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RICE PRODUCTION, CONSUMPTION AND ECONOMIC DEVELOPMENT IN NIGERIA

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Abstract

In recent times, rice production has become a topical issue in national discourse in Nigeria. Rice is a major staple food in all the regions of Nigeria. Over the years, Nigeria has imported rice from different countries to supplement local production, thereby putting pressure on the Nigeria foreign exchange. Since 2018, the Central Bank of Nigeria made policies aimed at curtailing the importation of some agricultural products including rice, by ordering the closure of land borders till further notice. The aim of the policy was to restrict the dumping of products such as rice into the country, which could generate an unfair competition with local rice producers. It is against this backdrop that this work investigated the effect of rice production and consumption on economic development in Nigeria, from 1986 to 2018. The data were sourced from the Central Bank of Nigeria Statistical Bulletin. To establish the empirical nexus between rice production, consumption and economic development in Nigeria, the work used the following econometrics

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tools of data analysis OLS, Unit root test, Johansen Cointegration and Vector Error Correction Model (VECM). The findings of the study prove that there is a significant relationship between rice production, consumption and economic development in Nigeria. In addition, the OLS result established that the relationship between rice import and the gross domestic product in Nigeria is statistically significant. The unit root test results justifies that all the model variables were non-stable at levels but gained stationarity after first difference. The Johansen Cointegration test empirically established that there is a long run convergence between the variables in the model, while the VECM result attested that the model variables are jointly instrumental in eliciting long-run equilibrium. From the foregoing, government is encouraged to support the mechanization and modernisation of rice production in Nigeria, including the introduction of modern equipment, pesticides and improved seedlings needed by rice farmers to increase rice production. This may be achieved through the provision of cheap credits to rice farmers.

Keywords: *real gross domestic product; rice production; consumption; economic development.*

JEL Classification: Q1

Introduction

Rice has become a topical issue in recent times in Nigeria. The Federal Government of Nigeria has recently placed embargo on its land borders with a view to restricting imports of rice through neighbouring West African countries. The belief is that restricting imports of rice will minimize unfair competition against the locally produced rice in Nigeria, encourage local producers to increase production of rice and improve their production skills among other reasons. The policy effect will ultimately enhance the welfare of Nigerians through the consumption of more healthy local rice, which is believed to be relatively fresh from the farms. It was also believed that the income of farmers will rise, consumption habits would change from foreign to local consumption and the overall effect would be an enhanced economic growth and improved welfare as well as impact on its citizens, which may technically be defined as economic development. This work attempts to see how the situation in Nigeria had been *ex-ante*. The result will provide a better basis to advise policy makers on the desirability of closure of the border or otherwise. For instance, if the country was already doing well in terms of production, marketing and consumption of the product, there would be no need for a new policy that may involve costs. Besides, there is already a debate on the desirability of the policy now given the fact that Nigeria has signed the African Continental Free Trade Area (AFCTA) agreement which encourages the free flow of goods, services and persons across Africa.

Literature Review

Rice is an agricultural cereal with the botanical name, *oryza sativa*. Rice is a staple food in Nigeria and the most widely consumed staple across the different regions in Nigeria. According to the United Nations Foods and Agriculture Organisation (FAO) data in 2017, rice was the third highest product in demand globally, behind sugarcane and maize. Nigeria is also known to be the third highest importer of rice globally. About 800 thousand metric tonnes of rice are smuggled into the country annually in addition to about 5 million metric tonnes officially imported. Local demand for rice is about 7 million tonnes annually [Russon, 2019]. Rice imports to Nigeria flow from countries as India, Thailand, Republic of Benin, Brazil and China among others.

The Food and Agricultural Organization (2017) deposed that Nigeria is the second largest producer of rice in Africa. Current production of rice in Nigeria is 3.7 million tonnes of rice annually. According to the report, 1 hectare produces 2-3 tonnes of rice. This is below the global average of about 4 tonnes and by far much lower than the average output in Egypt. Rice may be grown three times a year in Nigeria and production is largely in the hands of small holder farmers. The few large organised rice farmers that constitute about twenty per cent of the total output in Nigeria include Coscharis Group, Olam, Quarra, and Dangote among others. For instance, Coscharis as at 2019 could produce 8 metric tonnes per hectare with its hybrid variety. According to the former honourable minister of Agriculture, Chief Audu Ogbeh (2019), rice production in Nigeria between 2014 and 2018 rose by 19 per cent. He also noted that the market value of local (Nigerian) rice was 684 billion naira, making Nigeria the sixteenth largest producer of rice in the world [Odutan, 2019]. This position was corroborated by the Governor of the Central Bank of Nigeria, who described as ‘remarkable success’ that has been achieved in stimulating the production of local goods such as rice [Emefiele, 2018]. In fact,

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George (2020) has noted that production of rice in Nigeria has risen to 4.9 metric tonnes, which is an increase of about sixty per cent from the situation in 2013.

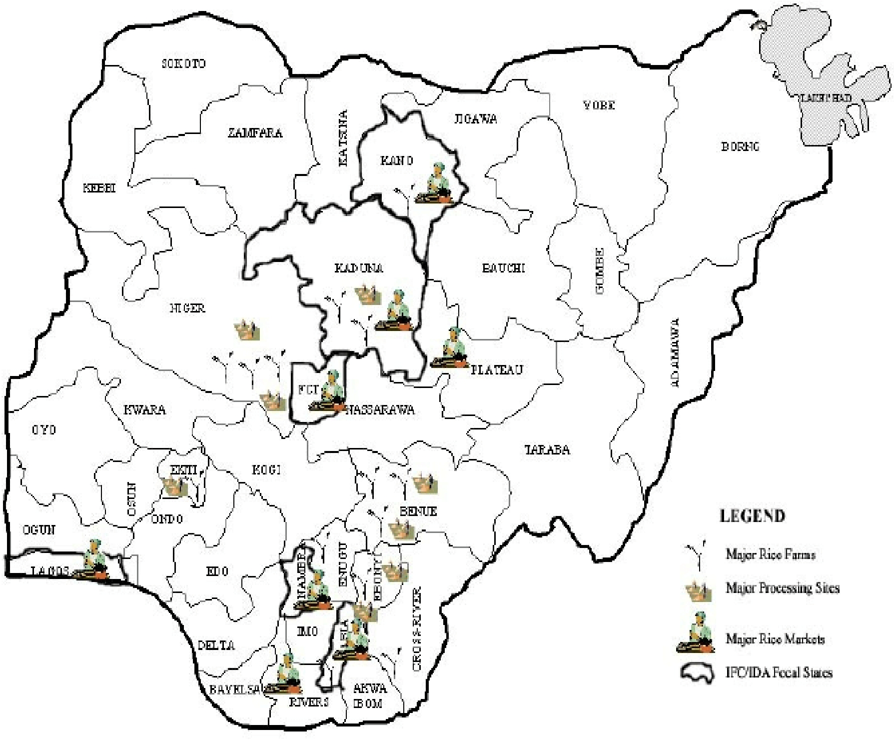

Figure 1. Map of Nigeria Showing Rice Production and Markets
Source: Phillip, Nkonya, John & Oni (2009).

