European Journal of Business and Management
ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)
Vol.7, No.4, 2015

Determinants of India's Agricultural Export

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Abstract
In the past decade, India has emerged as a major agricultural exporter, with exports climbing from just over $5 billion in 2003 to a record of more than $39 billion in 2013. India became the world's seventh-largest exporter of agricultural products in 2013, surpassing Australia. In terms of net exports, India is now the world's sixth-largest net exporter, with net exports doubles those of the EU-28. The study found that there exist a long run cointegration relationship between agricultural exports of India and Real effective exchange rate (REER), demand for agricultural products, agricultural production and India's per capita income. All these variables Granger cause agricultural export in the short run as well as in the long run.
Keywords: Agricultural Exports, REER, World import of agricultural goods, agricultural production, per capita income.
JEL: F14, Q170.

1. Introduction

Agricultural sector has been the most crucial sector of Indian economy, which contributes about 12.3 percent of Gross Domestic Product (GDP) and provides employment to about 58 percent of total population. It has been supporting the Indian economy in different ways. Agricultural export has been the bone of India's export efforts and it was expected that its contribution would increase in future to propel India's export growth. Traditionally, this sector contributed about 10 percent to India's export (merchandise export). Agricultural exports play a significant role in employment generation both directly and indirectly particularly in rural areas. The low import intensity further enhances the significance of agricultural exports. It contributes to increase in income of rural masses, particularly landless labourers, and small and marginal farmers and improve the quality of the life of rural masses.

India has great potential to export agricultural products. The export growth depends not only on domestic production and distribution situation, but also on number of external factors like world economic scenario, prices of Indian exports in relation to world prices, exchange rates, and inflation rates in competing countries and taxes and subsidies on exports.

In order to stimulate industrial growth by supplying agricultural goods at reasonable prices, the government kept control on export of most of the agricultural products until the implementation of new economic policy. The reasons behind this control have been that the export may create shortage in domestic market that may raise the price level and would adversely affect the industrial growth too. The rise in price would adversely affect the growth of heavy industries being established under import substitution industrialization (ISI) strategies. But with the liberalization of the economy, policy shifted towards achieving twin objectives of India's trade policy on agricultural items is guided by the twin objectives of ensuring food security and building export markets for enhancing the income of farmers, depending on domestic availability.

In the past decade, India has emerged as a major agricultural exporter, with exports climbing from just over $5 billion in 2003 to a record of more than $39 billion in 2013. India became the world's seventh-largest exporter of agricultural products in 2013, surpassing Australia. In terms of net exports, India is now the world's sixth-largest net exporter, with net exports doubles those of the EU-28. The Indian government's support for both production and exports has contributed to the rapid growth in shipments, which are increasingly destined for developing nations including least-developed nations (as classified by the United Nations).

In this perspective, the paper attempts to identify the factors have affected the growth of agricultural export of India. The paper is organized as follows. In next section, a brief overview of agricultural exports has been given. This is followed by model specification and methodology to examine the existence of long run relationship between India's agricultural exports and different variables. Section four covers analysis of empirical result. In final section the paper concludes the main findings of research.

2. Growth and Performance (Overview of Agricultural Export)

Agriculture sector has achieved remarkable growth in the post green revolution period. The country which faced a serious food shortage has now started generating exportable surpluses. The value of agricultural exports increased from Rs. 2057 crores ($2601 million) in 1980-81 to Rs. 6317 crores ($3521 million) in 1990-91 at an annual compound rate of 3 percent per annum. The growth rate further accelerated during the reform period.

From 1990-91 to 2000-01, the agricultural export increased at the rate of 5.9 percent per annum and reached to Rs. 28582 crores ($6256 million) in 2000-01. In 2013-14, the value of agricultural exports increased to Rs. 260906 crores ($43128 million) increasing at the rate of 16 percent per annum.

