Chapter Seven

Summary of Findings, Policy

Implications and Conclusions
CHAPTER SEVEN
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POLICY IMPLICATIONS AND CONCLUSIONS

7.1 Introduction

This chapter discusses the conclusions that were drawn from the present research and identifies the limitations of this study. The chapter also discusses the implications for future research. This work has employed various econometrics techniques to examine and explain the growth of agricultural export in India during pre and post WTO. Another purpose of this study was to examine the long run and short run relationship between export price index, quantity of domestic production of agricultural product, exchange rate, gross domestic product, WTO (as dummy variable) as independent variables and quantity of agricultural exports as dependant variable. The time series data for 31 years are applied for analyzing the growth of agricultural export and its determinant variables in India.

this thesis analyzes India’s case. An attempt has been made to trace the effect of WTO on growth of agricultural export.

### 7.2 Summary of findings

The main objective of this study was to examine the determinants of agricultural export in India since WTO using annual data for the period 1980-2010. Time series techniques were used to estimate the export supply function for agricultural export in India. Four time series techniques were used: unit root test, cointegration test, autoregressive distributed lag model and error correction model. The result of unit root test indicated that all variables except GDP and export price index were stationary at first difference. Export price index was stationary at level and GDP became stationary when second difference was used.

The results of cointegration test showed that the F statistic was 5.1071 and was higher than the upper bound at 1% and 5% level of significance, thus the variables were cointegrated. So there was a long run relationship among the variables, namely export price index, gross domestic product, exchange rate and domestic production which determined agricultural exports.

The value of determination coefficient was 0.99 which indicated that the 99 percent of agricultural exports explained changes of dependent variables such as export price index, gross domestic product, exchange rate and domestic production. F statistic was also significant at 1% which indicated overall goodness of fit.
The results of long-run estimated coefficients of export supply function showed that exchange rate (ER) had a statistically significant and negative impact on agricultural export i.e., one percent increase in exchange rate can lead to 0.79 percent decrease in agricultural export. The long-run coefficient of domestic production of agricultural product (QP) and export price index (PI) have positive sign and are significant at 5% level i.e., one percent increase (decrease) in domestic production of agricultural product and export price index can lead to 0.71 and 1.84 percent increase (decrease) in agricultural export respectively. The long-run coefficients of Gross Domestic Product (GDP) and WTO as dummy variable (D1) have positive and negative sign respectively but are insignificant. On the other hand, for the export supply of agricultural product, with the exception of Gross Domestic Product (GDP) and dummy variables, all other variables are significant and the coefficients are consistent with a priori expectations too.

The results of Granger causality test showed that there is no significant relationship between growth of agricultural exports and GDP growth rate in the pre WTO period. In Other words, both the variables do not cause each other in either direction. While there is significant relationship between growth of agricultural exports and GDP growth rate in the post WTO period. In the post period, Export growth does Granger cause GDP growth but GDP growth does not Granger cause growth of agricultural exports.

The results of long-run estimated coefficients of export supply function showed that the coefficient of the ECM is very high at (-) 0.54 implying a fairly
high speed of adjustment to the long-run disequilibrium after a shock. The Coefficient of the ECM term suggests that adjustment process was fast and 54% of the previous year’s disequilibrium in equity prices from its equilibrium path will be corrected in the current year. It is also observed that dummy variable is not significant in long term but it is statistically significant in short run.

The results of deceptive statistic of India’s direction of trade showed that India’s agricultural exports are broadly divided into following four groups.

The group of countries to which India agricultural exports are:-

1. Organisation for Economic Co-operation & Development (OECD) comprising of USA, Canada, European Union (EU).
2. Organisation of Petroleum Exporting Countries (OPEC) which includes Iran, Iraq, Saudi Arabia and others.
3. Eastern Europe which includes Russia and others.
4. Developing Nations which includes Singapore and others.

Table 7.1: Direction of India’s agricultural Exports:

<table>
<thead>
<tr>
<th>Countries</th>
<th>(1990-1991) % of total</th>
<th>(2000-01) % of total</th>
<th>(2009-2010) % of total</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD</td>
<td>17.24</td>
<td>42.71</td>
<td>34.47</td>
</tr>
<tr>
<td>OPEC</td>
<td>20.80</td>
<td>34.72</td>
<td>54.82</td>
</tr>
<tr>
<td>EASTERN EUROPE</td>
<td>60.44</td>
<td>15.37</td>
<td>7.24</td>
</tr>
<tr>
<td>Developing countries</td>
<td>1.52</td>
<td>7</td>
<td>3.47</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Sources: Directorate General of Commercial Intelligence & Statistics

Table (7.1) reveals following changes in India’s agricultural exports:-
1. The share of OECD was 17.24% in 1990-91 and 34.47% in 2009-10. About 46.53% of these exports have been to European Union (EU) countries.

