

The Impact of Agricultural Imports and Exports on Agricultural Productivity

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Abstract

This paper analyze the impact of agricultural exports and imports on agricultural productivity secondly to it also analyzes the effect of exports on imports or moreover it analyzes the causal relationship agriculture exports, agricultural imports and agricultural productivity. Variable which we had taken to fulfill our objective are AY (Agricultural productivity), AMP (Agricultural imports), AXP (Agricultural exports) whereas AY is dependent variable and AMP, AXP are independent variable data which we had taken is from 1980 to 2010. So for this we have done certain methodology in which we had done pair wise granger causality and so by analyzing results we have seen the causality between these variable. By the results we had concluded that agricultural exports and agricultural productivity has a bi-directional causality and imports and exports have unidirectional causality whereas agricultural imports in terms of finished products and agricultural productivity have no causality because when the income of the peoples increases so this leads to increase in the imports this do not affect the agricultural productivity

Chapter 1. Introduction

1.1 Background to the Study

Agriculture exports and imports plays a vital role in increase in agriculture productivity if country exports are greater means that greater the demand for the products of that country which may ultimately increase the productivity in terms of agricultural products. The import of the agricultural product depend on the inflation rate so if the inflation rate may differ between two countries so the country having low inflation rate so the demand for the products will be increase with in the country and imports of product may leads to increase in the agriculture productivity. If the cheaper inputs for agriculture is imported because the demand for domestic product will be decrease due inflation rate difference and as a net effect imports of agriculture products can be positive effect on agriculture productivity(Kohsal2010) whereas the exports may also leads to increase agriculture productivity because exports of the products means that there is some demand for that products which we are exporting to other countries and it also indicates farmer to produce the product efficiently and more. Exports of the agriculture products also depend on the inputs supply because when there are greater inputs with cheaper price and efficient technology to utilize the these inputs to produce that much commodity or good that we can export them so this may also increase the agriculture productivity when there inputs available and besides this there are also some other factors which may effects the agriculture exports. (Krueger, 1997; Bleaney, 1999; and Ahmed, 2002), has mention in there paper that economic reforms policies on agricultural exports they investigate the results which was inconclusive while there are many studies done on this some suggest that there positive relationship among these. Another study was done which investigates the relationship among the agriculture trade policy and how it influence the trade liberalization on agriculture exports performance specifically openness, competitiveness and diversification in there study they analyzed that competitiveness and diversification has a positive relationship with exports policy and openness has negative relationship with exports policy and suggests that supply-side factors influence the exports policy now imports has a negative impact on agriculture productivity as mention above the impact is negative because imports of agriculture products means that either it has shortage in the country or the prices of that commodity or good is higher than of international product so this may ultimately effect the agriculture productivity besides this there are also some other factor which may lead to increase in imports of the agricultural products which are quality, per capita income. Per capita income increase means that when the average person income increases so this may ultimately increase the demand for import product and then as an effect the agriculture productivity decrease because then it will be less incentive or profit for making that product. Generally if the agriculture sector of any economy is developed it will result in overall economic development because agriculture is providing basic necessities in the form of food and raw material to agriculture sector especially in country like Pakistan where mostly people are dependent on agriculture so if the agriculture sector of Pakistan improve so this also increases the living standard of the people. All these improvements are possible if the trade policy related to agriculture is feasible for government and also for the people of the country now the main focus of the study is to know the impact of exports and imports of agriculture goods on agriculture production of Pakistan. Moreover the agriculture imports in terms of technology related to the agriculture like fertilizers, highbred seed, machinery which leads to increase the agricultural productivity to that level in which the cost of the technologies does not exceed the profit so the importation of this technologies is good but when we imports or prefer the imported agriculture product so the

ultimately has a direct effect on our agriculture productivity because when people prefer imported agriculture products over domestic product so it leads to decrease in demand of the domestic products so then it will also affect the prices of domestic product then as an effect the profit of the agriculture products producer will decline and then they will be unable to continue their production. Exports has two effects on the agriculture productivity first effect is positive. Positive effect in this sense that when exports of the agriculture products increases so this means that demand for the products of that country are increasing globally or internationally which intern to increase the profit of the producer of agriculture product and GDP of that country also increases now exports have negative effects when the exports of the agricultural products increases to that level that the domestic shortage occurs or more specifically that producer of agriculture products unable to fulfill the demand of the agriculture goods domestically so the exports should be carried to that level that in which the domestic demand and international or global demand both should be fulfilled equally.