Nigeria has a land mass of about 923,968 square kilometres. Out of which a total of 71.2 million hectares are available for farming. How much of this has been farmed and how has the availability and consumption of rice generated a rise in the real gross domestic product, which is the proxy for development in this discourse. The demand for rice is high among the different regions in Nigeria and has been rising with the years. In fact, Terwase and Madu (2014) noted that while the demand for rice in the local economy was high, its production was low. These scholars also observed that the import demand for rice is inelastic. The paper therefore recommended that deliberate attempts should be made by government to improve local rice production. The former Federal Minister of Agriculture, Ogbeh (cited in Russon 2019) noted that Nigeria expends about one billion naira daily in importing rice into the country. This huge sum simply creates employment in countries that export rice to Nigeria. Nigeria is the third largest importer of rice in the world [Russon 2019]. Rice is also in high demand across the world. It is the third most important staple food. About half of the population of the world eat rice as a primary source of caloric intake.

Rice is currently food for the masses in Nigeria; it is in almost every ceremony and consumed in almost every home at least once a week. Rice has a consumption rate of 32 kilogram per capita per annum [Businessday, 2018]. In many places in Southern Nigeria before the 1980s, this was not the situation. It was then eaten as a ceremonial food. Rice was eaten occasionally either at Easter, Christmas or on some special events. Even then, it was largely the local brand of rice until post-Nigerian civil war and the oil boom era, when importation of food became so pronounced. The demand for rice is high among the different regions in Nigeria and has been rising with the years. In fact, Terwase and Madu (2014) noted that while the demand for rice in the local economy was high, its production was low. These scholars also observed that the import demand for rice is inelastic. The paper therefore recommended that deliberate attempts should be made by government to improve local rice production. According to PriceWaterhouse Coopers (PWC) (2017), current mechanisation of agriculture in Nigeria is about 0.3 horse power (hp) per hectare (ha) and this could improve to 0.8 hp/ha in the next five years. Rice is relatively easy to produce and to grow.

Economic development may simply be defined as a fundamental rise of human welfare in an economy. According to Bentham (1917), it is the greatest good to the greatest number in society and to Nnoli (1981), it has to do with the inherent capacity of a people to interact with nature and their inter-human environment with a view to optimizing the use of scarce resources. To be more precise, development is a dialectical occurrence which enables men and society to relate with their biological, physical and inter-human environments, through transformation for better human conditions. In other words development in Nigeria could be defined

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as the increasing capacity to interact with nature. In this case, labour, land and rice towards enhancing human satisfaction, which is indexed in this work by rising real gross domestic product. This theory relates to the capacity to understand nature, which revolves around the study of natural science and how to transform nature for the betterment human lives (technology). According to Ake (1981), development is the ability to create and recreate out of nature for the sake of human satisfaction. This is what may be referred to as capacity model [Okowa, 1994].

Theoretical and empirical foundations of the study

The place of agriculture and food specifically to enhance human welfare has long been acknowledged. Malthus had long posited that food had great impact on development, stating explicitly that where food is insufficient to meet the population needs, the outcome could impact on development negatively. Food insufficiency could lead to ailments, wars and other situations that will reduce population size to equilibrate with the level of food supply. This is usually referred to as the Malthusian trap [Okowa 1994]. Malthus had noted that population had tendency to grow at geometric progression while food supplies grow at arithmetic progression. Otto (2008) empirically confirmed that population growth in Nigeria has been high especially in urban areas. Food supply has a nexus with human welfare or development. Lewis (1954) in his Dual Sector Model reinforced the Malthusian theory by showing that agriculture was a major source of food and raw materials for the industrial sector. A viable agricultural sector and food supply was a major key to viable industrial sector. In fact, a hungry society cannot be said to be a happy or developed society. This explains why hunger and food has always been an instrument for peace and war between societies. Nigeria will enjoy greater welfare if the production and consumption of rice increases. If local output is insufficient, rice could be imported to supplement local output. However, as more of the product is imported, unemployment will rise, so development or welfare is inversely related to importation of rice theoretically while local production is positively related to development or welfare.

Several studies had been done on the impact of agriculture on economic development and growth. There are also studies done specifically on the production or consumption of rice on economic growth and economic development. For instance, Nkoro and Otto (2018) examined the impact of Agriculture on Economic growth in Nigeria between 1980 and 2017. The study noted that agriculture exacts a positive

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and significant impact on economic growth in Nigeria. Similarly, Osabuohien, Okorie and Osabuohien (2018) examined rice production and processing in Ogun State, Nigeria. This paper used a conceptual framework built on the theory of New Institutional Economics, where Institutions, significantly influence outcomes of economic and social activities. The paper noted that in general terms institutions may be formal or informal. These institutions could include moral codes, values, norms and conducts that influence individuals and group activities. New institutional economics attempts to broaden economics to include roles that neo-classical economics might ignore [Coarse 1998]. The concept 'New Institutional Economics' was introduced by Williamson (1975). Polycarp, Yakubu, Salishu, Joshua and Ibrahim (2019) analysed producer price of rice in Nigeria. The objectives of the paper were among others to examine the behaviour of producer's price of rice and government policies in order to forecast the price of rice in Nigeria. The analytical tools were based on a three years moving average with ordinary least squares regression analysis technique. The projected price of rice from the study in 2020 was put at N1290.75 per tonne of rice. Using the Ordinary least squares technique, Afeez (2019) examined the impact of rice production on economic growth in Nigeria. The study covered the period between 1999 and 2018. The results of the study showed that local rice production had positive and significant relationship with economic growth. This study builds on Afeez (2019), by increasing the explanatory variables as well as the time span. Adedeji, Jayeola and Owolabi (2016) investigated the growth trends of rice productivity in Nigeria. The study used the Data Envelop Analysis (DEA) and attempted to identify the impact of economic reforms on efficiency in the productivity of rice at the different regions in Nigeria. The outcome of the study suggested a negative growth impact during the reform period in Nigeria as whole but increased total factor productivity in some ecological zones. The study covered 1995 to 2010. Ajala and Gana (2015) did an analysis of challenges facing rice processing in Nigeria. The study noted that rice is economically important to developing countries. The study also noted that there is growing demand for the product across the globe.