In 1980-81, the share of agricultural exports in total export was 30.6 percent. Due to slow growth during the 1980s, its share came down to 17.9 per cent in 1991-92. During the first four years of reforms the share of agricultural exports increased by nearly 3 per cent to reach 20.7 percent in 1996-97.Thereafter the share continuously declined. The decline in the share does not mean that the agricultural export was very throughout the period. During 1996-97 to 2000-01, the share declined due to negative growth of agricultural exports. In the new millennium, agricultural exports regained momentum. However,its share declined because of even higher rate of growth of non agricultural exports, particularly of manufacturing export.

During the period, the relative importance of different commodities of India's agricultural and allied export items changed considerably. For example, the share of tea and mate decreased from 20 percent in 1980-81 to about 2 percent in 2013-14. The share of coffee fell from 10 percent to 2 percent in corresponding period. Similarly, the share of tobacco and cashew and kernals also declined from about 6 percent to 2 percent in the same period. As against this, the share of rice, spices and meat has substantially increased. India has become a very important player on the global market, especially for rice, cotton, sugar, and beef (buffalo). In addition to these products, India has also become a sizeable exporter of soybean meal, guar gum, corn, and wheat, as well as a diverse range of other products.

The credit for this shift within the traditional item category goes to economic reform measures. A number of restrictions like export prohibitions, announcement of minimum export price, fixing of rigid ceilings for maximum possible export quantities and requirement of export licensing for certain type of agricultural exports that were earlier in vogue, have been removed under the new policy. Not only this a number of facilities and export promotion measures that were limited to a few agricultural commodities only have been extended to all commodities in this group. It is precisely these factors that might have resulted in the structural shift whereby the export of high value added agricultural products have started recording high growth rates.

Although the United States has been the largest market for India's agricultural exports in the past two years (primarily guar gum), nearly all other large markets for India are developing countries. After the United States, the countries that imported at least $1 billion worth of products from India in 2013 were China, Iran, Vietnam, Bangladesh, Saudi Arabia, United Arab Emirates, Indonesia, Malaysia, and Pakistan. In total, 79 percent of India's exports went to developing markets. Exports have been particularly strong to least developed countries, with India becoming the top supplier in 2013 with $5.2 billion and with a rapidly growing agricultural trade surplus with these nations of $2.4 billion.

3. Literature Review

The increasing popularity of the policy of openness to the external world—or more specifically the impact of international trade on the development process—has led to numerous theoretical and empirical studies. The deteriorating terms of trade for primary products in the post World War II led to development of pessimistic opinion for developing nations. Since the absorptive capacity of the world economy to accommodate imports of primary products from developing economies is not sufficient, the terms of trade for these economies deteriorated. Again, the economic crisis of the 1980s, the sluggish world economy and the continuing depression of primary product prices revived export pessimism. The export performance of developing countries (growth rate of world trade in primary products) depended on the growth rate of industrial production in the developed countries. Reason being that the demand for primary products of developing countries is inelastic. According to Thomas and Nash (1991), the demand elasticity for agricultural products may be inelastic for developing countries as a whole, but this may not be true for an individual economy. Thus an individual country can increase export by making price competitive through devaluation and other measures.

However, the success of East Asian economies over last thirty years or so, and more recently, other regions like Chile which has been credited for phenomenal economic transformation under export oriented policy (Elbadawi, 1998) changed the opinion of developing economies towards this policy. Balassa (1990) and Edwards (1993) postulated that there was agreement among a large segment of the economists that countries that have relied on outward oriented development strategies have done better over the medium and long run than the inward-looking ones. Number of empirical studies has also been done on behavior of export of agricultural goods and found that exports in least developed countries (LDCs) are more responsive to price variables (Balassa, 1990; Tshibaka,1997; Gerrard et al., 1994). Amin (1996) estimates the effects of exchange rate policies on prices of export crops and on Cameroon's agricultural export competitiveness and found that a 10% depreciation of REER stimulates about 1.0% increase of cocoa relative to the price of tradeables. (Tshibaka, 1997) found that external factors led to decrease in export earning and real producer income of Cameroon. With respect to Nigeria, Uganda and other countries, Adubi and Okunmadewa (1996), Kyle and Swinnen (1994), Donges and Riedel (1977), Elbadawi (1998), and Kwanashie et al. (1997) showed large significant influence of

REER on agricultural exports. But the first authors demonstrated that the exchange rate's volatility has a stronger negative effect on exports in Nigeria. Many studies have found significant role of price variable in export growth Lukonga (1994), Mundlak and Larson (1992).

