Pak. J. Commer. Soc. Sci.
2012 Vol. 6 (1), 133-146

Contribution of Agricultural Exports to Economic Growth in Pakistan

Muhammad Zahir Faridi
Assistant Professor of Economics, Bahauddin Zakariya University, Multan, Pakistan.
E-mail: zahirfaridi@bzu.edu.pk

Abstract

The main objective of the present analysis is to explore and quantify the contribution of agricultural exports to economic growth in Pakistan. We have estimated the relationship between Gross domestic product (GDP) and agricultural and non agricultural exports for Pakistan employing Johansen co-integration technique for the period 1972 – 2008. The findings of the study show that the agricultural exports have negative and significant effect on economic growth while agricultural exports elasticity is 0.58. Moreover there is bidirectional causality in agricultural exports and real GDP. It is suggested that non agricultural exports should be promoted.

Keywords: Pakistan, Agricultural exports, non agricultural exports, Johansen co-integration, labor force.

1. Introduction

The most important and crucial aim of the underdeveloped countries is rapid economic growth and development and exports are generally perceived as an engine for economic growth. The desire for rapid economic growth in underdeveloped countries is attained through more trade. There is no shortage of empirical and theoretical studies regarding the role of exports in raising the economic growth and development. The classical economists like Adam Smith and David Ricardo have argued that international trade is main source of economic growth and more economic gain is attained from specialization. According to the export led growth hypothesis, exports are the major source of economic growth, has many theoretical justifications. First, in Keynesian theory more exports generate more income growth through foreign exchange multiplier in the short run. Second, Export raises more foreign exchange which is used to purchase manufactured goods, capital goods and technology. These things contribute to economic growth. Third, exports indirectly promote growth via increased competition, economies of scale, technological development, and increased capacity utilization. Fourth, many positive externalities like more efficient management or reduction of organizational inefficiencies, better production techniques, positive learning from foreign rivals and technical expertise about product design are accrued due to more exports, lead to economic growth.

Pakistan is considered the 27^{th} largest economy of the world because of more purchasing power albeit an underdeveloped country. The mainstay of Pakistan's economy is agriculture sector. Pakistan's major exports comprises on agricultural produce like wheat, rice, cotton, and other main crops. According to economic survey of Pakistan (2009 – 10), there exhibits a mixed picture of a comparative analysis of product wise shares in

world exports and Pakistan's exports. Pakistan's major exports categories remained textile manufactures, other manufactures and food having shares of 51 percent, 24 percent and 15 percent respectively during the year 2009 whereas the world's exports during the year 2008 are concentrated in manufactures, machinery, transport equipment, fuels and mining products with the share of 67 percent, 34 percent, 23 percent and 18 percent respectively. There is sizeable difference between world's demand pattern and Pakistan's exporting items. This divergent trend indicates that structural rigidities are present in the export hage of the country. The overall trend in agricultural exports performance has remained positive during the year 2010 – 11. The textile sector and food group have contributed 61.8 percent and 18.1 percent respectively to overall exports growth during the year 2010 – 11.

The main objective of the present research is to examine the contribution of agricultural export to economic growth in Pakistan the rest of the paper is organized as follows. Section II reviews the relevant important studies. The section III discusses the theoretical framework, and methodological issues and data analysis; the sources of data and description of the variables are given in the section IV. Results and discussion are given in the section V. Lastly, concluding remarks are offered in section VI.

2. Review of the past studies

A huge body of literature is available on the role of exports in economic growth. During the last two decades, a bulk of empirical research has been conducted to explore the effects of exports on economic growth or the export led growth hypothesis. These studies have used either time series data or cross sectional data with divergent conclusions. The earlier studies e. g Chenery and Strout (1966); Michaely (1977); Balassa (1978); Heller and Porter; (1978); Tyler (1891); and Kormendi & Mequire (1985) analyzed the relationship between economic growth and exports by using simple correlation coefficient technique and concluded that growth of exports and economic growth were highly positive correlated. The second group of studies like Voivades (1973); Feder (1983); Balassa (1985); Ram (1987); Sprout and Weaver (1993); and Ukpolo (1994) used regression techniques to examine the relationship between export growth and economic growth, considering the neo – classical growth accounting equation. They found a positive and highly significant value of the coefficient of growth of export variable.

