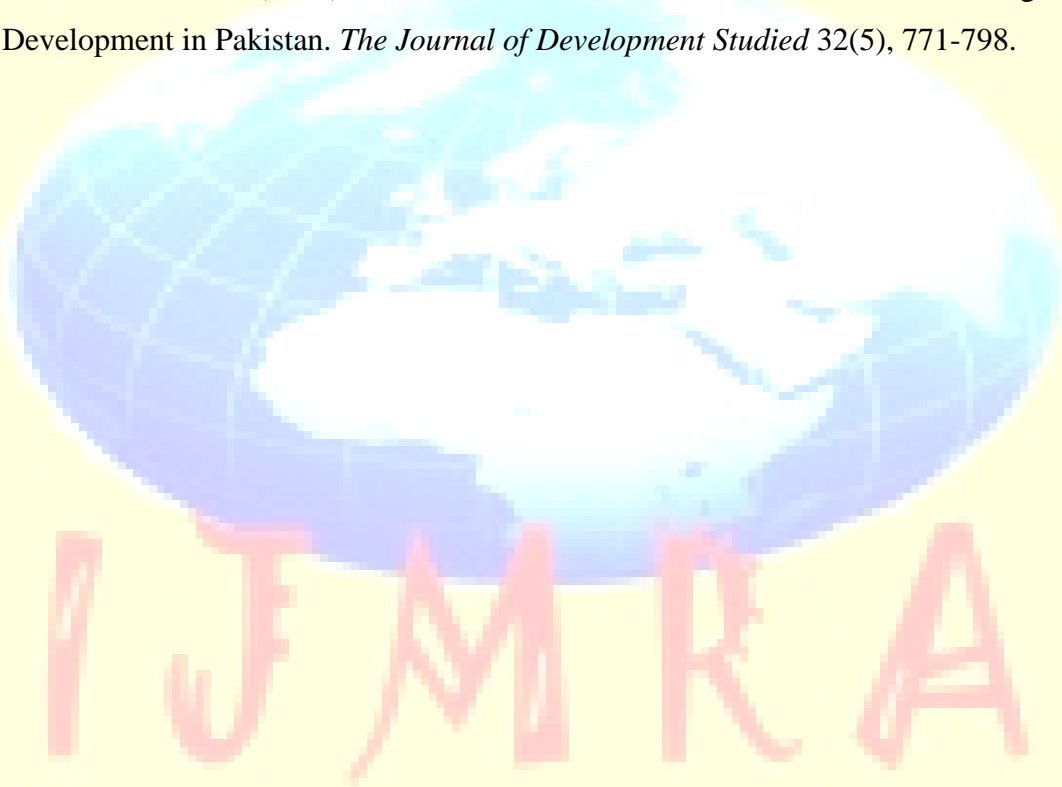
Appendix 1

Figure 1. Agricultural Credit Guarantee Scheme Funds (1976-2009)
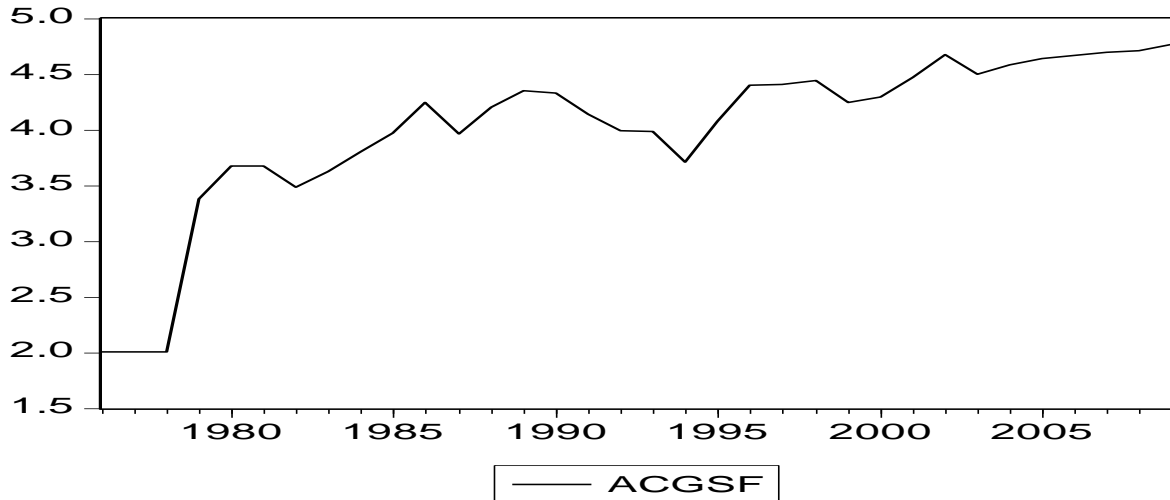

