INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN ECONOMICS & MANAGEMENT SCIENCES

OPEN ACCESS JOURNAL

Vol 3, Issue 4, (2014) E-ISSN: 2226-3624

Measuring the Responsiveness of Agricultural Supply to Macro-Economic Environmental Factors: Evidence from Nigeria

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To Link this Article: http://dx.doi.org/10.6007/IJAREMS/v3-i4/1102 DOI:10.6007/IJAREMS/v3-i4/1102

Published Online: 03 July, 2014

Abstract

Evaluating the responsiveness of agricultural supply to macro-economic environmental factors is an important step to implementing agricultural policies in Nigeria. This study investigated agricultural output responsiveness to the level of infrastructure, rate of Inflation, exchange rate volatility, and financial deepening in the sector using annual time series spanning from 1971 to 2008, and source from CBN statistical bulletin. The study through the Augmented Dickey-Fuller (ADF) test of unit root shows that all variables were stationary and integrated of the same order [I(1)]. Further, the Johannsen test of cointegration established the existence of a long-run relationship among the variables. Moreover, from the Vector Error Correction model estimated, aggregate agricultural supply was inelastic to the level of infrastructure, exchange rate volatility and financial development; while the rate of inflation appears elastic. Also, it was uncovered that exchange rate volatility and inflation rate affect the sector negatively. It was based on the findings that the researchers proffers improving and providing quality infrastructure facilities to rural communities and a well-coordinated and articulated monetary and fiscal policy to abate the effect of exchange rate volatility and soaring inflation rate on agricultural supply in Nigeria.

Keywords: Agriculture, Exchange rate, Financial deepening, Inflation,

Introduction

Arguably, a vibrant, resilient and highly productive agricultural sector is, indubitably, a pivotal springboard and a precursor for socio-economic and industrial take-off of an economy, incisively in a developing nation. This has been empirically attested for in the literature that the sector's transformation was at the fore front of the industrial revolution of the nineteen century (Anyanwuocha, 2006; Eicher and Witt, 1964; Oluwasanmi, 1966; Jones and Woolf,

1969), and most developed and emerging economies achieved momentous growth by structurally developing their agricultural sector.

Agriculture remains the mainstay of the Nigerian economy despite its decline in the 1970s. Greater proportions of the population depend on the agricultural sector for their livelihood and the rural economy is still basically agricultural (Mike, 1998). The first decade after independence in 1960 showed a stupendous growth and contribution of the agriculture sector in the Nigerian economy. The Nigerian economy at that time was purely agrarian. From the standpoint of occupational distribution and contribution to the GDP, agriculture was the leading sector (Ogen, 2007). In the 60s, Nigeria was among the world's top exporters of palm fruit, groundnut, cocoa, cotton, rubber, among other cash crops. The sector accounted for over 60%, on average, to the GDP, 70% of her total export, and substantial part of the country's foreign exchange earnings (CBN, 2005). The sector also provided basic food crops to feed her growing population and nurtured it nascent industrial sector for effective take-off by providing raw materials to the sector, as well as serving as a potential market for industrial products(Anyanwuocha,2006; Ogen, 2007). These feats were achieved against the backdrop of a technologically backward agricultural sector that was characterized by peasant and crude farming practices.

However, the decade after independence was not favorable for the sector as it shed-off significant part of its prominence in the economy. Ever since, the growth rate of agricultural production has been erratic as experienced in Nigeria. For example, the rate of agricultural production exhibited an undulating trend pattern over the years 1971-2008, as shown in the figure below.

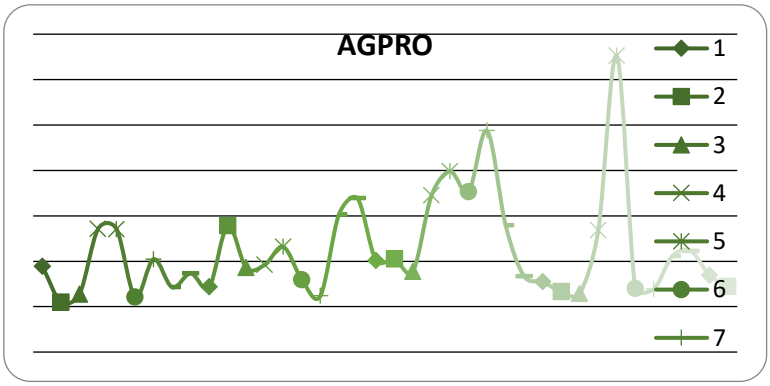

Figure 1: Trend of Agricultural Production Growth Rates (1971-2008)

Moreover, there has been persistent food production shortfall beginning from 1968, because domestic production can no longer meet the rising domestic demand, thus necessitating food importation (see Table 1). Currently Nigeria spends a significant amount on importation of wheat, rice, among other food commodities to augment local production, and rightly qualifies to be named an import-dependent country in this respect.