The third group of researchers like Jung and Marshall (1985); Darrat (1987); Chow (1987); Kunst and Marin (1989); Sung-Shen et al. (1990); Bahmani-Oskooee et al. (1991); Ahmad and Kwan (1991); Serletis (1992); Khan and Saqib (1993); Dodaro (1993); Jin and Yu (1995) and Holman & Graves (1995) examined the causality relationship between growth of export and economic growth using Granger causality test. The studies concluded that there existed some evidence of causality relationship between exports and growth. The main problem with causality test is that it is not useful when the original time series is not co integrated. Finally, the recent studies[1] conducted to investigate the impact of exports on growth applying the technique of co integration and error correction models.

[1] See Kugler (1991), Serletis (1992), Oxley (1993), Bahmani-Oskooee and Alse (1993), Dutt and Ghosh (1994, 1996), Ghatak et al. (1997), Rahman and Mustaga (1998) and Islam (1998).

We have observed that mostly literature focused on the total exports as the only source of growth, but agriculture's share to total exports is generally substantial in under developed economies. It is very astonishing that empirical research on the contribution of agricultural exports to economic growth has been to some extent ignored in the literature despite its role in the development process being long recognized. But it is argued by the various economists that rising agricultural exports play a crucial role in economic growth. Johnston and Mellor (1961) discussed the role of agriculture sector in the process of economic development in many ways. They emphasized that expanding agricultural exports were the main source of rising incomes and increasing foreign exchange earnings.

Levin and Raut (1997) explored the effect of primary commodity and manufactured exports on economic growth. The exports of primary commodity included both agricultural products and other i.e metals and oil products. The study concluded that manufacturing exports were the main source of economic growth and the exports of primary products had a negligible effect.

Ekanayake (1999) analyzed the causal relationship between economic growth and export growth by using error correction and co integration models. The author had used the time series data of eight Asian developing countries covering the period from 1960 to 1997. The results of the study concluded that there was a bi – directional causality between export growth and economic growth in all the developing countries included in the analysis except Malaysia. There existed strong evidence for long run Granger causality in all countries.

Dawson (2005) studied the contribution of agricultural exports to economic growth in least developed countries. The author used the two theoretical models in his analysis. The first model was based on agricultural production function, including both agricultural and non agricultural exports as inputs. The second model was dual economy model i.e. agricultural and non agricultural where each sector was sub divided into exports and non export sector. Fixed and Random effects were estimated in each model using a panel data of sixty two less developed countries for the period 1974 – 1995. The study provided evidence from less developed countries that supported theory of export led growth. The results of the study highlighted the role of agricultural exports in economic growth. The study suggested that the export promotion policies should be balanced.

Aurangzeb (2006) studied the relationship between economic growth and exports in Pakistan based on the analytical framework developed by (Feder, 1983). Auther tested the applicability of the hypothesis that the economic growth increased as exports expanded by using time series from 1973 to 2005.The findings of the study showed that export sector had significantly higher social marginal productivities. Hence the study concluded that an export oriented and outward looking approach was needed for high rates of economic growth in Pakistan.

Kwa and Bassoume (2007) examined the linkage between agricultural exports and sustainable development. The study provided the case studies of different countries that were involved in agricultural exports. Nadeem (2007) provided the empirical analysis of the dynamic influences of economic reforms and liberalization of trade policy on the performance of agricultural exports in Pakistan. The author examined the effect of both

domestic supply side factors and external demand on the performance of agricultural exports. The major finding of the study was that export diversification and trade openness contributed more in agriculture exports performance. The results of the study suggested that agricultural exports performance is more elastic to change in domestic factors.

Sanjuan-Lopez and Dawson (2010) estimated the contribution of agriculture exports to economic growth in under developed countries. They estimated the relationship between Gross Domestic Product and agrarian and non agrarian exports. Panel co integration technique was used in analyzing the data set of 42 underdeveloped countries. The results of the study indicated that there existed long run relationship and the agriculture export elasticity of GDP was 0.07. The non agriculture export elasticity of GDP was 0.13. Based on the empirical results, the study suggested that the poor countries should adopt balanced export promotion policies but the rich countries might attain high economic growth from non agricultural exports.