1.2 Objective of the Study

The objective of this study is to see the causal relationship between the impact of exports and imports of agriculture products on the agriculture production of Pakistan.

1.3 Importance of the Study

The study shows the importance of agriculture exports and imports and how it influences the agriculture productivity or moreover we can say that this study will enable us to know that how imports of agriculture goods affect domestic demand for agriculture goods and how it may lead to decrease in agriculture productivity and it also enables us that how increase in export may affect or may increase the agriculture productivity within a country and how the living standards of the people increase when exports are greater than imports.

1.4 Hypotheses

- H0 There is no impact of agriculture export on agriculture productivity
- H1 There is impact of agriculture export on agriculture productivity
- H0 There is no impact of agriculture imports on agriculture productivity
- H1 There is impact of agriculture imports on agriculture productivity

1.5 Organization of the Study

The research is organized in chapters. Chapter 1 includes introduction, objectives, and the importance of the study, research questions, hypothesis Chapter 2 is literature review according to the research objectives and questions. Chapter 3 consists of Data, variable Methodology of the study and Chapter 4 consists of Empirical Results and chapter 5 consists of conclusion and policy implication

Chapter 2. Literature Review

In literature review we will discuss that how other researchers have shown the impact on agricultural productivity. Kohsal (2010), conducted a research in which he shows the impact of liberalization on agriculture imports variable which he had taken are agricultural exports, growth rate of GDP, the growth rate of net factor income remittances from abroad (NFI), growth rate of real investment, the growth rate of agricultural imports (M) and the nominal exchange rate. The aim of the study is to determine the relationship among agricultural imports and liberalization to achieve the objective of the research they had used 2SLS model and the finding of this research was that agriculture imports increase the productivity like when cheaper inputs are imported and then further used it in agricultural process so this may lead to increase in agricultural productivity. The result shows that Agricultural exports rate and all other variables shows the positive relationship with agriculture imports

Chaudhry (2001), conducted a research in which he states that the reform program under WTO can propose that policies that Pakistan agricultural production can be improved by reducing government intervention in the commodity prices and improve efficiency of inputs and investing in market infrastructure for exports and take impact to ensure quality exports. The method which they had adopted is graphical analysis in which they had taken price of commodity internationally and then noted that what's the impact of on domestic prices and how it changes the exports and imports so they concluded that if the prices of international products increase so then ultimately the imports of that commodity will decrease and demand for domestic product will increase

Chaudhry and Kayani (2009), conducted a research and said that there are annual losses occurring in the agriculture sector due to the low prices of agricultural products so as a result these losses are then faced in terms of reduction in agriculture output and ultimately as a direct effect on exports this may lead Pakistan to depend on foreign aid and imports of goods also increase and when the imports increase so the demand for domestic agriculture product decreases and then the domestic production of agriculture goods decreases so as by all the problems the exports of agriculture products or more demand for Pakistani products internationally may lead to decrease so at then the conclusion of this paper was to increase the prices of agricultural product to that level that

it gives profit to the producer so then they have the ability to increase the productivity by using good quality of inputs and efficient utilization of the resources.

Diao and all (2003), conducted a research there to investigate the impact of the agricultural trade policies on the developing country so in there research they analyzed that industrialized countries or the developed adopt certain polices which they used to protect their domestic production like they increase tariff on import and give subsidies to the exports which may leads to decline in the world prices because as they are developed countries so they produce goods or commodities cheaply so this may leads to decline in the world prices for this the model which is carried out is the economic model of world economies further the model use the data of 40 developing countries and 5 developed countries the variable which are used in this model was domestic production ,imports and exports of agriculture commodities and the data was derive from GTAP(global trade analysis project). The conclusion of their research was that if GAT should make certain polies to control the subsidies of developed countries and should make certain rules and regulation that both the countries should gain equal benefit.