Table 1
Food Production, Domestic Demand, and Imports(Million Mt)

Description	1994	1995	1996	1997	1998	1999	2000	2001
Production	86.7	89.3	93.4	95.6	98.7	100.4	102.1	103.9
Domestic demand	87.2	89.6	96.3	99	101.9	104.6	107.5	110.4
Shortfall	0.95	0.3	2.9	3.4	3.2	4.4	5.4	6.5

Sources: NBS (Review of Nigerian Economy): Various Issues

These vicissitudes in agricultural produce could be attributed to a number of price and non-price factors, such as its neglects during the hey days of oil discovery in commercial quantity; climate variability and structural rigidity, which has been intensified by the current global warming; international price volatility which has created extreme uncertainty in farmers' income and led to inefficient allocation of resources; and most important, poor domestic macroeconomic environment, which has adversely affected productivity in the sector.

In response to the poor performance of the agricultural sector since the 1970s', successive administrations had formulated and implemented series of agricultural and macro polices targeted towards improving the macroeconomic environment that serve as incentives and capabilities-improving factors to producers in the sector. Remarkably, efforts have been made on improving rural infrastructure, provision of cheap credit to farmers, monetary policy aimed at stabilizing domestic price level and exchange rate.

Thus, it becomes highly imperative to undertake a rigorous study to measuring the responsiveness of aggregate agricultural supply to macroeconomic incentives. This is important because, given its relative size (agriculture) in the Nigerian economy, a significant positive response to macro incentives means an overall performance of the economy. As opined by Julie (2006), macroeconomic factors such as better infrastructure, lower inflation and financial development help in increasing the competitiveness and productivity of the sector, decrease the adverse effect on the sector given it exposure to international market, and aid farmers in risk management. Therefore, it becomes paramount to monitor the responsiveness of aggregate agricultural supply to such macro incentives.

Research Problem

The response of agricultural supply to macroeconomic environment factors has been widely discussed in the literature (Binswanger et al, 1987; Schiff and Montenegro, 1997; Krueger et al, 1991; Mundlak, 1997; Julie, 2006; Weir and Knight, 2004), and most of these studies seem to be cross-country analysis. However, in Nigeria, there exists a dearth of empirical studies on the topic. While most of the studies on agricultural productivity and supply response in Nigeria have focused mostly on a single variable, such as inflation, exchange rate, price volatility, or the impact of agricultural policy (Adubi et al, 1999; Obasi et al, 2007; Mike et al, 1998;Abiola et al, 2010). This study supplements the results of the literature by integrating core macroeconomic factors (infrastructure, real exchange rate volatility, financial deepening in the sector, and inflation)in an estimated agricultural supply model.

This study was motivated by the works of Schiff and Montenegro (1997) and Julie (2006). They assert that supply elasticity only makes sense if the conditions under which prices behave are specified. According to them, these conditions depend in particular on the

expenditure in public goods and the consequences of reforms on investment, inflation and real exchange rate. Thus, given that the effect of price and its volatility on agricultural supply response is conditional on domestic macroeconomic factors, it becomes appropriate to first analyze the responsiveness of supply response to these factors in Nigeria. This paper is therefore expedient because it constructively informs policy stance on issues affecting agriculture productivity in Nigeria.

Objective

This study revolves around two cardinal objectives, which are to:

- Evaluate the nature of relationship between agricultural supply and macroeconomic environmental factors- infrastructure, inflation, exchange rate volatility, and financial intermediation- in Nigeria, and;
- To determine the responsiveness of agricultural supply to macroeconomic environmental factors.

This is a first step in evaluating under which conditions a stronger exposure to international market does not result in a stronger exposure to price shocks, as opined by Julie (2006).