3. Theoretical Framework and Methodology

The supply side perspective is considered in the theoretical framework in order to examine the contribution of agricultural exports to economic growth. We start with the neo-classical growth model, originally developed by Solow in 1956. The neo-classical production function is specified in terms of traditional inputs like labor and capital.

$$Y_t = f(L_t, K_t) \quad (1)$$

The aim of the present study is to explore how agricultural exports affect economic growth. So, we extend Solow's aggregate production by incorporating both agricultural and non agricultural exports as additional inputs with inflation as control variable.

$$Y_t = f(L_t, K_t, X_t^A, X_t^N, \pi_t^\lambda) \quad (2)$$

We consider the Cobb – Douglas form of neo-classical production function.

$$Y_t = A_t L_t^\alpha K_t^\beta X_A^\gamma X_N^\delta \pi_t^\lambda e^{\mu t} \quad (3)$$

Where Y_t = aggregate production of the economy at time period t, L_t = labor force participation at time t, K_t = capital stock at time period t, X_A = agricultural exports, X_N = non agricultural exports and π_t = inflation. α, β, γ, δ and λ are elasticities of production with respect to labor, capital, agricultural exports, non agricultural exports and inflation respectively.

By taking the natural logs (ln) on both side of the equation (3);

$$\ln Y_t = \ln A_t + \alpha \ln L_t + \beta \ln K_t + \gamma \ln X_A + \delta \ln X_N + \lambda \ln \pi_t + \mu_t \quad (4)$$

Where all coefficients are constant elasticity, μ_t is an error term and is independent of all other explanatory variables which indicate the influence of all other factors.

The following econometric model based on the equation (4) for selected variables used in the study is presented as follows;

$$LGDP = \beta_0 + \beta_1 LLAB + \beta_2 LCAP + \beta_3 LCPI + \beta_3 LAGX + \beta_4 LNAX + \mu_t \quad (5)$$

In order to explore the short run and long run relationship between agricultural exports, non agricultural exports and economic growth, we need time series econometrics like co integration analysis, error correction models and Granger causality analysis. The problem of spurious regression arises when the variables included in the model are non stationary

and OLS estimates become inefficient. Therefore, an examination of stationarity of variables in time series data is of great importance for best results.

The unit root is the basic test for examining the stationarity properties of the variables. A variable is said to be stationary of its mean, variance and auto covariance remains constant no matter at what point we measure them. In the literature, there are many tests for examining the existence of unit root problem. Dickey and Fuller (1979, 1981) constructed a method for formal testing of non-stationarity. The Dickey – Fuller (DF) is suitable, if the error term (μ_t) is not correlated and it becomes inapplicable if error terms (μ_t) are correlated. As the error term is unlikely to be white noise, Dickey and Fuller has extended their testing procedure suggesting an augmented version of the test that incorporates additional lagged term of dependent variable in order to solve the autocorrelation problem. Akaike information criterion (AI) and or Schwartz Bayesian Criterion (SBC) are used in order to determine lag length on the extra terms. The equation of ADF test may be given as follows.

$$\Delta Y_t = \delta Y_{t-1} + \alpha_t \sum_{t=1}^{m} \Delta Y_{t-1} + \mu_t \qquad \text{(Without drift and trend)}$$

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \alpha_t \sum_{t=1}^{m} \Delta Y_{t-1} + \mu_t \qquad \text{(With drift and no trend)}$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_t \sum_{t=1}^{m} \Delta Y_{t-1} + \mu_t \qquad \text{(With drift and trend)}$$

If it is found that the economic series is non stationary at level and have the same order of integration based on the ADF test, then co –integration technique is used for econometric analysis. Granger (1981) introduced the concept of co integration. Co integration is the statistical implication of the existence of long run relationship between the variables. The co integration in multiple equations can be examined only by Johansen (1981) and Johansen – Juselius (1990) approach. Johansen procedure of co integration gives two statistics. These are the value of LR test based on the maximum Eigen – value and on the trace value of the stochastic matrix.