Ahulia(1996), conducted the research in which he investigate the relationship exchange with the agriculture exports of India so in the research they had observe that when the currency of Indian was devalued so this may leads to decrease in the exports of the India and imports was increased so they started a strategy they imports input to agriculture sector like fertilizer and technology related to agriculture sector so as an effect the agriculture productivity may leads to increase which help them to exports some of the agriculture product so by this there currency rate also start increase and became stable.

Iqbal, Munir and all (2003), conducted a research in which they investigate the impact of credit on agricultural productivity for this the variables which are taken by them are production function related to agricultural output with institutional credit and other independent variable which they had taken are land and water they have included land and water because in the past researches which are done and have a problem of multicollinearity because they had neglected these variables so to remove this problem these researcher had included these two variables in their research. The data they had taken from ZTBL(zari-tarkiyati bank limited) and ADBP(Asian developmental bank Pakistan)so at the end they conclude that commercial bank should also play there role there in giving loans to farmer specifically to the small farmer as the had observed that credit plays and important role in agriculture productivity and it may also help farmer to increase the productivity by using modern technologies and high quality seed by importing and our exports will also increase as when we are producing high quality of with efficient use of technology and bank should also give insurance to the farmer for their agriculture output.

Hassine, Robichaud and Decaluwe (2010), explored the agricultural trade liberalization, productivity gain, and poverty mitigation in Tunisia. The model which were used in this research is Assessable General Equilibrium models to investigate the impact of trade liberalization situations on poverty and equity in Tunisia. Findings of this study showed that initial up of foreign trade increases productivity growth and poverty also drop by 11 percent under the agricultural trade liberalization policy.

Mustafa et al(2001), carried out a research in which they are had discuss that WTO role in policy making related to agriculture trade in this research they had examine that WTO have make certain rules in which they had put tariffs on the export of developed countries which had help developing countries like Pakistan. This tariff which is imposed on developed countries helped in this sense that when there was less tariff on exporting agriculture commodities so this may ultimately effect the prices of good or commodities of the developing countries because due to the technological advancement developed countries can produce that same commodities cheaply or sometime the these countries do dumping to attain the market in developing countries which had an direct effect on the domestic demand of that countries and then there imports start increases and exports may leads to decline so then this may lead to declines in agricultural commodities.

Pratt et al (2011), conducted a research for sub Saharan country in their study they analyzed the policy related to the agriculture productivity they had observed that agricultural productivity is very much low as compare to rest of developing countries so he find that what are the reason that agriculture productivity is very much less as compare to the rest of the developing so his finding were that there is a lack of technology secondly the imports of seeds was high third point is that as the agriculture productivity of land was very much low so for this at last he concluded that there is lack of technology in sub Saharan countries so if they improve these technologies like use of fertilizer, high breed seed so they will be able to improve their agriculture productivity because evidences from the past in mid-1980,s and early 1990,s they have increase the technology a bit which increased the agriculture productivity hence by this his conclusion was that if they do technological advancement so then as an effect the agriculture productivity will be increased.

Chadha (1999), tells us in his research that Trade and Balance of Payments, International prices have been unstable. Besides increasing the type of exports to obtain more export revenue, India should also seriously consider exporting more value (Asia-Pacific Development Journal Vol. 10, No. 2, December 2003 70). “Accelerating Growth through Globalization of Indian Agriculture, Macmillan”, India Agricultural products

through agro-processing such as processed vegetables, fruits, and fish and meat products given that export or even local demand for basic agricultural products would decline as incomes rise. The move to higher value added activities within the agricultural sector also spells greater opportunities for industrialization and vice versa. Chaudhry and Kayani (1991); Dorosh and Valdes (1990); Mellor (1975) In their study explains that in general terms, low agricultural commodity prices and its impact on productivity or moreover they explain that low prices of the agricultural output leads to reduce the growth of agricultural production because when there is low prices of agricultural products and prices are that much low that it cannot cover the cost which farmer had incurred in the agriculture process or doesn't make farmer to save for them so as an effect the productivity may lead to decline and they also emphasize that urban-rural income inequalities also leads to decline the productivity so they conclude that by relocating of income between people the productivity will flourish moreover by income they mean that prices should be set in this way that it would benefit the farmer so then productivity leads to increase. The focus of this research is on low agriculture commodity prices how it leads to decline in the productivity of the agriculture output.