Organization of the Study

This paper is divided into four sections. Following the background, Section II set out the research methodology, while Section III presents and analyses the empirical results. Section IV rounds it up with the conclusion and recommendations.

Research Methodology and Materials

The Econometric Model

To empirically analyse agricultural supply response to macroeconomic environmental factors, we adopted a modified variance of the reference econometric model of supply response as developed by Julie (2006). Our model parochially takes into account, explicitly, macroeconomic factors perceived to influence agricultural supply in Nigeria, such as Infrastructure, financial deepening in the sector, inflation, and exchange rate volatility:

$$AGPRO_t = \gamma_0 + \gamma_1 INFRAS_t + \gamma_2 FINDE_t + \gamma_3 INF_t + \gamma_4 EXCV_t + \varepsilon_t \ldots\ldots 1$$

Where AGPRO represents agricultural production growth rate, INFRAS represents infrastructure, FINDE is the level of financial intermediation, INF and EXCV are inflation and exchange rate volatility, respectively, and ε is the residual term.

Moreover, in measuring the responsiveness of agricultural supply to these factors, we restructure equation 1 by estimating a log linear supply response model:

$$lnAGPRO_t = \gamma_0 + \gamma_1 lnINFRAS_t + \gamma_2 lnFINDE_t + \gamma_3 lnINF_t + \gamma_4 lnEXCV_t + \varepsilon_t \ldots\ldots\ldots 2$$

Where *ln* represents natural logarithm

Description and Measurement of Variables

- *Infrastructure*

Infrastructure means the capital equipment used to produce publicly and privately available services, including transport facilities, water supplies, electricity, etc. (Black, 2002). It has been affirmed in the literature that infrastructure (private and public) has a positive relationship with agricultural production because it increases the productivity, competiveness, economic efficiency, and provides safety nets for farmers to mitigate adverse effects of price shocks by improving their risk coping capacity; however, this is contingent on

the level and quality of the infrastructural base. This variable is proxy by capital expenditure to the agricultural sector as a percentage of total capital expenditure by the government.

Financial Intermediation

This variable mirrors the degree of involvement of the banking sub-sector in the extension of credit and other financial facilities for the promotion of investment activity of the sector. In addition to providing loanable funds to farmers, a well-developed formal financial sector also helps in improving the risk coping capacity of the farmers. The formal financial system offers to producers financial opportunities for their savings. Producers who are forced to self-financing and self-insuring can have access to remunerated deposits, which is an incentive to save (McKinnon, 1973).Therefore, by encouraging cautionary saving, producers are more impervious to uncertainty and price instability. In the literature, this variable is proxy by the ratio of private credit to the GDP; however, given the study sectorial analysis, this variable is proxy by the ratio of agricultural credit to total bank credit in the economy.

- *Inflation*

The rate of inflation provides information on variability of domestic price level, and it is included among the list of explanatory variables to capture the effect of macroeconomic instability on agricultural supply. Inflation, as discussed extensively in empirical studies, has a negative relationship with agricultural production. A high rate of inflation pace down general economic activities by impairing aggregate demand; erodes farmers real income; makes producers more susceptible to price instability; and leads to inefficient allocation of resources in the sector. In compendium, an unexpected spike of the inflation rate reduces agricultural production. The domestic consumer price index is the proxy for its measurement.

- *Exchange Rate Volatility*

Exchange rate volatility measures the trend movement of exchange rate overtime. Though a consensus has not been reached pertaining it impact on agricultural productivity, however, most studies posit that its variability affect the sector negatively. Exchange rate variability is measured by constructing an index. The study employs coefficient of variation (CV) which expresses the dispersion of observed data values as a percent of the mean of a series as a measure of exchange rate variability.

$$CV = S/\bar{Y} * 100$$

Where S and $\bar{Y}$ represent standard deviation and mean of the series, respectively.

Estimation Technique and Date Sources

Annual data covering the period 1971-2008 were used for this study. Data reflecting proxies for agricultural supply, financial intermediation, inflation, and infrastructure were ferret out from the Central Bank of Nigeria's (CBN) Statistical Bulletin (various issues) and the Nigerian Ministry of Agriculture and Water Resources. Annual values of exchange rate volatility were computed from data obtained from CBN's Statistical Bulletin on annual exchange rate.