In order to examine the short run relationships of the model, error correction model is used. Error correction tem included in the model, explains the speed of adjustment towards the long run equilibrium. In addition in the present study, we have applied Granger causality test for examining the causality of the variables.

4. Data Sources and Description of the variables

The present study based on the secondary source of data. It covers the time series period from 1972 – 2008. The major sources of data are Govt. of Pakistan, Economic Survey of the Ministry of Finance (various issues) and the Annual reports of the State Bank of Pakistan (various issues). Besides this, 50 years statistics for Pakistan, published by Federal Bureau of Statistics (FBS) and Financial Statistics of International Monetary Fund are another sources of information. The study has used six variables in the study.

Gross domestic product in million rupees at market prices is used as a proxy for economic growth.

The present research has included two explanatory variables like total labor force in million people and fixed capital formation in million rupees as basic growth accounting variables. The expected effect of labor and capital is assumed to positive. Similarly, agricultural exports and non agricultural exports are considered core variables of the study. The impact of agricultural exports and non agricultural exports may be positive. Consumer price index, the proxy for inflation is used as control variables in the current study.

5. Empirical results and discussion

Before going to provide the detailed but comprehensive econometric analysis, we give the brief interpretation of statistical analysis. Table 1 reports the descriptive statistics and interprets that the average GDP at market prices is 1872152 million rupees with 1878428 standard deviation. The average fixed capital formation is 422736 million rupees. The mean value of labor force is 32.67 million people with standard deviation of 9.73. On the average agricultural exports are 42001.51 and non agricultural exports are 264460.7 million rupees.

Skewness is a measure of departure from symmetry. All the variables included in our analysis are positively skewed or are rightward skewed. Kurtosis measures the peakedness or flatness of the data relative to the normal distribution. The coefficient of Kurtosis of the variables indicate the GDP and labor force (LAB) are plato – kurtic or flat while all other variables in our study have peakedness or lapto kurtic. Skewness and Kurtosis jointly determine whether a random variable follows a normal distribution.

Table 1: Descriptive Statistics

	GDP	CAP	LAB	CPI	AGX	NAX
Mean	1872152	422736	32.67	66.59	42001.51	264460.7
Median	1020600	177646	30.6	46.3	25820	112462
Maximum	5767536	2210921	53.53	223.4	226324	1157394
Minimum	67492	8647	18.78	9.1	3366	5185
Std. Dev.	1878428	584630.2	9.73	53.82	48730.06	328326.6
Skewness	0.83	1.92	0.54	1.11	2.13	1.29
Kurtosis	2.28	5.66	2.29	3.6	7.68	3.55
Jarque-Bera	5.04	33.56	2.54	8.14	61.70	10.77
Probability	0.08	0.00	0.28	0.02	0.00	0.00
Observations	37	37	37	37	37	37

The results of the regression equation (5) indicate that the value of the coefficient determination R^2 exceeds the value of Durbin Watson d statistics i.e. $R^2 > d$ (0.99 > 0.94) that create the problem of spurious regression. In addition, high R^2 and significant t-ratios justify the application of time series econometrics. The main objective of the study is to explore the impact of agriculture exports on economic growth, both in the long run and in the short run. Johansen (1988, 1991) and Johansen – Juselius (1990) tests are useful for this purpose. Once the problem of spurious regression is detected, the next step in the time series econometrics is to examine the stationarity of the variables for determining

the order of integration. For this point of view, we have used the Augmented Dickey Fuller (ADF) test constructed by Dickey and Fuller (1981) to estimate the unit root on all time series variables, both at level and at the first difference of each series with intercept and with trend and intercept.

Table 2: Results of Augmented Dickey – Fuller test (ADF) for unit root

Results of Unit root test with intercept				**Results of unit root test with trend and Intercept**		
Variables	**Level**	**1st differ.**	**Conclusion**	**Level**	**1st differ.**	**Conclusion**
LGDP	-1.354	-2.997	I(1)	-1.273	-3.345	I(1)
LCAP	-0.887	-3.81	I(1)	-3.336	-3.639	I(1)
LLAB	0.225	-3.78	I(1)	-1.807	-3.7904	I(1)
LCPI	-0.352	-4.28	I(1)	-2.302	-4.761	I(1)
LAGX	0.0933	-6.068	I(1)	-3.433	-6.31	I(1)
LNAX	-0.6869	-4.9180	I(1)	-1.1647	-5.2488	I(1)

Note: The null hypothesis is that the series is non – stationary or contains a unit root. The rejection of null hypothesis for ADF test is based on the Mackinnon critical values 5 percent.