Methodology

This section of the work presented an empirical framework for data analysis of this study, which includes the model specification, scope of the data set and method of data analysis. In sum, Time series data of rice production, rice import and exchange rate from 1986-2018 were used as the explanatory variables, while the

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real gross domestic product as proxy for economic development for the same period was used as the dependent variable. The time series data were obtained from Central Bank of Nigeria Statistical Bulletin (2018). The data set covers thirty-three year period

Model Specification

The model for this study is deduced from capacity theory and modelled after Nkoro & Otto (2018) and Afeez (2019). Rice consumption in Nigeria is simply Nigerian produced rice and imported rice. A key influencing factor is exchange rate of the naira. From the foregoing the model for this paper is built as follows:

RGDP = f (RPN, RIM, EXR) 1

Where:
RGDP= Real gross domestic product
RPN = Rice production in Nigeria
RIN= Rice Importation in Nigeria
Equation (1) can be reproduced in a linear function as follows
RGDP= $\beta_0 + \beta_1$RPN $+ \beta_2$RIM + β_3EXR+Ut--------------2

While the Log-Linear model adopted for this study in other to unify the data is given below:

LOGRGDP= $\beta_0 + \beta_1$LOGRPN $+ \beta_2$LOGRIM + β_3LOGEXR+Ut

Where
β_0 =Intercept
U_t + Stochastic variable
$\beta_1 - \beta_3$ = coefficient estimates of the independent variables

The Theoretical assertions underlying the relationship between the variables in the model are as stated below. $\beta_1 > 0$, β_2 and $\beta_3 < 0$

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Results and Discussion

Table 1. Descriptive Statistics

	RGDP	RPN	RIM	EXR
M an	36646129	2281.485	1366.818	101.9097
Median	28957710	1979.000	1448.000	118.5400
Maximum	69799942	3941.000	3200.000	306.0800
Minimum	15237987	630.0000	164.0000	3.760000
Std. Dev.	19449574	850.8508	900.6854	85.89983
Skewness	0.568655	0.587722	0.238456	0.664939
Kurtosis	1.764113	2.546979	1.877726	2.906650
Jarque-Bera	3.878723	2.181982	2.044546	2.443773
Probability	0.143796	0.335884	0.359776	0.294674
Sum	1.21E+09	75289.00	45105.00	3363.020
Sum Sq. Dev.	1.21E+16	23166306	25959493	236121.0
Observations	33	33	33	33

A probe into the descriptive statistics of the time series data show the mean values of 36646129, 2281.485, 1366.818 and 101.9097 for the variables. The median values of the variables are 28957710, 1979.00, 1448.000 and 118.5400 for RGDP, RPN, RIM and EXR respectively. The range of the individual variables following the above order, which is simply define by the difference between the maximum and the minimum values are 54561755, 3311, 3036 and 302.32. In measuring the skewness of the variables, the result shows that the four variables are normally skewed. An evaluation of the series kurtosis, which explores the flatness or peakness of the data set, portrays that EXR and RPN most of the values of the individual variables lay around their mean values. Comparably, most of the series of RGDP and RIM fall below the mean value and are said to have a flat curve implying that the series is platycurtic. Finally, the Jarque-Bera statistics and their individual probability values depicts that the model data set are normally distributed.

OLS Regression Test Result

The OLS regression test result is presented below.

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LOGRGDP= 9.928931 + 0.6969445LOGRPN + 0.273829LOGRIM + 0.029198LOGEXR

P-Values= 0.0000; 0.0000; 0.0008; 0.6217

R^2 = 0.906681; F-Stat= 93.92121; Prob (F-Stat)= 0.000000

The OLS result above indicates that the coefficient of determination ($R^{2)}$ of the model is 0.906 implying that the natural logarithm of the model variables; rice production in Nigeria (RPN), rice importation (RIM) and Exchange rate (EXR) jointly accounts for over 90% of the overall variations in the annual growth of the real GDP of Nigeria and the error term account for the remainder of about 9% of other variables not inputted into the model. A further review of the result of the estimated parameters to validate the significant of the coefficient of the individual variables whether they aligned with their a-priori and statistical assertions shows that the estimated coefficient of the LOGRPN is both a-priori and statistically significant at 5% probability level, indicating that 1% change in rice production in Nigeria will elicit about 61% change in the Real GDP of Nigeria. However, the coefficient of the LOGRIM is rather not theoretically significant but is statistically significant. Finally, the estimated coefficient of the LOGEXR is neither statistically nor theoretically significant. The model F-Statistic of 93.92121 with the corresponding P-value of 0.000000 portrays that the overall model is systematically well fitted and specified.

Unit Root Test.

This study adopted the Augmented Dickey-Fuller test in evaluating the stationarity of the model variables given that time series variables are non-stable in nature.

The result of the unit root test above indicates that all the variables in the model were non-stationary at levels however they became at stationary at first difference, when their critical values became greater than the ADF- statistics at 5% probability level. Therefore, the study went on to evaluate the long-run relationship among the model variables deploying the Johansen cointegration test.

Table 1. Result of Unit Root Test

Level				First Difference			
Variables	Critical-V	ADF-Stat	P-value	Critical –V	ADF-Stat	p-Value	Order
LOGRGPD	-2.960411	-0.691648	0.8345	-2.960411	-3.158482	0.0325*	I(1)
LOGRPN	-2.960411	-1.765488	0.3899	-2.960411	-9.798263	0.0000*	I(1)
LOGRIM	-2.957110	-1.014697	0.7360	-2.960411	-4.497341	0.0012*	I(1)
LOGEXR	-2.957110	-1.672568	0.4351	-2.960411	-5.316318	0.0001*	I(1)

*indicate 5% prob Level

Johansen Cointegration Test

Following justification by ADF-Fuller unit root test that the variables in the model are all integrated of order one, thus, the need to assess the long-run relationship among the variables is expected.

Empirical evidence from the Johansen cointegration test results in table 2 above as encapsulated by Trace statistics and their corresponding P-Values indicate that there are at least three (3) cointegrating equations at 5% probability level. Similarly, the Max-Eigen Statistics and their P-Values clearly corroborate and unequivocally aligned with that. Indeed there are at least three (3) cointegrating equations among the variables in the model. The justification by both Trace statistics and Max-Eigen Statistics show that there are at least three cointegrating equations among the variables is an overt verification that the short run divergences among the variables are incidentally converged in the long run. In other words, there is an association, relationship and equilibrium in the long run between the variables in the model. Having validated the long run relationship among the variables, the Vector Error Correction Model was employed to explore the short and the long run dynamics of the model.

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Table 2. Result of Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.758847	87.19296	47.85613	0.0000
At most 1 *	0.549397	43.10087	29.79707	0.0009
At most 2 *	0.413215	18.38863	15.49471	0.0178
At most 3	0.058315	1.862635	3.841466	0.1723

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.758847	44.09209	27.58434	0.0002
At most 1 *	0.549397	24.71224	21.13162	0.0150
At most 2 *	0.413215	16.52600	14.26460	0.0216
At most 3	0.058315	1.862635	3.841466	0.1723

Result of Vector Error Correction Model Test (ECM)

A critical appraisal of VECM test result of the study show an R^2 of 0.716435; meaning that about 72% of the total variation in the GDP of Nigeria is accredited to RPN, RIM and EXR. And 29% of the remainder is explained by other factors not included in the model but have been accounted for by the error term. Furthermore, the VECM test result infers an error correction term (ECT) of -0.035753; which attest that there is a long run causality running from the independent variables to the GDP, although the causality is however not statistically significant. More importantly, the ECT indicates that the short run disequilibrium in the model is corrected by an annually adjustment speed of 3.6% in the long run, thereby necessitating equilibrium in the long run. And the Durbin-Watson statistics of 2.020828 prove that the entire model is free from autocorrelation problem.