Chapter 3. Data Model and Methodology

3.1 Variable

For conducting the study the variables which are included are AY (agricultural Productivity), AMP (Agricultural imports), AXP (Agricultural Exports) whereas AY is dependent variable, AMP and AXP are independent variables. In the above variables we will examine the impact of agriculture imports, exports of explanatory variables on agriculture productivity as dependent variable further we will see that effect of agriculture imports on Agricultural exports.

3.2 Data

Data taken for the study would be secondary for 30 years from fiscal year 1980 to 2010 defining the exports and imports variable. According to the study the data would be time series.

3.3 Data Source

Data is taken from Pakistan economic survey which is time series from fiscal year 1980 to 2010.

3.4 Methodology

In methodology we will do pair wise granger causality test and by seeing the variables the model estimation would be done. By using e-views software the study will analyze the impact of agricultural Exports and imports on agriculture productivity so for this different tests would be run to obtain desired results for results.

3.5 Econometric Model

For the econometric model we will use pair wise granger causality to see the effect of the variable which is responsible for the agricultural productivity.

3.5.1 Granger Causality

Granger Causality has been used to see whether one time series such as variable X is useful to forecasting another variable Y. This research is going to see the causality relationship between Exports AXP with Agriculture productivity Ay. Secondly research will see the causality relationship between Imports AMP with Agriculture productivity AY and thirdly research wants to see the causality relationship between Imports AMP with Exports AXP.

Enders suggests granger causality and mentions that it is tested in order to understand that whether the lag value of one variable causes another variable or not. E.g. if there is two equation model X and Y having p lags, X is granger cause Y if the whole coefficients are not equal to zero. The F test may be suitable for granger causality if all the variables in VAR are stationary.

$$\Rightarrow x_t = \alpha_0 + \sum \alpha_i x_{t-i} + \sum \beta_j Y_{t-j} + e_t \quad \text{Ⓜ(i)}$$

$$\Rightarrow y_t = a_0 + \sum a_i x_{t-i} + \sum b_j y_{t-j} + u_t \quad \text{(ii)}$$

Here we suppose that the disturbance of u_{1t} and u_{2t} are uncorrelated. The null hypothesis of Granger causality can be expressed as:

H_0 : Y does not Granger cause X

As per the definition of Granger causality Y does not cause X if,

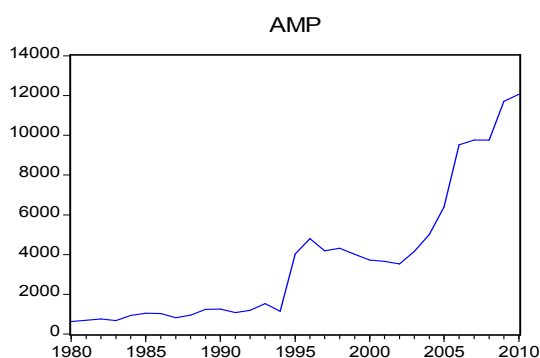
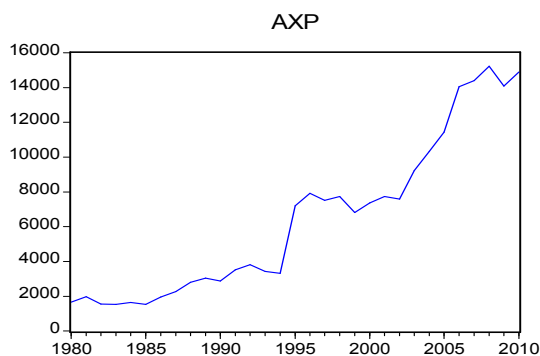
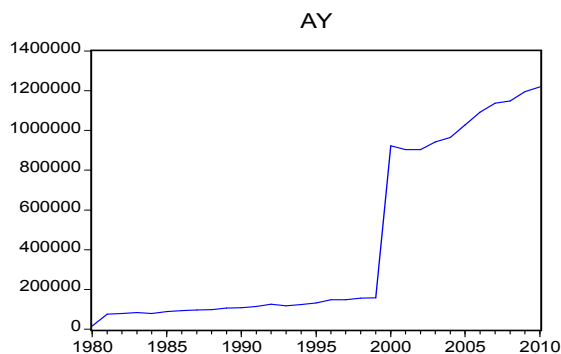
$$\alpha_1 = \alpha_2 + \alpha_{t-i} \dots \alpha_j = 0 \quad (\text{iii})$$