Table 2 provides the results of the ADF test which explicitly indicates that all the time series are not found stationary at level even at 10 percent level of significance but the logarithmic transformations of the series are found stationary at first difference and null hypothesis of non stationary is rejected at 5 percent level of significance. In the second step, we determine the optimal lag length. We have chosen optimal lag length by using vector auto regressive test (VAR) based on the value of Akaike information criterion (AIC) and Schwarz criterion (SBC). In our analysis the optimal selected lag length is 2.

Table 3: Unrestricted co integration Rank test (Maximum Eigen value)

Eigen Value	**Likelihood ratio**	**5% critical value**	**1% critical value**	**Hypothesized No. of CE(S)**
0.6861	124.329	94.15	103.18	None *
0.5899	83.775	68.52	76.07	At most 1**
0.5094	52.577	47.21	54.46	At most 2*
0.3348	27.654	29.68	35.65	At most 3
0.3015	13.386	15.41	20.04	At most 4
0.0234	0.828	3.76	6.65	At most 5

* (**) denotes rejection of the hypothesis at 5% (1%) significance level. L. R test indicates 3 co integrating equation (s) at 5% significance level.

After selecting appropriate lag length, we have applied the likelihood ratio test that depends on the Eigen values of the stochastic matrix of the Johansen (1991) procedure for exploring the number of co integrating vectors. Table 3 interprets the results for co integration tests. According to likelihood ratio (LR) test, we have found 3 co integrating vectors at 5 percent level of significance. The null hypothesis of zero co integrated vector is rejected against the alternative of one co integrating vector. Similarly, the null hypothesis of At most 1, and At most 2 co integrating vectors are also rejected against the alternative hypothesis. The analysis concludes that there are three co integrating vectors specified in the model.

Table 4: Normalized Co integrating coefficients: 1 Co integrating equation (s).

Variables	Coefficients	Standard Errors	t – statistics
Constant	1.3098*	0.4821	2.72
LCAP	0.2192*	0.0595	3.69
LLAB	1.7080*	0.6197	2.76
LCPI	-0.3215	0.2679	-1.20
LAGX	-0.1422**	0.0699	-2.03
LNAX	0.5807*	0.0682	8.52

* Significant at 1% level of significance, ** Significant at 5% level of significance

The results about the coefficients of β matrices in terms of normalized co integrating coefficients of 1st equation are reported in the table 4. The long run relationship among the variables is observed in the present analysis. All the variables turn out to be highly significant except inflation (LCPI). The coefficients of all the variables except labor force participation are less elastic. We have found that the capital has correct sign and has direct influence on economic growth. More specifically, an increase of 1 percent in fixed capital formation leads to 0.22 percent increase in Gross Domestic Product and stands less elastic. The result is according to economic theory of investment multiplier. In addition, we have observed that labor force directly influence economic growth. The elasticity of GDP with respect to labor is not only positive but more elastic. The result of the labor force (LLAB) indicates that economic growth increases by about 1.71 percent due an addition of one percent in labor force.

The results of capital and labor (the core factors of production of growth) draw an interesting conclusion. The study reports the less share of capital in economic growth as compared with labor's share in growth. The reason may be that Pakistan is densely populated country and labor force is constantly and consistently growing. As a result, human stock of capital is growing due to expanding education, skill and training facilities and provision of better health facilities even in rural or backward areas of the country. Besides these, investment in education and health has increased in private sector with the co operation of industrially advanced countries. Human capital is considered as the primary source of economic growth.