Conclusion and Recommendations

This study assessed the effect of rice production on economic development using the real domestic product as proxy in Nigeria. The data covered the period 1986-2018. To establish the empirical nexus between rice production and economic development in Nigeria, the work used the following econometrics tools of data analysis: OLS, Unit root test, Johansen co integration and Vector Error Correction Model (VECM). The findings of the study prove that there is a significant link between rice production and economic development in Nigeria. In addition, the OLS result established that the relationship between rice import and economic development in Nigeria is statistically significant but did not align with economic theory. The unit root test results justifies that all the model variables were non-stable at levels but gained stationarity after first difference. The Johansen co integration test empirically established that there is a long run convergence between the variables in the model. However, the VECM result attested that the model variables are jointly instrumental in eliciting long-run equilibrium. From the foregoing, the government should support the mechanization of rice production in Nigeria, through policies that support the ease of access to capital equipment, pesticides and improved seedlings needed by rice farmers to increase production. Government should also encourage and persuade financial institutions to provide credit facilities to rice farmers.

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APPENDICES

year	RGDP(Million #)	RPN (1000MT)	RIM (1000MT)	EXR (N;USD)
1986	15237987.29	630	462	3.76
1987	15263929.11	1184	642	4.08
1988	16215370.93	1249	344	4.59
1989	17294675.94	1982	164	7.39
1990	19305633.16	1500	224	8.04
1991	19199060.32	1911	296	9.91
1992	19620190.34	1956	440	17.29
1993	19927993.25	1839	382	22.06
1994	19979123.44	1456	300	21.99
1995	20353202.25	1752	300	21.89
1996	21177920.91	1873	350	21.88
1997	21789097.84	1961	731	21.88
1998	22332866.9	1965	900	21.88
1999	22449409.72	1966	950	92.33
2000	23688280.33	1979	1250	101.69
2001	25267542.02	1651	1906	111.23
2002	28957710.24	1757	1897	120.57
2003	31709447.39	1870	1448	129.22
2004	35020549.16	2000	1369	132.88
2005	37474949.16	2140	1650	131.27
2006	39995504.55	2546	1500	128.65
2007	42922407.93	2008	1800	125.8
2008	46012515.31	2632	1750	118.54
2009	49856099.08	2234	1750	148.9
2010	54612264.18	2818	2400	150.29
2011	57511041.77	2906	3200	153.86

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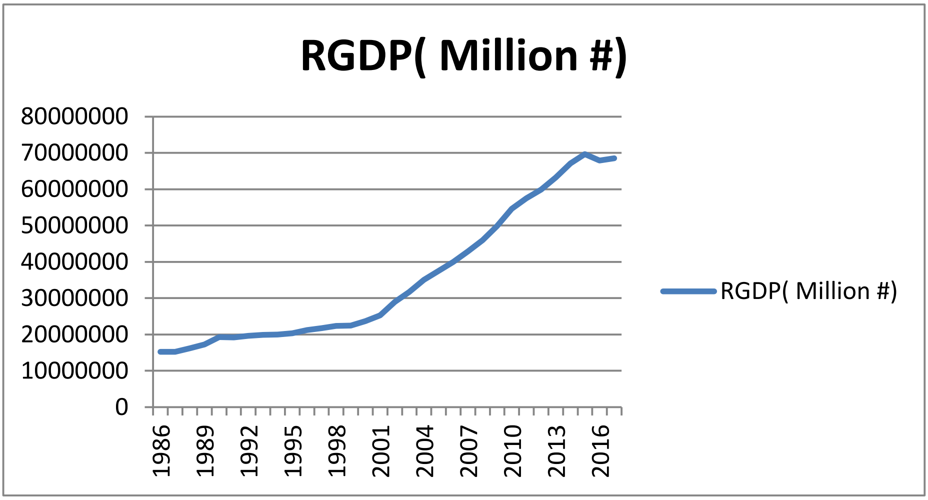
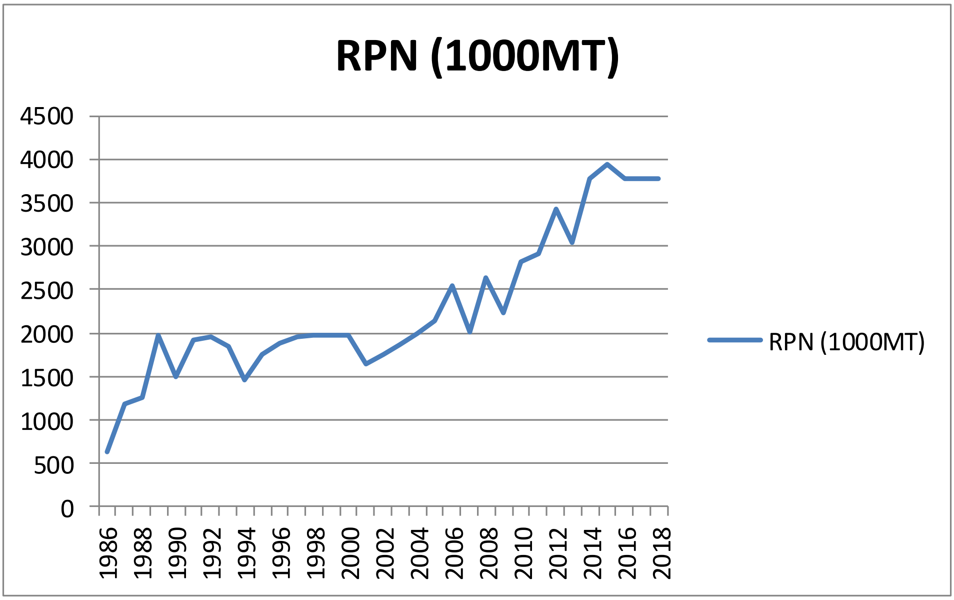
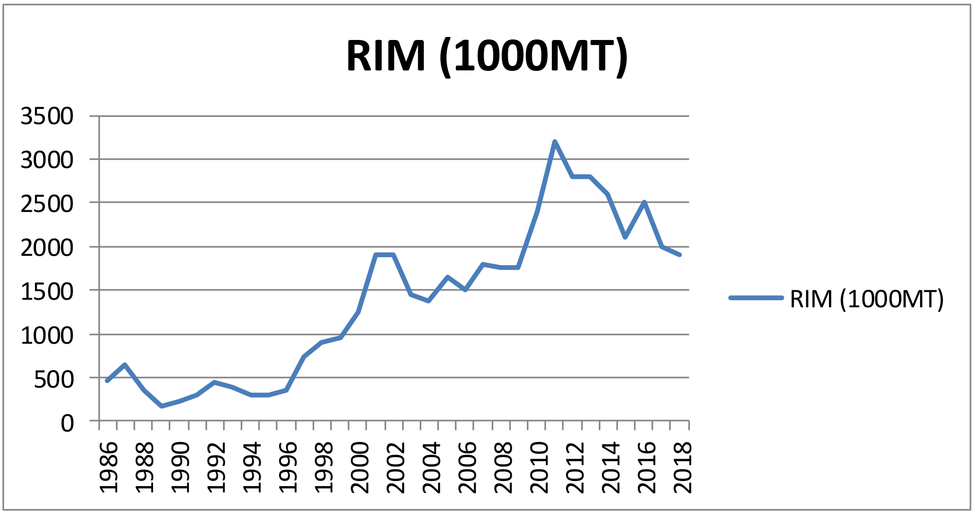
2012	59929893.04	3423	2800	157.49
2013	63218721.73	3038	2800	157.31
2014	67152785.84	3782	2600	158.55
2015	69623929.94	3941	2100	192.44
2016	67931235.93	3780	2500	253.49
2017	68490980.34	3780	2000	305.79
2018	69799941.95	3780	1900	306.08