And

X does not cause Y if,

Chapter 4. Empirical Results and Analysis

4.1 Graphical Analysis



Interpretation of Graphs

This includes AY (agricultural productivity), AMP (agricultural imports), and AXP (agricultural exports). AY from 1980 to 2000 was not as much because of low productivity and lack of efficient use of resources or inputs. Secondly, agriculture productivity was less because there was a lack of technologies in terms of highbred seeds and use of fertilizer to get maximum of efficient productivity. Whereas from 2000 there was a spontaneous increase in productivity because of the efficient utilization of resources and the use of technologies in the agriculture sector, which leads to an increase or spontaneous increase in agricultural productivity. But this pattern further in later periods was increasing but there was a gradual increase in productivity because the technology became standard, that spontaneous increase was due to the introduction of new technology or in that time it was totally new but later on it became standard and then due to an increase in agriculture productivity further it also increases the exports which was greater than imports so as a result the agriculture productivity was flourished.

4.2 Descriptive Statistics

Date: 12/13/13 Time: 10:14			
Sample: 1980 2010			
	AY	AXP	AMP
Mean	439176.7	6467.694	3728.739
Median	133215.0	6808.000	3521.900
Maximum	1218873.	15236.20	12061.80
Minimum	15826.00	1540.100	622.1000
Std. Dev.	460281.2	4591.857	3478.325
Skewness	0.667817	0.624692	1.151104
Kurtosis	1.560324	2.109794	3.194628
Jarque-Bera Probability	4.981420 0.082851	3.039842 0.218729	6.894973 0.031826
Sum	13614479	200498.5	115590.9
Sum Sq. Dev.	6.36E+12	6.33E+08	3.63E+08
Observations	31	31	31

Interpretation of Descriptive Statistics

The table shows the data information's which are mean, median, maximum minimum, standard deviation skewness, and kurtosis. Mean is derived by summation of all values and then divided by the total number of observations whereas median is obtained by arranging the values in order and then the value which is in the middle after re-arrangement of the data that is median and maximum is the value which is highest than all the values so that is maximum and minimum is the smallest value in the data. Standard deviation show the deviation in the data from variance. Skewness shows that what the trend of the data is so according to the data two variables show the normally skewed whereas one variable is positively skewed. Kurtosis show that weather the data is leptokurtic or mesokurtic or heptokurtic whereas probabilities show the acceptance or rejection of the hypothesis

4.3 Pairwise Granger Causality Test

Pairwise Granger Causality Tests			
Date: 12/13/13 Time: 10:14			
Sample: 1980 2010			
Lags: 1			
Null Hypothesis:	Obs	F-Statistic	Probability
AXP does not Granger Cause AY	30	2.11188	0.03768
AY does not Granger Cause AXP		2.21908	0.02790
AMP does not Granger Cause AY	30	1.46179	0.23713
AY does not Granger Cause AMP		3.15694	0.08687
AMP does not Granger Cause AXP	30	0.89266	0.35314
AXP does not Granger Cause AMP		4.69582	0.03923