We have found an inverse relationship between growth and inflation. The coefficient of LCPI is negative (-0.32) and insignificant. The main focus of the present study is on agricultural exports. The elasticity of agricultural exports is negative and less elastic. The

Gross Domestic Product (GDP) decrease about 0.14 percent due to an increase of one percent in agricultural exports. The coefficient of agricultural exports (LAGX) has statistically significant impact on economic growth. The reason may be that agricultural exports of Pakistan are based on primary products rather than finished goods. So, the share of receipts in total balance of payment from agricultural exports is very low and has no sizeable impact on economic growth. Our results are matched with Levin and Raut (1997) that agricultural exports have negligible effect on growth.

The study concludes that non agricultural exports have positive and highly significant influence on economic growth. The non agricultural exports contribute about 0.58 percent in GDP. Out results are compatible with Bairak (1996) and Lopez (2010)'s findings. The reason may be that the non agricultural exports mainly depend upon manufactured or final products whose prices are very high in the world markets. That is why the share of non agricultural exports in foreign exchange earnings is sizeable. So the economic growth is enhanced by non agricultural exports.

Table 5: Results of Error correction model for short run dynamics

Dependent Variable = Δ LGDP					
Independent Variable	**Coefficient**		**t – Statistics**		
Constant	0.122*		3.45		
D(LGDP(-1))	-0.349		-1.38		
D(LCAP(-1))	0.069		0.74		
D(LLAB(-1))	-0.300		-0.72		
D(LCPI(-1))	0.369		1.07		
D(LNAGX(-1))	0.082		0.91		
D(LAGX(-1))	-0.043		-1.32		
Speed of Adjustment ECT(-1)	-0.101*		-2.56		
R – Squared 0.68	**Adj. R – Squared**	0.56	**F – Statistics**		5.86

* Significant at 1 percent level.

We have found long run relationships among these variables, the possibility of short run association may be explored by employing an error correction model (ECM). Error correction model allows the introduction of previous disequilibrium as independent variables in the dynamic behavior of existing variables and thus it is useful in capturing both the short run and long run relationships among the variables.

Table 5 provides the short run dynamic relationship and the set of short run coefficients in the vector error correction model. Error correction model associates the changes in log of Gross domestic product to the changes in other variables and the disturbance term of lagged periods. The coefficient of ECt-1 is negative and highly significant. ECt-1 shows the speed of adjustment. We have observed 10 percent speed of adjustment in the present analysis. It means that 10 percentage points adjustment would take place each year towards the long run period. Agricultural exports have negative effect on growth but it is

insignificant while labor force participation is inversely related with growth and capital and non agricultural exports are directly related with growth.

Table 6: Results of Granger causality test

Pair wise Granger Causality test Sample: 1972 – 2008, lags 2			
Null Hypothesis	**Observation**	**F – statistic**	**Probability**
LAGX does not Granger cause LGDP	35	0.670	0.519
LGDP does not Granger cause LAGX	35	2.149	0.134
LCAP does not Granger cause LGDP	35	1.451	0.250
LGDP does not Granger cause LCAP	35	0.9004	0.417
LCPI does not Granger cause LGDP	35	6.029	0.006
LGDP does not Granger cause LCPI	35	0.184	0.833
LNAGX does not Granger cause LGDP	35	4.799	0.016
LGDP does not Granger cause LNAGX	35	6.574	0.004
LLAB does not Granger cause LGDP	35	3.188	0.056
LGDP does not Granger cause LLAB	35	0.013	0.987
LCAP does not Granger cause LAGX	35	4.379	0.02
LAGX does not Granger cause LCAP	35	1.026	0.371
LCPI does not Granger cause LAGX	35	3.999	0.289
LAGX does not Granger cause LCPI	35	0.604	0.553
LNAGX does not Granger cause LAGX	35	2.609	0.090
LAGX does not Granger cause LNAGX	35	1.374	0.269
LLAB does not Granger cause LAGX	35	9.212	0.001
LAGX does not Granger cause LLAB	35	0.385	0.684
LCPI does not Granger cause LCAP	35	1.422	0.257
LCAP does not Granger cause LCPI	35	6.442	0.005
LNAGX does not Granger cause LCAP	35	2.181	0.131
LCAP does not Granger cause LNAGX	35	2.864	0.073
LLAB does not Granger cause LCAP	35	2.955	0.067
LCAP does not Granger cause LLAB	35	2.002	0.153
LNAGX does not Granger cause LCPI	35	2.756	0.079
LCPI does not Granger cause LNAGX	35	2.796	0.077
LLAB does not Granger cause LCPI	35	3.671	0.038
LCPI does not Granger cause LLAB	35	1.041	0.366
LLAB does not Granger cause LNAGX	35	0.589	0.561
LNAGX does not Granger cause LLAB	35	2.165	0.132