RPN (1000MT)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
RPN (1000MT)


RIM (1000MT)
3500
3000
2500
2000
1500
1000
500
0
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
RIM (1000MT)

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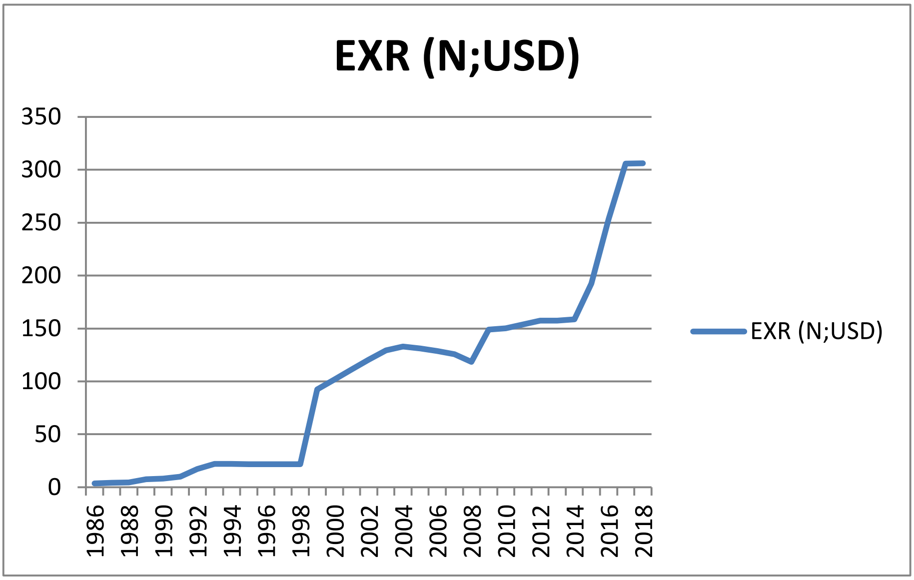

Descriptive Statistics

	RGDP	RPN	RIM	EXR
Mean	36646129	2281.485	1366.818	101.9097
Median	28957710	1979.000	1448.000	118.5400
Maximum	69799942	3941.000	3200.000	306.0800
Minimum	15237987	630.0000	164.0000	3.760000
Std. Dev.	19449574	850.8508	900.6854	85.89983
Skewness	0.568655	0.587722	0.238456	0.664939
Kurtosis	1.764113	2.546979	1.877726	2.906650
Jarque-Bera	3.878723	2.181982	2.044546	2.443773
Probability	0.143796	0.335884	0.359776	0.294674
Sum	1.21E+09	75289.00	45105.00	3363.020
Sum Sq. Dev.	1.21E+16	23166306	25959493	236121.0
Observations	33	33	33	33

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Dependent Variable: LOGRGDP
Method: Least Squares
Date: 04/17/20 Time: 08:58
Sample: 1986 2018
Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.928931	0.975382	10.17953	0.0000
LOGRPN	0.696945	0.127212	5.478596	0.0000
LOGRIM	0.273829	0.073281	3.736720	0.0008
LOGEXR	0.029198	0.058542	0.498742	0.6217

R-squared	0.906681	Mean dependent var	17.28051
Adjusted R-squared	0.897028	S.D. dependent var	0.529360
S.E. of regression	0.169868	Akaike info criterion	-0.594382
Sum squared resid	0.836796	Schwarz criterion	-0.412987
Log likelihood	13.80730	Hannan-Quinn criter.	-0.533348
F-statistic	93.92121	Durbin-Watson stat	0.899683
Prob(F-statistic)	0.000000		

Null Hypothesis: LOGRGDP has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.691648	0.8345
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOGRGDP)
Method: Least Squares
Date: 04/12/20 Time: 11:39
Sample (adjusted): 1988 2018
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGRGDP(-1)	-0.008013	0.011585	-0.691648	0.4949
D(LOGRGDP(-1))	0.519212	0.159612	3.252971	0.0030
C	0.162324	0.199404	0.814048	0.4225

R-squared	0.275612	Mean dependent var	0.049037
Adjusted R-squared	0.223870	S.D. dependent var	0.036430
S.E. of regression	0.032094	Akaike info criterion	-3.948532
Sum squared resid	0.028841	Schwarz criterion	-3.809759
Log likelihood	64.20224	Hannan-Quinn criter.	-3.903295
F-statistic	5.326665	Durbin-Watson stat	2.026173
Prob(F-statistic)	0.010955		

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Null Hypothesis: D(LOGRGDP) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.158482	0.0325
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOGRGDP,2)
Method: Least Squares
Date: 04/12/20 Time: 11:40
Sample (adjusted): 1988 2018
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGRGDP(-1))	-0.495263	0.156804	-3.158482	0.0037
C	0.024567	0.009509	2.583537	0.0151

R-squared	0.255953	Mean dependent var	0.000556
Adjusted R-squared	0.230296	S.D. dependent var	0.036251
S.E. of regression	0.031804	Akaike info criterion	-3.996107
Sum squared resid	0.029333	Schwarz criterion	-3.903592
Log likelihood	63.93966	Hannan-Quinn criter.	-3.965949
F-statistic	9.976011	Durbin-Watson stat	1.976619
Prob(F-statistic)	0.003689		

Null Hypothesis: LOGRPN has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.765488	0.3899
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOGRPN)
Method: Least Squares
Date: 04/12/20 Time: 11:41
Sample (adjusted): 1988 2018
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGRPN(-1)	-0.143492	0.081276	-1.765488	0.0884
D(LOGRPN(-1))	-0.367514	0.134801	-2.726351	0.0109
C	1.161143	0.625005	1.857813	0.0737