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 incomeand price elasticities of demand are low and almost certainly less than unity. Ghura andGrennes (1994), however, found that primary exports are responsive to world real income. This view issupported by other works (Love, 1982; Donges and Riedel, 1977; Balassa, 1990).

4. Model Specification, Data and Methodology

Over the last decade, growth rate of export of India's agricultural goods has been very fast. This period also correspond to depreciation of Indian currency against major currencies,increase in world import of agricultural goods, increase in India's per capita income and index of India's agricultural production.

Real effective exchange rate (REER) is one of the factors that affect the export growth of a country. Depreciation of exchange rate makes the exportables cheaper in terms of foreign currency in the foreign market. This increases the demand for the products in the foreign market. At the same time, depreciation also makes the exportables more profitable for the exporters as despite decrease in price in foreign currency; it is higher than earlier in domestic currency.Therefore, the exporters would be willing to supply more of the goods with depreciation of the country's currency. Hence, we may expect negative relationship between REER and volume of exports.

Per capita income of a country is another factor that may affect a country's export. Increase in per capita income increases the demand for product. This may reduce the exportable surplus and hence export capacity of the country. Hence we may expect a negative relationship between per capita income of a country and agricultural export.

The capacity of a country to export goods depends upon amount of production. Higher the amount of production of agricultural goods, the country's capacity to export will be more. Hence we may expect a positive relationship between index of agricultural production and country's agricultural export.

In addition to these variables, world demand for agricultural goods has also been included in the model. The amount of world import reflects the demand for agricultural goods.

Xt = f (REERt, MWt, Pt, PCIt) ---------- (1)

Where,

X refers to amount of agricultural exports from India.

REER refers to real effective exchange rate of Indian currency.

MW is amount of world import of agricultural goods.

P is index of agricultural production

PCI measures per capitaincome of India.

t measures the time period.

The data on these variables have been taken from FAOSTAT, UNCTADSTAT published by United Nations; and World Development Indicators published by World Bank. The study covers the period from 1980 to 2011.

Since the empirical analysis is based on annual time series data for the period 1980-2011, Augmented Dicky- Fuller test (ADF-test) and Philips-perron test (PP test) has been applied to check the problem of non stationarity nature of variables.Application of ordinary least square (OLS) method or cointegration method will depend upon nature of data. Pesaran's et al (2001) bound test method will be used to estimate long run relationship between the variables if all the variables are not found to be stationary.

If all the variables under consideration were found to be stationary at level, then we may apply ordinary least square method to estimate the relationship among the variables. However, if the variables are not found to be stationary, but are integrated of the same order, then we may still have a long run relationship if there exists a co-integration among these variables. For the purpose, following unrestricted error correction model (UECM) as in equation 2 can be estimated for bounds test procedure. The ordinary least square (OLS) method is used for estimation.

$$\Delta lX_t = \alpha_0 + \sum_{i=1}^{n} \alpha_{1i} \Delta lX_{t-i} + \sum_{i=0}^{n} \alpha_{2i} \Delta lREER_{t-i} + \sum_{i=0}^{n} \alpha_{3i} \Delta lMW_{t-i} + \sum_{i=0}^{n} \alpha_{4i} \Delta lP_{t-i} + \sum_{i=0}^{n} \alpha_{5i} PCI_{t-i}$$
$$+ \beta_1 lX_{t-1} + \beta_2 lREER_{t-1} + \beta_3 lMW_{t-1} + \beta_4 lP_{t-1} + \beta_5 lPCI_{t-1} + \varepsilon_t \text{ ------- (2)}$$

Where, Δ represents first difference and l is natural log of respective variables. Pesaran et al (2001) proposed that the bound test is based on Wald coefficient test or F–statistics for cointegration analysis. The test is conducted in following way. The null hypothesis considers the UECM in equation 2 by excluding the lagged

level variables lXt-1, lREERt-1, lMWt-1, lPt-1 and lPCIt-1. More formally, a joint significance test is performed. The null (H0) and alternative (HA) hypotheses are
H0:β1 = β2= β3= β4= β5=0; and
HA: β1 ≠ β2≠ β3≠ β4≠ β5≠0.