2. The share of OPEC which was 20.80% in 1990-91. In 2009-10 it has increased to 54.82%

3. There was a rapid decrease in the share of Eastern Europe particularly U.S.S.R. Due to political problems and disintegration of the U.S.S.R, the share of Eastern Europe decreased from 60.44% in 1990-91 to 7.24% in 2009-10.

4. The share of developing nations increased from 1.52% in 1990-91 to 3.47% in 2009-10. Among the Asian countries the major export destinations have been Hong Kong, Singapore and Thailand.

The results of deceptive statistic also revealed that the average of Agricultural exports growth was 2.41 percent in pre WTO which increased to 13.78 percent in the post WTO regime. The global agriculture trade regime under the World Trade Organisation (WTO) has led to an increase in the import of farm products into India rather than boosting exports. This favourable trend in the initial years of the WTO did not last long and the next three years witnessed a whopping rise in imports and a slight decline in exports. The study attributes the slow-down on agro-exports and sharp rise in imports to the decline in global prices of almost all major agriculture commodities after 1997. This crash was due partly to the cyclical nature of international prices and partly due to increased global competition in agro-export because of liberalising trade. The situation was aggravated by an increase in the already high farm subsidies in the developed countries.

7.3 Result of hypotheses testing

The Autoregressive Distributed Lag Model (ARDL) developed by Pesaran (1996, 2001) was taken as the theoretical framework for undertaking
empirical work on the estimation of export supply function in India. In the empirical investigation of the supply function of agricultural export in India, cointegration, error correction approaches have been applied. The results of regression model are summarized in table (7.2).

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Hypotheses</th>
<th>Methodology</th>
<th>Statistical model</th>
<th>Coefficient</th>
<th>t-ratio</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Export price index and export supply of agricultural products are positively related.</td>
<td>Autoregressive distributed lag model</td>
<td>0.71009</td>
<td>2.8110</td>
<td></td>
<td>Accepted</td>
</tr>
<tr>
<td>II</td>
<td>Positive correlation exists between domestic production and export supply of agricultural products.</td>
<td>Autoregressive distributed lag model</td>
<td>1.8427</td>
<td>2.5769</td>
<td></td>
<td>Accepted</td>
</tr>
<tr>
<td>III</td>
<td>Exchange rate has no impact on export supply of agricultural products.</td>
<td>Autoregressive distributed lag model</td>
<td>-0.78922</td>
<td>-5.2471</td>
<td></td>
<td>Rejected</td>
</tr>
<tr>
<td>IV</td>
<td>There is positive relationship between GDP of India and export supply of agricultural products.</td>
<td>Autoregressive distributed lag model</td>
<td>0.37233</td>
<td>0.75505</td>
<td></td>
<td>Accepted</td>
</tr>
<tr>
<td>V</td>
<td>There is short-run relationship between exchange rate, quantity of domestic production, export price index, GDP, dummy variable and agricultural export.</td>
<td>Error correction model</td>
<td>-0.53554</td>
<td>-5.6031</td>
<td></td>
<td>Accepted</td>
</tr>
<tr>
<td>VI</td>
<td>WTO has positive impact on export supply of agricultural products.</td>
<td>Autoregressive distributed lag model</td>
<td>Long run</td>
<td>-0.15053</td>
<td>-1.0639</td>
<td>Rejected</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Short run</td>
<td>0.342</td>
<td>3.68</td>
<td>Accepted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Paired t-test</td>
<td>-5.294</td>
<td></td>
<td>Accepted</td>
</tr>
</tbody>
</table>

Source: Research findings

The six hypotheses have been examined to present the relationship between India’s agricultural export and macroeconomic variables. According to table (7.2), the result of ARDL model shows that the first hypothesis has accepted so the export price index and export supply of agricultural products
are positively related. Also based on this model, the second hypothesis proves that Positive correlation exists between domestic production and export supply of agricultural products. The third hypothesis shows that there is negative relationship between exchange rate and quantity of agricultural export in India. The fourth hypothesis shows that there is positive relationship between GDP of India and export supply of agricultural products. Based on error correction model, the fifth hypothesis has accepted, therefore there is short-time relationship between exchange rate, quantity of domestic production, export price index, GDP, dummy variable and agricultural export. Finally, the six hypothesis shows that WTO has positive impact on export supply of agricultural products in India.

7.4 Policy Suggestions

Developing countries have no alternative but to agree with this new arrangement of trade. Though WTO has given special status to the developing countries by giving concessions and extra time to full fills their commitments, yet the global economic scenario is not in favour of them. Most of the developing countries are not keen on fresh negotiations as they feel that the WTO agreement has not given them the benefits that were promised to them. The use of collective bargaining power by the developing countries is the only way out to protect their interest at WTO. The exports of India can benefit only in this way.
The growth of agricultural exports has shown that it has long run and short run relationship with its major determinants of the export price index, gross domestic product, exchange rate and domestic production of agricultural products in India. Therefore, the process of agricultural exports development in the country will be based on the nature and stability of all macroeconomic variables that are considered in this research and the policy suggestions for them are as follows:

I) Regression analysis shows that there is positive relationship between GDP and export supply of agricultural products in India. So, any increase in real GDP would have a positive impact on the growth of agricultural exports in the long run. Therefore, India provides the evidence of growth-driven exports over the sample period. The Government of India and other policy-planning bodies should devise prudential norms and policies to make the macroeconomic fundamentals of the country strong enough to absorb the external shocks thereby achieving a fast growth of real economic variables to ensure a noticeable surge in the country’s exports. In this direction, increasing domestic and foreign investments in key areas and ensuring price, interest rate and political stabilities would go a long way.