R-squared	0.274169	Mean dependent var	0.037446
Adjusted R-squared	0.222324	S.D. dependent var	0.162513
S.E. of regression	0.143314	Akaike info criterion	-0.955797
Sum squared resid	0.575086	Schwarz criterion	-0.817024
Log likelihood	17.81485	Hannan-Quinn criter.	-0.910560
F-statistic	5.288232	Durbin-Watson stat	1.833336
Prob(F-statistic)	0.011264		

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Null Hypothesis: D(LOGRPN) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-9.798263	0.0000
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOGRPN,2)
Method: Least Squares
Date: 04/12/20 Time: 11:42
Sample (adjusted): 1988 2018
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGRPN(-1))	-1.368168	0.139634	-9.798263	0.0000
C	0.058726	0.027858	2.108070	0.0438

R-squared	0.768011	Mean dependent var	-0.020353
Adjusted R-squared	0.760011	S.D. dependent var	0.303034
S.E. of regression	0.148452	Akaike info criterion	-0.914765
Sum squared resid	0.639105	Schwarz criterion	-0.822250
Log likelihood	16.17886	Hannan-Quinn criter.	-0.884607
F-statistic	96.00596	Durbin-Watson stat	1.972192
Prob(F-statistic)	0.000000		

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Null Hypothesis: LOGRIM has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.014697	0.7360
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOGRIM)
Method: Least Squares
Date: 04/17/20 Time: 09:04
Sample (adjusted): 1987 2018
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGRIM(-1)	-0.061446	0.060556	-1.014697	0.3184
C	0.468062	0.421033	1.111698	0.2751

R-squared	0.033182	Mean dependent var	0.044189
Adjusted R-squared	0.000954	S.D. dependent var	0.297746
S.E. of regression	0.297604	Akaike info criterion	0.474356
Sum squared resid	2.657046	Schwarz criterion	0.565965
Log likelihood	-5.589700	Hannan-Quinn criter.	0.504722
F-statistic	1.029610	Durbin-Watson stat	1.540244
Prob(F-statistic)	0.318364		

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Null Hypothesis: D(LOGRIM) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.497341	0.0012
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOGRIM,2)
Method: Least Squares
Date: 04/17/20 Time: 09:05
Sample (adjusted): 1988 2018
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGRIM(-1))	-0.807960	0.179653	-4.497341	0.0001
C	0.025923	0.054070	0.479434	0.6352

R-squared	0.410881	Mean dependent var	-0.012268
Adjusted R-squared	0.390567	S.D. dependent var	0.380849
S.E. of regression	0.297315	Akaike info criterion	0.474289
Sum squared resid	2.563483	Schwarz criterion	0.566804
Log likelihood	-5.351478	Hannan-Quinn criter.	0.504447
F-statistic	20.22607	Durbin-Watson stat	1.507778
Prob(F-statistic)	0.000102		

Null Hypothesis: LOGEXR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.672568	0.4351
Test critical values:	1% level	-3.653730	
	5% level	-2.957110	
	10% level	-2.617434	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOGEXR)
Method: Least Squares
Date: 04/17/20 Time: 09:06
Sample (adjusted): 1987 2018
Included observations: 32 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGEXR(-1)	-0.059901	0.035814	-1.672568	0.1048
C	0.374298	0.149354	2.506106	0.0179

R-squared	0.085296	Mean dependent var	0.137482
Adjusted R-squared	0.054806	S.D. dependent var	0.276583
S.E. of regression	0.268897	Akaike info criterion	0.271487
Sum squared resid	2.169173	Schwarz criterion	0.363096
Log likelihood	-2.343794	Hannan-Quinn criter.	0.301853
F-statistic	2.797485	Durbin-Watson stat	2.031313
Prob(F-statistic)	0.104811		

Null Hypothesis: D(LOGEXR) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic - based on SIC, maxlag=8)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.316318	0.0001
Test critical values:	1% level	-3.661661	
	5% level	-2.960411	
	10% level	-2.619160	

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

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LOGEXR,2)
Method: Least Squares
Date: 04/17/20 Time: 09:06
Sample (adjusted): 1988 2018
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGEXR(-1))	-0.990529	0.186319	-5.316318	0.0000
C	0.137938	0.057732	2.389309	0.0236

R-squared	0.493567	Mean dependent var	-0.002604
Adjusted R-squared	0.476104	S.D. dependent var	0.394795
S.E. of regression	0.285755	Akaike info criterion	0.394977
Sum squared resid	2.368022	Schwarz criterion	0.487492
Log likelihood	-4.122144	Hannan-Quinn criter.	0.425135
F-statistic	28.26324	Durbin-Watson stat	1.991403
Prob(F-statistic)	0.000011		

Johansen Cointegration Test Result

Date: 04/17/20 Time: 09:09
Sample (adjusted): 1988 2018
Included observations: 31 after adjustments
Trend assumption: Linear deterministic trend
Series: LOGRGDP LOGRPN LOGRIM LOGEXR
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 *	0.758847	87.19296	47.85613	0.0000
At most 1 *	0.549397	43.10087	29.79707	0.0009
At most 2 *	0.413215	18.38863	15.49471	0.0178
At most 3	0.058315	1.862635	3.841466	0.1723

Trace test indicates 3 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 *	0.758847	44.09209	27.58434	0.0002
At most 1 *	0.549397	24.71224	21.13162	0.0150
At most 2 *	0.413215	16.52600	14.26460	0.0216
At most 3	0.058315	1.862635	3.841466	0.1723

Max-eigenvalue test indicates 3 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):

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LOGRGDP	LOGRPN	LOGRIM	LOGEXR
2.366469	-4.770845	1.989376	-1.264009
9.119961	-8.035232	-2.946044	0.203742
-0.995813	5.601407	1.209930	-2.029010
1.463379	0.687043	0.704379	-0.419271

Unrestricted Adjustment Coefficients (alpha):

D(LOGRGDP)	0.009397	-0.005603	-0.015647	-0.002053
D(LOGRPN)	0.091250	0.061389	0.015249	-0.008163
D(LOGRIM)	-0.202987	0.037669	-0.022186	-0.034890
D(LOGEXR)	0.041144	-0.095803	0.123088	-0.031851

1 Cointegrating Equation(s): Log likelihood 101.1846

Normalized cointegrating coefficients (standard error in parentheses)

LOGRGDP	LOGRPN	LOGRIM	LOGEXR
1.000000	-2.016018	0.840651	-0.534133
	(0.27248)	(0.14427)	(0.11603)

Adjustment coefficients (standard error in parentheses)

D(LOGRGDP)	0.022237
	(0.01296)
D(LOGRPN)	0.215941
	(0.05011)
D(LOGRIM)	-0.480363
	(0.09195)
D(LOGEXR)	0.097365
	(0.12638)