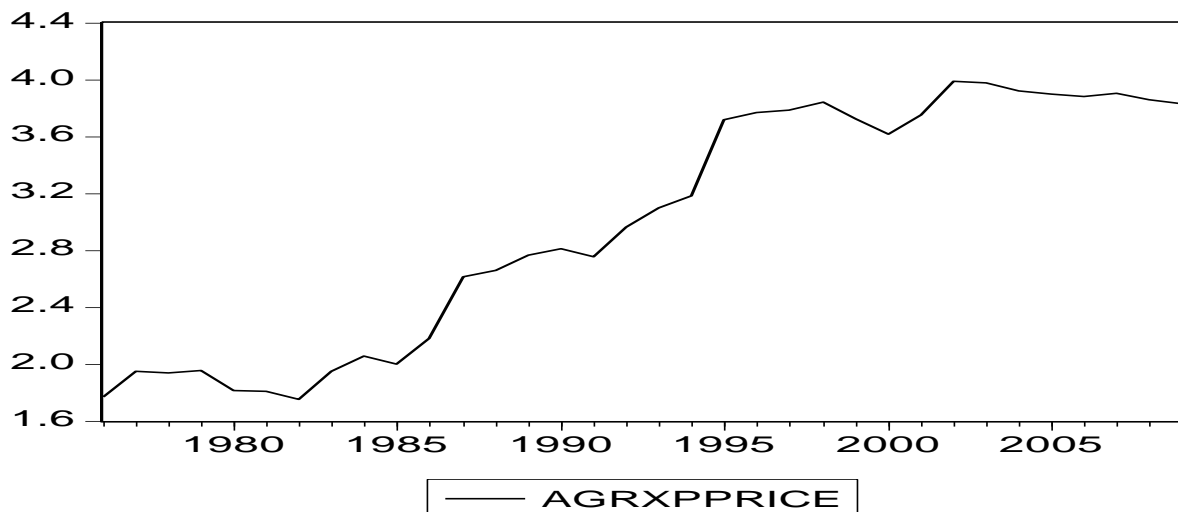Figure 2. International Agricultural Export Price (1976-2009)

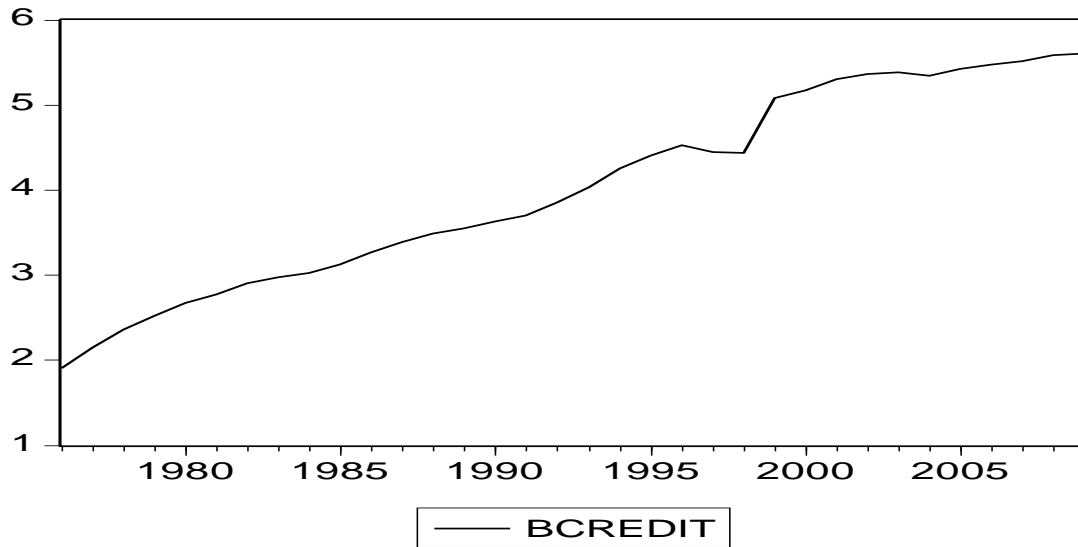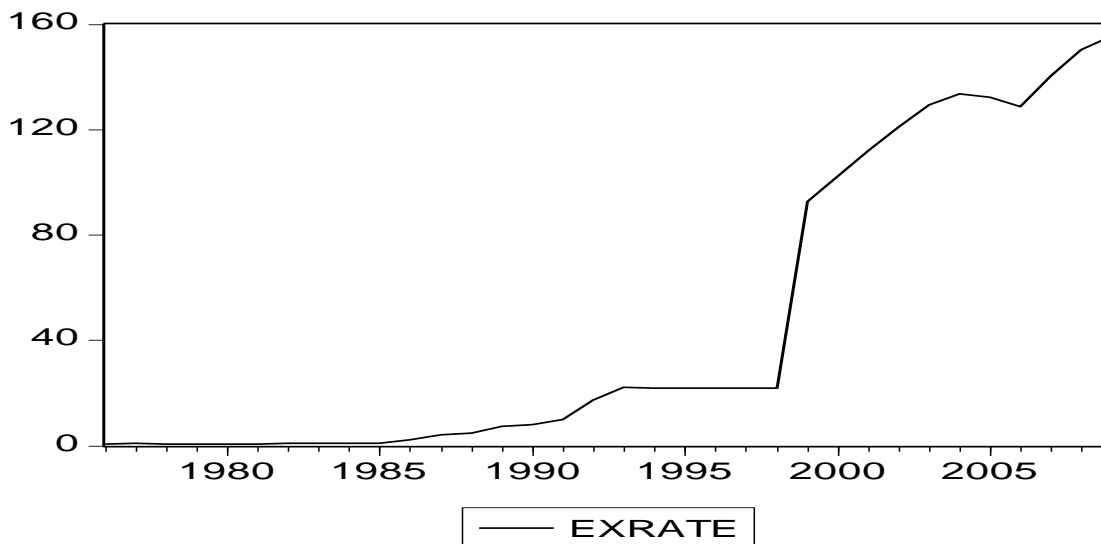Figure 3. Commercial Banks Credit to Agric Sector (1976-2009)

Figure 4. Exchange rate (1976-2009)

Figure 5. Ration of Agric Export to Total Exports