At conventional level of significance of 1 percent, 5 percent or 10 percent, if the calculated F-value falls outside the critical bound values tabulated at Pesaran et al (2001), a conclusive inference can be made about accepting or rejecting the null hypothesis of no cointegration among the variables. If the F-value is greater than the upper limit of the bound values, we reject the null hypothesis that there is no cointegration between the variables under study. If the F-value is less than the lower limit of the bound value, then we accept the null hypothesis of no cointegration among these variables. However, if the calculated F-value falls within the critical bound limits, then the order of integration of the explanatory variables needs to be known before drawing any conclusion. The appropriateness of the model and reliability of the parameters will be decided on the basis of various diagnostic tests to check the problem of normality, serial correlation, hetroscedasticity associated with the model. RESET test is done to test for specification of the model. Cumulative sum of recursive residual (CUSUM) test and Cumulative Sum of Square (CUSUMSQ) test will be used to check the stabilityof the parameter.

A causality test is done to find the causal relationship between export and other variables on the basis of following vector error correction model (VECM).

$$\Delta lX_t = \phi_0 + \sum_{i=1}^{n} \phi_{1i} \Delta lX_{t-i} + \sum_{i=0}^{n} \phi_{2i} \Delta lREER_{t-i} + \sum_{i=0}^{n} \phi_{3i} \Delta lMW_{t-i} + \sum_{i=0}^{n} \phi_{4i} \Delta lP_{t-i} + \sum_{i=0}^{n} \phi_{5i} PCI_{t-i}$$

$$+ \lambda_1 ect_{t-1} + \vartheta_t \quad \text{-------} (3)$$

Where Δ represents first difference operator, ECTt-1 is the one period lagged error correction term derived from the long term cointegration equation and κt is residual term which is assumed to be normally distributed and white noise. The significant negative error correction term shows that all these variables cause change in agricultural exports in the long run. Further, F-value of all first differenced explanatory variables are also significant showing that all the explanatory variables also Granger cause agricultural export growth in the short run as well.

5. Empirical Results and Analysis

Following Enders (1995) suggestion both ADF and PP test have been used to test the order of integration of the variables. The result is shown in table 2. The ADF result shows that all variables are non stationary at level but are stationary at first difference. The Philips-Perron unit root test also confirms the ADF test result. Thus we may conclude that all the variables included in the model are integrated of order one i.e. I(1).

In order to examine the relationship between the India's agricultural exports and its determinants, the UECM version of ARDL model (Pesaran et al, 2001) with lag three (selected on the basis of AIC and other criterion given in table 3) is estimated. The result of the equation is presented in table 4.The diagnostic tests like Breusch-Godfrey serial correlation LM test, the ARCH test for hetroscedasticity, Jarque-Bera test for normality of the residual term, and Ramsey RESET test for model specification confirm the validity of the estimated equation. The diagnostic tests suggest that the equation have desired properties. The Breusch-Godfrey serial correlation LM test statistics rejected the first and second order serial correlation for the equation. Breusch-Pagan-Godfrey, White and ARCH test for hetroscedasticity confirm that there is no problem of hetrocedasticity. The Jarque-Bera statistic verifies that the estimated residual term has normal behaviour. RESET test confirms the correct functional form of the equation.Cumulative sum of recursive residual (CUSUM) test and Cumulative Sum of Square (CUSUMSQ) tests (given in figure 1 and figure 2) also verify that the parameters are stable over time.