2 Cointegrating Equation(s): Log likelihood 113.5407

Normalized cointegrating coefficients (standard error in parentheses)

LOGRGDP	LOGRPN	LOGRIM	LOGEXR
1.000000	0.000000	-1.226392	0.454326
		(0.15476)	(0.10764)

0.000000	1.000000	-1.025310	0.490303
		(0.13770)	(0.09578)

Adjustment coefficients (standard error in parentheses)

D(LOGRGDP)	-0.028862	0.000192
	(0.05052)	(0.05010)
D(LOGRPN)	0.775806	-0.928615
	(0.16257)	(0.16123)
D(LOGRIM)	-0.136825	0.665743
	(0.35914)	(0.35620)
D(LOGEXR)	-0.776357	0.573512
	(0.46969)	(0.46585)

3 Cointegrating Equation(s): Log likelihood 121.8037

Normalized cointegrating coefficients (standard error in parentheses)

LOGRGDP	LOGRPN	LOGRIM	LOGEXR
1.000000	0.000000	0.000000	-0.470620
			(0.04690)
0.000000	1.000000	0.000000	-0.282988
			(0.03667)
0.000000	0.000000	1.000000	-0.754201
			(0.04645)

Adjustment coefficients (standard error in parentheses)

D(LOGRGDP)	-0.013281	-0.087455	0.016268
	(0.04125)	(0.04743)	(0.01635)
D(LOGRPN)	0.760622	-0.843201	0.019126
	(0.16090)	(0.18502)	(0.06377)
D(LOGRIM)	-0.114732	0.541472	-0.541635
	(0.35869)	(0.41247)	(0.14216)
D(LOGEXR)	-0.898930	1.262979	0.513019
	(0.41070)	(0.47228)	(0.16278)

Vector Error Correction Estimates
Date: 04/17/20 Time: 09:11

Sample (adjusted): 1989 2018
Included observations: 30 after adjustments
Standard errors in ( ) & t-statistics in [ ]

CointegratingEq:	CointEq1	CointEq2	CointEq3	
LOGRGDP(-1)	1.000000	0.000000	0.000000	
LOGRPN(-1)	0.000000	1.000000	0.000000	
LOGRIM(-1)	0.000000	0.000000	1.000000	
LOGEXR(-1)	-0.476898	-0.283695	-0.797996	
	(0.05532)	(0.03745)	(0.05304)	
	[-8.61999]	[-7.57603]	[-15.0442]	
C	-15.33618	-6.532738	-3.645619	
Error Correction:	**D(LOGRGDP)**	**D(LOGRPN)**	**D(LOGRIM)**	**D(LOGEXR)**
CointEq1	-0.035753	0.871644	-0.297148	-0.610408
	(0.06529)	(0.24000)	(0.65377)	(0.67436)
	[-0.54759]	[3.63178]	[-0.45452]	[-0.90516]
CointEq2	-0.119239	-1.214745	0.673133	1.111716
	(0.07685)	(0.28251)	(0.76954)	(0.79378)
	[-1.55154]	[-4.29990]	[0.87472]	[1.40054]
CointEq3	0.061121	0.125865	-0.451070	0.499313
	(0.02723)	(0.10010)	(0.27266)	(0.28125)
	[2.24462]	[1.25744]	[-1.65433]	[1.77534]
D(LOGRGDP(-1))	0.010119	-1.331968	1.549203	0.219214
	(0.22285)	(0.81918)	(2.23142)	(2.30172)
	[0.04541]	[-1.62598]	[0.69427]	[0.09524]
D(LOGRGDP(-2))	-0.069507	-0.705135	0.938891	1.218483
	(0.17145)	(0.63024)	(1.71675)	(1.77083)
	[-0.40541]	[-1.11884]	[0.54690]	[0.68809]

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D(LOGRPN(-1))	0.100211	0.015687	0.262017	-0.829845
	(0.05808)	(0.21351)	(0.58159)	(0.59991)
	[1.72534]	[0.07347]	[0.45052]	[-1.38328]
D(LOGRPN(-2))	-0.011689	0.059423	0.183620	-0.359656
	(0.03867)	(0.14215)	(0.38722)	(0.39942)
	[-0.30226]	[0.41802]	[0.47420]	[-0.90044]
D(LOGRIM(-1))	-0.032372	0.070358	0.467866	-0.258995
	(0.02196)	(0.08071)	(0.21985)	(0.22678)
	[-1.47442]	[0.87174]	[2.12810]	[-1.14207]
D(LOGRIM(-2))	-0.050654	-0.119059	-0.088455	0.196675
	(0.02580)	(0.09484)	(0.25835)	(0.26649)
	[-1.96331]	[-1.25535]	[-0.34239]	[0.73803]
D(LOGEXR(-1))	0.006957	0.108230	0.004061	0.009721
	(0.02209)	(0.08121)	(0.22121)	(0.22818)
	[0.31491]	[1.33274]	[0.01836]	[0.04260]
D(LOGEXR(-2))	-0.013814	-0.055483	0.017233	-0.019459
	(0.02070)	(0.07610)	(0.20730)	(0.21383)
	[-0.66728]	[-0.72907]	[0.08313]	[-0.09100]
C	0.053448	0.130791	-0.104187	0.121984
	(0.01467)	(0.05391)	(0.14685)	(0.15147)
	[3.64458]	[2.42618]	[-0.70950]	[0.80533]
R-squared	0.716435	0.808044	0.490868	0.493051
Adj. R-squared	0.543145	0.690737	0.179731	0.183249
Sum sq. resids	0.011252	0.152039	1.128137	1.200330
S.E. equation	0.025002	0.091905	0.250348	0.258234
F-statistic	4.134321	6.888313	1.577661	1.591505
Log likelihood	75.75859	36.70410	6.641287	5.710855
Akaike AIC	-4.250573	-1.646940	0.357248	0.419276
Schwarz SC	-3.690094	-1.086461	0.917726	0.979755
Mean dependent	0.048656	0.036913	0.056966	0.139999
S.D. dependent	0.036990	0.165264	0.276418	0.285739

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Determinant resid covariance (dof adj.)	1.42E-08
Determinant resid covariance	1.84E-09
Log likelihood	131.4088
Akaike information criterion	-4.760586
Schwarz criterion	-1.958192

System: UNTITLED
Estimation Method: Least Squares
Date: 04/17/20 Time: 09:12
Sample: 1989 2018
Included observations: 30
Total system (balanced) observations 120