The coefficients of the model's variables were estimated using the Vector Error Correction Model (VECM). The Augmented Dickey-Fuller (ADF) test was used to determine the time series properties (for the presence of a unit root) of the stochastic variables. A variable is said to contain a unit root or is I(1) if it is non-stationary. The use of data characterized by unit roots may lead to serious error in statistical inference (Abiodun et al: 2010). Moreover, the Johansen procedure was used to test for co-integration in the model. This technique was adopted not because it is vector auto-regressive based but because it

performs better in multivariate functions. Finally, the error term was tested for unit root for re-confirmation of cointegration and to determine the speed of adjustments of the cointegrated variables towards their equilibrium values.

Presentation of Empirical Findings

This section deals with the presentation and analysis of results. The results capture the objectives of this study. The estimation is carried out using the Economic Views (E views 3.1) statistical software application.

Table 2:
Summary of Descriptive Statistics

	AGPRO	INFRAS	FINDE	INF	EXCV
Mean	**2.860057**	**1.374893**	**1.931235**	**2.662397**	**1.520284**
Median	**2.895225**	**1.406085**	**2.003997**	**2.584929**	**1.601143**
Maximum	**4.704906**	**2.606387**	**3.297759**	**4.287716**	**4.470335**
Minimum	**0.665169**	**-0.261365**	**0.438471**	**0.500775**	**-0.632824**
Std. Dev	**0.887870**	**0.665916**	**0.775635**	**0.810494**	**1.287550**
Skewness	**-0.179575**	**-0.181320**	**-2.109348**	**-0.013702**	**0.444641**
Kurtosis	**2.672770**	**2.482218**	**2.109348**	**3.013803**	**2.567278**
JarqueBera	**0.373775**	**0.632711**	**1.723148**	**0.001491**	**1.548613**
Observation	**38**	**38**	**38**	**38**	**38**

Source: Data Analysis 2014

From table 2, the skewness which measures the asymmetry of the distribution of the series around its mean has values less than zero, except in one case. This indicates skewness to the left. The Kurtosis, measuring the paekedness or flatness of the distribution with an expected value of at most 3.0, shows that all variables satisfy the condition. The Jacque-Bera test of normality in distribution has the null hypothesis of normally distributed residuals. The probability value indicates an acceptance of the null hypothesis that the residuals are normally distributed.

For cointegration analysis, It is important to check the unit roots at the outset to ascertain whether modeled variables are I(1) at levels and I(0) at differences. Table 3 presents the results of the unit root test using ADF.

Table 3:
Unit Root Test

Variable	***ADF Test Statistics***	***Critical Values 5%***	***Order of integration***
InAGPRO	-2.0738	-2.9446	Non Stationary in level I(0)
	-7.3184	-2.9472	Stationary at first difference I(1)
InINFRAS	-2.6980	-2.9446	Non Stationary in level I(0)
	-5.1986	-2.9472	Stationary at first difference I(1)
InFINDE	-0.4300	-2.9446	Non Stationary in level I(0)
	-3.0569	-2.9472	Stationary at first difference I(1)
InINF	-3.6861	-2.9446	Stationary in level I(0)
	-5.9167	-2.9472	Stationary at first difference I(1)
InEXCV	-2.9035	-2.9472	Non Stationary in level I(0)
	-5.5989	-2.9472	Stationary at first difference I(1)

Source: Data Analysis 2014

The result of the ADF test shows that all the variables are stationary at first difference. All variables, however, are carried along to be tested for cointegration. The synopsis of the Johansen cointegration test is shown in table below.

Table 4:
Summary of Johansen Cointegration test

Eigenvalue	***Likelihood Ratio***	***5 percent critical value***	***1 percent critical value***	***Hypothesized No. of CE(s)***	***Null***	***Alternative***
0.726640	107.6587	68.52	76.07	None**	R=0	r =1
0.610727	60.96796	47.21	54.46	At most 1**	r≤1	r = 2
0.448568	27.00292	29.68	35.6	At most 2	r≤2	r = 3
0.129942	5.574413	15.41	20.04	At most 3	r≤3	r = 4
0.015527	0.563364	3.76	6.65	At most 4	r≤4	r = 5

****(*) denotes rejection of the hypothesis at 5 %(1%) significance level**
L.R. test indicates 2 cointegrating equation(s) at 5% significance level
Source: Data Analysis

The cointegration test reveals that both the trace test and maximum Eigen value test showed the existence of two cointegrating vectors, thus the rejection of the null hypothesis of r = 0. Test statistics from the maximum Eigen value are consistent in suggesting that there are two integrating vectors among the variables. Therefore, the explanatory variables are cointegrated and have short run and long run relationships with the dependent variable; there is a perceptible, common trend in the process.