In the first step pair wise granger causality test has been done in this test the dependent variable is checked that it

effected by independent variable now the interpretation is as under by seeing the signification level which is 5%(0.05) if probability value is greater than significant value so it mean that accept null hypothesis and reject alternative hypothesis

- 1- AXP(Agriculture exports) Probability value is 0.03768 which is less than significant value so null hypothesis is rejected and may conclude that Agriculture exports cause effect on the Agricultural productivity or when exports increases so agriculture productivity also increases
- 2- AY(Agricultural productivity) P-value is 0.02790 which is less than significant value so null hypothesis is rejected and may conclude that agriculture productivity effect the agricultural exports
- 3- AMP (Agricultural imports) P-value is 0.23718 which is greater than significant value so null hypothesis is accepted and conclude that agriculture Imports doesn't granger cause agriculture productivity.
- 4- AY(Agricultural productivity)P-value is 0.08687 which is greater than significant value so null hypothesis is accepted and conclude that agriculture productivity doesn't affect the agriculture imports
- 5- AMP(Agricultural Imports)P-value is 0.35314 which is greater than significant value so null is accepted and conclude that agriculture exports does not affect the agricultural exports
- 6- AXP (Agricultural exports) P-value is 0.03923 which is less than significant value so null hypothesis is rejected and may conclude that agricultural exports affect agricultural imports. If domestic exports increase it will have an impact on domestic imports. Causing increase or decrease in the domestic imports.

4.4 Results and Discussions

The results which is derived from the empirical analysis shows that agricultural exports and agricultural productivity have causal relationship between these two variables or more specifically when agricultural productivity increase so this may leads to increase in the agricultural exports like (Chaudhry and Kayani, 2009) has done that when agricultural productivity increases so may leads to increase in agricultural exports and vice versa .When agricultural exports increases so this means that there is also increase in agricultural productivity because when exports increases so this leads to utilize the resources efficiently to produce maximum output to fulfill the demand which also done by Iqbal, Munir and all (2003). While another objective of the research is that to check the effect of agricultural exports on agricultural imports so by seeing the above results it is also concluded that when agricultural exports increases so this leads to decrease in the agricultural imports because we are exporting the agricultural good mean that the agricultural productivity is greater so that why we are exporting and then ultimately the imports of agricultural commodities is less while agricultural imports doesn't cause any effect on agricultural productivity like when agricultural imports in terms of finished products so it does not increase or decrease the agricultural productivity which is also done by (Mustafa And all 2001) in their study

Chapter 5. Conclusion and Policy Recommendations

5.1 Conclusion

By this study we analyze that there is impact of agricultural exports on agricultural productivity because a country do exports when there is greater agricultural productivity and further the exports have also an effect on agricultural productivity because when there is greater exports so this means that the international demand of the products of that country is high, further it also indicate the producer of the agriculture products is efficient in fulfilling the international demand and also domestic demand. Now the impact of imports of agriculture products doesn't have any effect on agricultural exports because Importing of agriculture products is done to fulfill the domestic demand for that agriculture products so that is why we are importing it and it does not affect the exports whereas exports of agricultural products has an effect on imports of agricultural products because when there is exports of good between two countries so the country from which the product is exported to other country so that other country can say or put an obligation on the country from which he is exporting that exporting countries should also imports some of the products from their country, thirdly the impact of agricultural imports doesn't have any effect on agricultural productivity because importing of agricultural products means that to fulfill the domestic demand we are importing the agriculture product while we are not investing it in our agriculture sector to increase the agricultural productivity so that why imports do not have any impact on agricultural productivity

5.2 Policy Recommendations

According to the study government should adopt certain policy that help in improving the agricultural productivity by advancing the agricultural technologies in terms of highbred seeds and fertilizer and giving certain incentives to the agricultural producer to produce quality output with efficient utilization of the resources so as a net effect the exports will also increase. Secondly rather than importing the agricultural products

government should invest in the agricultural sector to increase the productivity so that there is no need of importing the agricultural products and domestic demand is fulfilled by the domestic production

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