The result of the bound test to examine the presence oflong run relationship between India's agricultural exports; world demand for agricultural goods; REER; production of agricultural goods; and per capita income of Indiaisgiven in Table 5. The result shows that the computed F-statistics (28.23) is greater than the critical upper bound value at1% level. Thus, we may conclude that there exists a longrun stable relationship between these variables.The result of UECM shows that agricultural exports are significantlyrelated to all these variables as is revealed from the t-values of the coefficients. The signs of all the coefficients are also consistent with theoretical expectation. Agricultural exports arenegatively related to India's Per capita incomeand REER and arepositively related to other variables. Thus depreciation of Indian rupees since reforms has led to rapid growth of agricultural exports by increasing the demand from rest of the world as well as by making exports more profitable for exporters. Similarly, increase in production of agricultural goods by increasing the capacity to export helps in growth of agricultural exports.

The error correction is negative and significant given in table 6 showing that in the long the long run,

REER, world demand, agricultural production and per capita income cause change in agricultural exports.

6. Conclusion and Policy Implications

Realising the importance of agriculture export in Indian economy, the paper has attemted to analyse the growth of agricultural exports and investigate the factors affecting the growth of India's agricultural exports. On the basis of bound test approach to cointegration, the study found long run cointegration relationship between agricultural exports of India and REER, demand for agricultural products, agricultural production and India's per capita income. All these variables Granger cause agricultural exports of India in the short run as well as in the long run.

On the basis of above findings, following policy recommendations can be made.

- The study found positive relationship between index of agricultural production and export supply. This implies that government should encourage farmers to increase agricultural production and productivity by providing support in the form of ensuring timely supply of adequate amount of fertilizers, cheap power to agriculture sector etc.
- Import of some of the agricultural goods should be liberalized to augment the supply of necessary items in order to ensure their adequate supply to prevent rise in their prices.
- Further, the government should also organize the developing agricultural economy to put pressure on developed nations to liberalize their economy for agricultural goods and reduce support to this sector. This will increase world demand for agricultural import from developing countries including India and hence will benefit India.
- Since appreciation of rupee exchange rate negatively affects the export growth, the government should manage the exchange rate not to let it to appreciate.

Table 1. Composition of Exports (% Share)

Commodities	1980-81	1990-91	1992-93	1996-97	2000-01	2005-06	2010-11	2013-14
I. Agriculture. & Allied Products, Of which,	100	100	100	100	100	100	100	100
1 Coffee	10.4	10.4	4.1	5.9	4.3	2.9	2.7	1.8
2 Tea & Mate	20.7	20.7	17.0	4.4	7.1	4.8	3.0	1.9
3 Oil cakes	6.1	6.1	9.8	14.2	7.1	8.6	10.0	6.5
4 Tobacco	6.8	6.8	4.1	2.9	2.9	2.9	3.6	2.4
5 Cashew Kernels	6.8	6.8	7.2	5.4	6.4	5.7	2.6	2.0
6 Spices	0.5	0.5	3.6	4.9	5.7	4.8	7.2	6.1
7 Sugar & Molasses	1.9	1.9	0.5	4.4	2.1	0.0	5.1	2.8
8 Raw Cotton	8.0	8.0	13.4	6.4	0.7	1.0	11.9	8.5
9 Rice	10.9	10.9	7.2	10.8	10.0	18.1	10.4	17.9
10 Fish & fish product	10.5	10.5	14.9	16.7	22.1	16.2	10.7	11.7
11 Meat & meat preparation	2.7	2.7	2.1	2.9	5.0	4.8	8.1	10.5
12Fruits, Vegetables. & Pulses	3.9	3.9	3.6	3.4	5.7	6.7	5.7	4.8
3.MiscellaneousProcessedfruits	1.7	1.7	3.6	3.9	3.6	2.9	3.3	3.6

Source: Government of India, Economic Survey, various issues.