Vector Error Correction Model Estimates

The existence of these cointegrating relationships in the model then motivates the estimation of a vector error correction model (VECM) to account for short-run as well as long-run or transitory dynamics.In the table below, the estimates of the vector error correction model is presented in table 1a and 1b (at the Appendix)

Table 1a shows the cointegrating vector or long run relationship. In the long run, agricultural supply is co-integrated with exchange rate volatility, financial development and the rate of inflation; while there exist no long run relationship with infrastructure and agricultural supply in Nigeria. This finding asserts and it is in conformity with previous studies (Mundlak et al, 1997; Julie, 2006; Adubi et al 1999…) that agricultural supply is influenced by the rate of inflation, financial development and exchange rate volatility.

From the vector error correction model presented on 1b, comparing the error correction terms for the first vector shows that both AGPRO and FINDE have their error correction terms rightly signed and statistically significant (at 5 and 10 percent, respectively). This suggests that AGPRO and FINDE equations constitute the true cointegrating relationship in the first cointegrating vector. Other variables error correction terms are either not significant (INFRAS) or wrongly signed (INF and EXCV). The result suggests that the speeds of adjustment back to equilibrium are 98 and 23 percent for AGPRO and FINDE, respectively. The coefficient of determination (R^2) of agricultural supply is 0.569, thus the independent variables explain 56.9 percent of the variations in the dependent variable. This is modest, statistically.

Furthermore, from Table 1b, the level of Infrastructure significantly affects agricultural supply. AGPRO increases with the level of infrastructural. Inflation rate affects AGPRO in the short run negatively; AGPRO decreases with rising inflation in Nigeria. Although with a positive influence on AGPRO, FINDE's coefficient is not significant. Also, while conforming to apriori knowledge, exchange rate volatility impedes growth, however, not significant. Approaching this more statistically, a one percent increase in INFRAS and FINDE, holding each variable constant at each round, on average, would lead to an increase of agricultural supply by 0.67 and 0.24percent, respectively in the short run. However, a percent increase in exchange rate volatility and inflation rate would lead to a decrease in agricultural supply by 0.4 and 0.07 percent, respectively. Further, the model is statistically significant. This could be read from it F-value of 2.757, which is significant at 5 percent.

From Table 1a, examining the long-run relation in terms of elasticity, agriculture supply, under the period of review, is inelastic to the level of infrastructural base, exchange rate volatility and financial development; their coefficients values are lesser than one. However, it has an elastic nature with the rate of inflation (its coefficient is greater than one). It proves that agricultural production is more responsive to the rate of inflation. This is akin with earlier studies (Mundlak et al, 1997; Julie, 2006). High inflation reinforces price instability to affect agricultural productivity negatively as well as reduces the purchasing naira of agricultural farmers in Nigeria.

Conclusion and Recommendations

It is unanimously accepted that the agricultural sector is a pivotal sector that propels rapidly growth, economic independence and sustainable development of a country. Therefore, in order to tap from the benefits emanating from this sector, effort should be paid to identify those factors influencing its performance. This has been the objective of this work:

measuring the responsiveness of agricultural supply response to macro-economic environmental factors.

The analysis started with the descriptive statistic which showed that the errors are normally distributed and that the distribution has a long left tail. The time series properties of the variables were assessed using the ADF test. All variables were found to be stationary. Also, the Johannsen cointegration test established a long run relationship among the variables.

Furthermore, evidence also suggests that agricultural supply is positively related to financial development and infrastructure, while it has a negative relationship with volatility of the exchange and inflation rates. Also, agricultural supply is highly responsive with the rate of inflation, while it is inelastic with the level of infrastructure, financial development and exchange rate volatility. Thus, the rate of inflation is the most important macro-economic factor, in terms of elasticity, influencing the agricultural sector in Nigeria.

To improve agricultural productivity in Nigeria, the researcher recommends the following based on his empirical findings.