II) Positive correlation exists between domestic production and export supply of agricultural products. Thus there is need for the Government to continue promoting manufacturing. Furthermore India has large potential in improving its agriculture sector as well as export sector. As the country has considered agriculture as the back bone of its economy, major policies are required for the
agriculture sector to contribute more in the economic growth including agricultural experts. The government should support farmers through training agriculture. Extension services, hard and soft infrastructure, subsidies, agricultural inputs and etc. Proper execution and governance of agri-development policies and etc. go a long way in increasing of productivity as well as exports.

III) Regression analysis shows that the exchange rate has a negative impact on export supply of agricultural products. In fact, in the era of devaluation, the authority in India used to place export as one of the foremost reasons of devaluing local currency against US$. For India’s agricultural export to be price elastic, policies that help increase the share of domestic goods in exportable commodities by the expansion of production base and that help diversification of the pattern of the export items should be prioritized. For improving the export earnings, India should adopt policies with the aim to maintain a stable competitive real exchange rate. In this direction, need is to establish a transparent exchange rate system under which the stability of the real exchange rate is achieved and maintained, and ‘getting the exchange rate right’ should be the essential part of the overall trade and economic growth strategy.

IV) Regression analysis also shows that the Export price index and export supply of agricultural products are positively related. An examination of the coefficient of variation in the domestic and world prices shows that the domestic prices are more fluctuating than world prices. Hence there is no fear
of volatility being transmitted to the domestic prices in opening up of trade. As it is seen that price policy has not been effectively implemented and that there has been an increase in trade volume of those commodities which showed a decline in the coefficient of variation in domestic prices. The external trade is more useful in reducing price instability in the domestic agricultural markets in India. Therefore a comprehensive domestic agricultural price policy and proper implementation can reinforce the positive externalities of agricultural exports in the post liberalisation era.

V) Regression analysis shows that WTO has no significant effect on export supply of agricultural products in the long run in India. But t-test proves there is significant difference with regard to effect of WTO on growth of agricultural export during pre and post WTO regime. Its reason being, the big standard deviation of agricultural exports growth before WTO than after WTO. So, the policy maker should find out the linkage of the export of different commodities in the domestic economy for stability situation on export strategy till it has positive effect on agricultural export and trade in the Indian economy.

VI) The result of error correction model shows that WTO has positive impact on export supply of agricultural products in short run. So, this research has revealed that the government should continue the World Trade Organization policy focusing on trade, market access, export subsidies and domestic support to earn more benefits of trade with other countries.
The changing scenario of Global agriculture, especially agricultural trade in the post-WTO regime is much challenging for developing countries like India. The Indian agriculture sector as well as world agriculture are in the midst of tumultuous changes brought about by a number of internal and external factors.

7.5 Limitations

The first limitation of the study is when the unit root tests were conducted, some variables were tested as being non-stationary in levels, but they became stationary after they were transformed into First and second-differenced data. Moreover, because there was a mixture of I(1), I(0) and I(2) variables, using panel cointegration analysis may not be possible because it is required that all variables have the same level of integration. Data limitations do exist on agricultural exports in FAO website especially before 1994.

7.7 Conclusions

This research work has analyzed the growth of agricultural exports in India during pre and post-world trade organization. The review of literature has provided an overview of growth of agricultural exports across the countries and different methods used to calculate the export supply function of agricultural products. The regression model of this work has been estimated based on neo-classical trade theory. The econometrics techniques such as autoregressive distributed lag model and error correction model has been used to determine the relationship between India’s agricultural exports and macroeconomic variables.
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Considering quantity of agricultural export as dependent variable and macroeconomic variables such as exchange rate, gross domestic product, export price index, quantity of domestic production of agricultural products and world trade organization (dummy variable) as independent variables, an attempt has been made to analyze the growth of agricultural export in India. The results show that there exists a long-run and short-run relation between agricultural exports and its determinants and also WTO does not have a positive effect on agricultural exports in the long run but it has positive effect on it in the short run, also paired t-test has confirmed that WTO has positive effect on growth of agricultural exports in India.

Agricultural exports policy of the government should be accompanied by such policies by which it would reinforce the spread effects and neutralize the backwash effects. This calls for a synergetic approach, integrating and coordinating the policies pertaining to macroeconomic variables towards
maximizing the benefit of world trade organization. Such empirical studies would provide the most needed base for policy direction.