Table 2a. Result of Unit Root Test
(Augmented Dicky-Fuller Test)

Variables	Level			First Difference			Order of Integration
	Constant	Constant and Trend	None	Constant	Constant and Trend	None	
lX	1.480221	-2.071301	0.990217	-4.506697*	-3.474014*	-3.078840*	I (1)
lREER	-1.637847	-0.079480	-0.476343	-3.709116*	-4.379329*	-1.985449**	
lMW	-0.087577	-2.009067	3.625491	-5.743428*	-5.652890*	-4.153146*	I (1)
lP	-0.315868	-1.867041	3.933934	-8.221853*	-8.078741*	-5.891672*	I (1)
lPCI	2.093741	-1.182261	11.17744	-4.171240*	-4.721682*	-1.693027***	I (1)
Critical Values							
1%	-3.724070	-4.374307	-2.660720				
5%	-2.986225	-3.603202	-1.955020				
10%	-2.632604	-3.238054	-1.609070				

The critical values are those of McKinnon (1991).
*, ** and *** represents significant at 1% , 5% and 10% level of significance.
i.Lag lengths for the ADF test is chosen on the basis of the Schwarz Criteria (SIC).

Table 2b. Result of Unit Root Test
(Philips-Perron Test)

Variables	Level			First Difference			Order of Integration
	Constant	Constant and Trend	None	Constant	Constant and Trend	None	
lX	1.733820	-2.445881	3.503468	-7.803990*	-19.53713*	-6.254811*	I (1)
lREER	-2.124166	-0.306701	-1.210097	-3.851355*	-4.444797*	-3.803000*	
lMW	-0.087577	-1.986917	3.625491	-5.743428*	-5.652890*	-4.325917*	I (1)
lP	-0.752504	-3.427205	8.885422	-9.818266*	-9.602691*	-5.888168*	I (1)
lPCI	2.652119	-1.152870	10.21157	-4.189432*	-4.973337*	-1.693027***	I (1)
Critical Values							
1%	-3.670170	-4.296729	-2.644302				
5%	-2.963972	-3.568379	-1.952473				
10%	-2.621007	-3.218382	-1.610211				

The critical values are those of McKinnon (1991).
*, ** and *** represents significant at 1% , 5%and 10% level of significance.
i. .Number of truncation lags in the PP Unit root test determined by the Newey –West criterion.

Table3. Lag Order Selection Criteria

Lag	AIC	SC	HQ
0	-1.215742	-0.753166	-1.064954
1	-1.080976	-0.380377	-0.856848
2	-1.099817	-0.156855	-0.804493
3	-2.860281*	-1.670812*	-2.496648*

* indicates lag order selected by the criterion
LR is sequential modified LR statistics
FPE denotes Final prediction error
AIC refers to Akaike Information criterion
SC is Schwarz information criterion
HQ denotes Hannan-Quinn information criterion

Table4. Estimated UECM of India's Agricultural Exports

Variables	Coefficients	t-values	Prob.
C	-106.6627	-7.873101	0.0000
lX(-1)	-1.040186	-7.137809	0.0001
lREER(-1)	-4.993408	-6.232164	0.0003
lMW(-1)	4.827986	8.341953	0.0000
lP(-1)	10.74185	5.533932	0.0006
lNPCI(-1)	-6.797665	-7.025589	0.0001
D(lX(-2))	-0.528077	-4.331861	0.0025
D(lX(-3))	-0.402035	-3.712478	0.0059
D(lNREER(-1))	-4.084100	-5.375327	0.0007
D(lNREER(-2))	-2.146200	-3.461483	0.0085
D(lNREER(-3))	-2.898394	-5.301862	0.0007
D(lP)	2.227470	3.136036	0.0139
D(lP(-1))	-6.790060	-6.432624	0.0002
D(lP(-2))	-1.649612	-3.024308	0.0165
D(lMW)	2.136711	7.600693	0.0001
D(lMW(-1))	-1.309859	-3.688728	0.0061
D(lMW(-2))	-1.256726	-4.127823	0.0033
D(lPCI(-1))	4.408658	5.727954	0.0004
D(lPCI(-2))	3.735540	5.767615	0.0004
D(lPCI(-3))	3.906667	7.541054	0.0001
Diagonistic Test			
Adjusted R square	0.888721		
Jarque-Bera normality test	0.8760 [0.645]		
Breusch-Godfrey serial correlation LM test	F = 0.640940; P.F.(1,7): [0.4497], F=1.86527, P.F. (2,6): [0.2344]; F=1.056826, P.F. (3,5): [0.4449]		
Breusch-Pagan-Godfrey	0.211877 [0.9900]		
Heteroskedasticity Test: White	F =1.813843, P.F.(19,8): [0.1964],		
ARCH test	F = 0.317778, P.F.(1,25): [0.5780], F =1.012003, P.F.(2,23): [0.3791], F = 1.003903, P.F.(3,21): [0.4106]		
Ramsey RESET	F = 0.099772, P.F.(1,7): [0.7057], F = 0.070246, P.F.(2,6): [0.9329], F = 0.697213, P.F.(3,5): [0.5926]		