- The Nigerian government should intensify policies on infrastructure development to rural communities which account for about 90 percent of agricultural produce in areas of construction of linkage and feeders roads, health and social amenities, amongst others, to enhancing the capabilities of rural farmers.
- Given the negative relation between agricultural production and exchange rate volatility, the monetary authorities should ensure near stability of the exchange rate in other to improve the risk coping capacity of farmers and help palliate uncertainty in the sector.
- Since it has been established empirically that financial development influences the sector positively, a special, mandatory directive should be given to financial institutions to step-up cheap credit to farmers, and this directive must be complied with. Also, government at all levels should complement this effort by instituting a special credit scheme for farmers, where agric-loans could be sourced with limited constraints.
- A synergy of both monetary and fiscal policy should be encouraged to help stabilize rate of inflation.
- Finally, there is the need for government to establish and fund virile agricultural research institute across the country. The importance of this cannot be overemphasized.

References

Anyamvuocha, R.A.I.(2006). *Fundaments of economics.* Onitsha-Nigeria: African first Publishers Ltd.

Eicher, C. & Witt, L., (1964). *Agriculture in economic development*. New York: Mcgraw Hill.

Oluwasanmi, H.A. (1966). *Agriculture and Nigeria's economic development*. Ibadan: University Press.

Jones, E.I. & Woolf, S.S. (1969). (eds.), *Agrarian change and economic development: the historical problem*. London: Methuen,

Mike, I. O. (1998). *Poverty reduction in Nigeria: the way forward*. Ibadan: NCEMA.

Ogen, O. (2007). *The agricultural sector and Nigeria's development*. NEBULA.

Central Bank of Nigeria Statistical Bulletin (Various issues), Abuja, Nigeria.

Julie, S. (2006)*The impact of world price instability on agricultural supply according to macroeconomic environment*. France: CERDI.

Binswanger H. & Al., (1987). 'On the Determinants of Cross-country Aggregate Agricultural Supply', *Journal of Econometrics, 36(1),* 111-131.

Schiff, M. & Montenegro, C. (1997). 'Aggregate Agricultural Supply Response in Developing Countries'. *Economic Development and Cultural Change 45 (2),* 393-410.

Krueger, A. Schi, M. Valdés, & A. (1991).*Political economy of agricultural pricing policy*. Johns Hopkins: University Press.

Mundlak, Y. Larson, D & Butzer, R. (1997).*'The determinants of agricultural production: a cross- country analysis',* The World Bank WP 1827.

Weir, S. & Knight, J. (2004). 'Externality Effects of Education: Dynamics of the Adoption and Discussion of an Innovation in Rural Ethiopia'. *Economic Development and Cultural Change 53 (1),* 93-113.

Adubi, A. A. & Okunmadewa, F. (1999). Price, Exchange Rate Volatility and Nigeria's Agricultural Trade Flows: A Dynamic Analysis. *African economic Research Consortium (AERC) Research Paper 87. African Economic Research Consortium*, Nairobi March 1999

Obasi, O. U. (2007). *Relative price variability and inflation: evidence from the agricultural sector in Nigeria*. Nairobi: AERC.

Abiodun, E. O. & SheuSalau, A. (2010). *Agricultural response to prices and exchange rate in Nigeria.* Abuja: IFPRI, 2010.

McKinnon, R. (1973). *Money and capital in economic development*. The Brooking Institution.

Date: 09/06/14 Time: 13:08
Sample(adjusted): 1974 2008
Included observations: 35 after adjusting endpoints
Standard errors & t-statistics in parentheses

Vecm Reults
Table 1a

Cointegrating Eq:	CointEq1
INAGPRO(-1)	1.000000
LNINFRAS(-1)	-0.044363
	(0.07722)
	(-0.57451)
LNFINDE(-1)	0.185972
	(0.11526)
	(1.61356)
LNINF(-1)	-1.228532
	(0.13235)
	(-9.28246)