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.035753	0.065290	-0.547594	0.5857
C(2)	-0.119239	0.076852	-1.551544	0.1252
C(3)	0.061121	0.027230	2.244620	0.0279
C(4)	0.010119	0.222847	0.045410	0.9639
C(5)	-0.069507	0.171448	-0.405410	0.6864
C(6)	0.100211	0.058082	1.725337	0.0888
C(7)	-0.011689	0.038671	-0.302261	0.7633
C(8)	-0.032372	0.021956	-1.474420	0.1447
C(9)	-0.050654	0.025801	-1.963309	0.0535
C(10)	0.006957	0.022092	0.314911	0.7537
C(11)	-0.013814	0.020702	-0.667284	0.5067
C(12)	0.053448	0.014665	3.644584	0.0005
C(13)	0.871644	0.240005	3.631776	0.0005
C(14)	-1.214745	0.282505	-4.299903	0.0001
C(15)	0.125865	0.100096	1.257440	0.2127
C(16)	-1.331968	0.819178	-1.625981	0.1083
C(17)	-0.705135	0.630237	-1.118841	0.2669
C(18)	0.015687	0.213507	0.073471	0.9416
C(19)	0.059423	0.142154	0.418020	0.6772
C(20)	0.070358	0.080709	0.871744	0.3862
C(21)	-0.119059	0.094842	-1.255347	0.2134

C(22)	0.108230	0.081209	1.332743	0.1868
C(23)	-0.055483	0.076101	-0.729071	0.4683
C(24)	0.130791	0.053908	2.426178	0.0178
C(25)	-0.297148	0.653768	-0.454516	0.6508
C(26)	0.673133	0.769538	0.874723	0.3846
C(27)	-0.451070	0.272660	-1.654331	0.1024
C(28)	1.549203	2.231425	0.694267	0.4897
C(29)	0.938891	1.716752	0.546900	0.5861
C(30)	0.262017	0.581590	0.450518	0.6537
C(31)	0.183620	0.387223	0.474196	0.6368
C(32)	0.467866	0.219851	2.128103	0.0368
C(33)	-0.088455	0.258347	-0.342389	0.7331
C(34)	0.004061	0.221211	0.018359	0.9854
C(35)	0.017233	0.207298	0.083133	0.9340
C(36)	-0.104187	0.146845	-0.709505	0.4803
C(37)	-0.610408	0.674362	-0.905163	0.3684
C(38)	1.111716	0.793779	1.400536	0.1656
C(39)	0.499313	0.281249	1.775341	0.0801
C(40)	0.219214	2.301715	0.095239	0.9244
C(41)	1.218483	1.770830	0.688086	0.4936
C(42)	-0.829845	0.599910	-1.383282	0.1709
C(43)	-0.359656	0.399421	-0.900442	0.3709
C(44)	-0.258995	0.226776	-1.142074	0.2572
C(45)	0.196675	0.266485	0.738035	0.4629
C(46)	0.009721	0.228179	0.042602	0.9661
C(47)	-0.019459	0.213828	-0.091001	0.9277
C(48)	0.121984	0.151471	0.805330	0.4233

Determinant residual covariance	1.84E-09

Equation: D(LOGRGDP) = C(1)*(LOGRGDP(-1) - 0.476897780174
LOGEXR(-1) - 15.336176739) + C(2)(LOGRPN(-1) -
0.283694509108*LOGEXR(-1) - 6.53273767835) + C(3)*(LOGRIM(-1)
- 0.797995566772*LOGEXR(-1) - 3.64561858053) + C(4)
*D(LOGRGDP(-1)) + C(5)*D(LOGRGDP(-2)) + C(6)*D(LOGRPN(-1)) +
C(7)*D(LOGRPN(-2)) + C(8)*D(LOGRIM(-1)) + C(9)*D(LOGRIM(-2)) +
C(10)*D(LOGEXR(-1)) + C(11)*D(LOGEXR(-2)) + C(12)
Observations: 30

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R-squared	0.716435	Mean dependent var	0.048656
Adjusted R-squared	0.543145	S.D. dependent var	0.036990
S.E. of regression	0.025002	Sum squared resid	0.011252
Durbin-Watson stat	2.020828		

Equation: D(LOGRPN) = C(13)*(LOGRGDP(-1) - 0.476897780174 *LOGEXR(-1) - 15.336176739) + C(14)*(LOGRPN(-1) - 0.283694509108*LOGEXR(-1) - 6.53273767835) + C(15)*(LOGRIM(-1) - 0.797995566772*LOGEXR(-1) - 3.64561858053) + C(16) *D(LOGRGDP(-1)) + C(17)*D(LOGRGDP(-2)) + C(18)*D(LOGRPN(-1)) + C(19)*D(LOGRPN(-2)) + C(20)*D(LOGRIM(-1)) + C(21)*D(LOGRIM(-2)) + C(22)*D(LOGEXR(-1)) + C(23)*D(LOGEXR(-2)) + C(24)

Observations: 30

R-squared	0.808044	Mean dependent var	0.036913
Adjusted R-squared	0.690737	S.D. dependent var	0.165264
S.E. of regression	0.091905	Sum squared resid	0.152039
Durbin-Watson stat	1.764092		

Equation: D(LOGRIM) = C(25)*(LOGRGDP(-1) - 0.476897780174 *LOGEXR(-1) - 15.336176739) + C(26)*(LOGRPN(-1) - 0.283694509108*LOGEXR(-1) - 6.53273767835) + C(27)*(LOGRIM(-1) - 0.797995566772*LOGEXR(-1) - 3.64561858053) + C(28) *D(LOGRGDP(-1)) + C(29)*D(LOGRGDP(-2)) + C(30)*D(LOGRPN(-1)) + C(31)*D(LOGRPN(-2)) + C(32)*D(LOGRIM(-1)) + C(33)*D(LOGRIM(-2)) + C(34)*D(LOGEXR(-1)) + C(35)*D(LOGEXR(-2)) + C(36)

Observations: 30

R-squared	0.490868	Mean dependent var	0.056966
Adjusted R-squared	0.179731	S.D. dependent var	0.276418
S.E. of regression	0.250348	Sum squared resid	1.128137
Durbin-Watson stat	1.891354		

Equation: D(LOGEXR) = C(37)*(LOGRGDP(-1) - 0.476897780174 *LOGEXR(-1) - 15.336176739) + C(38)*(LOGRPN(-1) - 0.283694509108*LOGEXR(-1) - 6.53273767835) + C(39)*(LOGRIM(-1) - 0.797995566772*LOGEXR(-1) - 3.64561858053) + C(40) *D(LOGRGDP(-1)) + C(41)*D(LOGRGDP(-2)) + C(42)*D(LOGRPN(-1)) + C(43)*D(LOGRPN(-2)) + C(44)*D(LOGRIM(-1)) + C(45)*D(LOGRIM(-2)) + C(46)*D(LOGEXR(-1)) + C(47)*D(LOGEXR(-2)) + C(48)

Observations: 30

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R-squared	0.493051	Mean dependent var	0.139999
Adjusted R-squared	0.183249	S.D. dependent var	0.285739
S.E. of regression	0.258234	Sum squared resid	1.200330
Durbin-Watson stat	1.992362		