Note: Values in square bracket is probability value

Table 5. Bound Test for Cointegration Analysis

Calculated F-value: 28.23*		
Significance Level	Critical Bound	
	Lower Bounds	Upper Bounds
1 Percent	3.74	5.06
5 Percent	2.86	4.01
10 Percent	2.45	3.52

Notes: The F-statistic(Wald test) is a joint test for the coefficients of lX(-1), lMW(-1), lREER(-1), lP(-1), and lPCI(-1) all are set equal to zero. The reported bounds critical values are taken from Pesaran et al (2001), Table CI(iii) Case III: Intercept and no trend with four regressor case, p.300.
* significant at 1 percent.

Table 6. Ganger Causality Test

Dependent Variables	F-Statistics				ECT_{t-1} (t-statistics)
	lREER	*l*Mw	*l*P	*l*PCI	
F-Values	11.49* [2, 21]	5.47* [3, 22]	5.76* [1, 20]	3.68 [1, 20]	-0.027* (--2.87)

Note: *, ** show significant at 1 percent and 5 percent respectively. Values in square brackets are degrees of freedom.

Figure 1. Plot of CUSUM Test of Equation 2

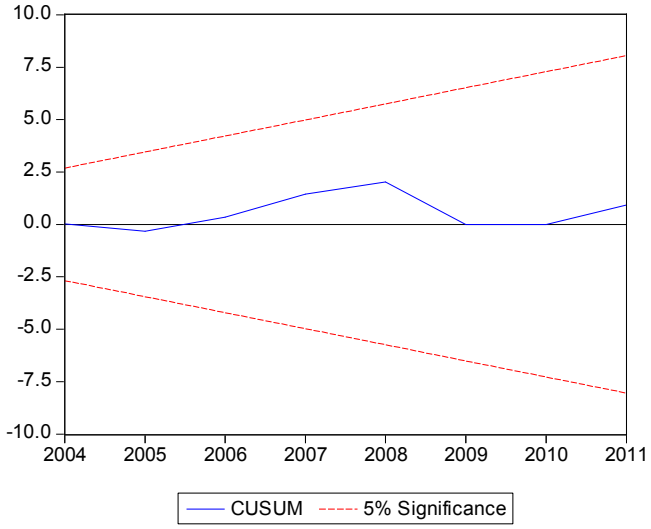
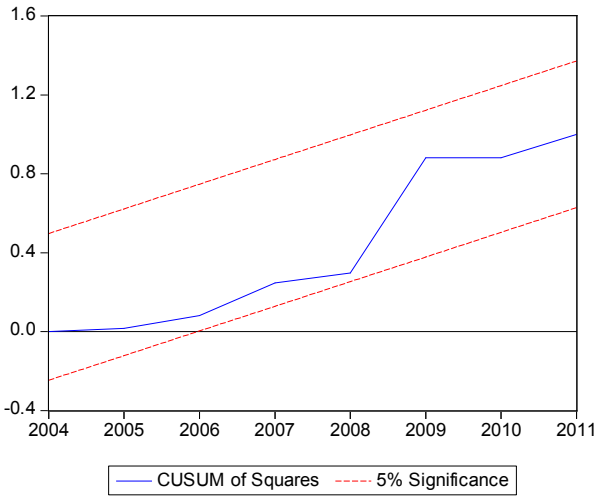


Figure 2. Plot of CUSUMSQ Test of Equation 2



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