LNEXCV(-1)	-0.312432
	(0.06869)
	(-4.54833)
C	0.579990

Table 1b

Error Correction:	D(INAGPRO)	D(LNINFRAS)	D(LNFINDE)	D(LNINF)	D(LNEXCV)
CointEq1	-0.979377	-0.374903	-0.232160	0.597592	1.439671
	(0.49891)	(0.38771)	(0.17370)	(0.45963)	(0.71213)
	(-1.96303)	(-0.96696)	(-1.33657)	(1.30015)	(2.02165)
D(INAGPRO(-1))	-0.028776	0.058251	0.182131	-0.277065	-0.626205
	(0.38578)	(0.29979)	(0.13431)	(0.35540)	(0.55064)
	(-0.07459)	(0.19430)	(1.35606)	(-0.77958)	(-1.13723)
D(INAGPRO(-2))	-0.315173	-0.209481	0.068165	-0.068002	-0.508962
	(0.22211)	(0.17260)	(0.07733)	(0.20462)	(0.31703)
	(-1.41902)	(-1.21366)	(0.88151)	(-0.33233)	(-1.60542)
D(LNINFRAS(-1))	0.621303	-0.281812	-0.072106	0.204183	-0.263918
	(0.28590)	(0.22218)	(0.09954)	(0.26340)	(0.40809)
	(2.17311)	(-1.26838)	(-0.72440)	(0.77519)	(-0.64672)
D(LNINFRAS(-2))	0.474881	0.297448	0.046453	0.020160	-0.121230
	(0.27751)	(0.21566)	(0.09662)	(0.25567)	(0.39611)
	(1.71119)	(1.37924)	(0.48079)	(0.07885)	(-0.30605)
D(LNFINDE(-1))	0.242179	-0.138043	-0.070627	0.546481	1.582402
	(0.60630)	(0.47116)	(0.21108)	(0.55856)	(0.86540)
	(0.39944)	(-0.29298)	(-0.33459)	(0.97837)	(1.82851)
D(LNFINDE(-2))	0.016563	-0.027470	0.153020	0.772054	-0.561037
	(0.60428)	(0.46960)	(0.21038)	(0.55671)	(0.86253)
	(0.02741)	(-0.05850)	(0.72734)	(1.38682)	(-0.65046)
D(LNINF(-1))	-0.410760	-0.124430	-0.160854	0.282553	0.535892
	(0.46669)	(0.36267)	(0.16248)	(0.42995)	(0.66613)
	(-0.88016)	(-0.34309)	(-0.99001)	(0.65718)	(0.80448)
D(LNINF(-2))	-0.447114	-0.030922	-0.089057	-0.260782	-0.038192
	(0.26140)	(0.20314)	(0.09101)	(0.24082)	(0.37311)
	(-1.71048)	(-0.15222)	(-0.97859)	(-1.08291)	(-0.10236)
D(LNEXCV(-1))	-0.095182	0.163896	-0.019148	0.084764	-0.191663

	(0.15266)	(0.11863)	(0.05315)	(0.14064)	(0.21790)
	(-0.62350)	(1.38153)	(-0.36027)	(0.60270)	(-0.87960)
D(LNEXCV(-2))	-0.071390	0.189453	0.052986	0.170483	-0.193577
	(0.12298)	(0.09557)	(0.04282)	(0.11330)	(0.17553)
	(-0.58051)	(1.98238)	(1.23754)	(1.50476)	(-1.10278)
C	0.057550	-0.011549	-0.028010	0.076531	0.127903
	(0.14477)	(0.11250)	(0.05040)	(0.13337)	(0.20663)
	(0.39754)	(-0.10266)	(-0.55574)	(0.57383)	(0.61899)
R-squared	0.569475	0.496309	0.238942	0.343188	0.483910
Adj. R-squared	0.363572	0.255414	-0.125042	0.029060	0.237085
Sum sq. resids	16.26165	9.820597	1.971077	13.80193	33.13092
S.E. equation	0.840850	0.653439	0.292744	0.774651	1.200198
F-statistic	2.765744	2.060268	0.656463	1.092510	1.960538
Log likelihood	-36.24842	-27.42269	0.680596	-33.37840	-48.70243
Akaike AIC	2.757053	2.252725	0.646823	2.593051	3.468710
Schwarz SC	3.290315	2.785987	1.180085	3.126314	4.001972
Mean dependent	0.014033	-0.003183	-0.017562	0.033899	0.056675
S.D. dependent	1.054008	0.757264	0.275996	0.786158	1.374089
Determinant Residual Covariance		0.000585			
Log Likelihood		-118.0469			
Akaike Information Criteria		10.45982			
Schwarz Criteria		13.34833			