Granger (1969) causality test has been performed in order to examine the linear causation between the concerned variables. Granger causality is useful in determining the direction of the relationships. The test is based on the following model;

$$Y_t = \alpha_0 + \sum_{j=1}^{m} \beta_i Y_{t-j} + \sum_{i=1}^{n} \delta_i X_{t-i} + \mu_t$$

We can say X_t Granger cause Y_t, if the current values of Y_t are determined by past values of X_{t-1}. The test of $H_0 : \delta_i = 0$, can be carried out with F-test. In the view of the Granger, the presence of co-integration vector shows that granger causality must exist in at least one direction.

We have selected the optimum lag length of variables based on AIC and SBC, which is k=2 in the present analysis. Table 6 interprets the results of Granger causality. The study states that there is no directional causality between real gross domestic product and agricultural exports. Moreover, we have found that non-agricultural exports are causing real GDP bidirectional. Labor force participation also causes the real GDP and results in unidirectional causality.

6. Conclusion

The present study is an attempt to examine the contribution of agricultural exports to economic growth empirically. The empirical analysis is based on the time series econometrics. It is found in the current study that all variables are turned out to be non stationary at their level and become stationary at their first difference. The results of Johansen's co-integration test indicate that there exists a long run relationship between economic growth, labor force participation, agricultural exports, non-agricultural exports and fixed capital formation in Pakistan.

The present research concludes that agricultural exports have no effect on economic growth. The economic growth declines as the agricultural exports increases. Further, we have found that non-agricultural exports have significant and positive influence on economic growth. In addition, it is investigated that there is bidirectional causality among non agricultural exports and real gross domestic product.

On the basis of above findings, it is concluded that non-agricultural exports are vital for Pakistan's long term economic growth and development. We suggest that government should take initiatives to promote non-agriculture exports. The exports of non-agricultural products may be enhanced by giving incentives to the producers in the form tax rebates, subsidization, and low cost energy. In addition, the foreign trade pattern and structure should be altered, by reducing the share of basic goods (raw material and semi-furnished products) in exports and raising the share of final products in exports.

Further, it is suggested that government of Pakistan should make structural changes in agricultural exports by converting her agricultural exports into value added products. Pakistan should export textile products instead raw cotton. In order to compete in the international trade markets, local producer should improve the quality of their products. Besides this, government should establish agro-based industries.

REFERENCES

Ahmad, J. and Kwan, A.C.C. (1991). Causality between exports and economic growth. *Economic Letters*, 37, 243-248.

Aurangzeb (2006). Exports, productivity and economic growth in Pakistan: a time series analysis. *The Lahore Journal of Economics*, 11(1), 1-18.

Bahamani-Oskooee, M., Mohtadi, H. and Shabsigh, G. (1991). Exports, growth and causality. *Journal of Development Economics*, 36, 405-415.

Bahmani-Oskooee, M. and Alse, J. (1993). Export growth and economic growth: an application of cointegration and error-correction modeling. *Journal of Developing Areas*, 27(4), 535-542.

Balassa, B. (1978). Exports and growth: further evidence. *Journal of Development Economics*, 5, 181–189.

Balassa, B. (1985). Exports, policy choices, and economic growth in developing countries after the 1973 oil shock. *Journal of Development Economics*, 18, 23–35.

Chenery, H.B. and Strout, A. (1966). Foreign assistance and economic development. *American Economic Review*, 56, 680-733.

Chow, P.C.Y. (1987). Causality between export growth and industrial development. *Journal of Development Economics*, 26, 55-63.

Dawson, P.J. (2005). Agricultural exports and economic growth in less developed countries. *Agricultural Economics*, 33, 145-152.

Dickey, D. and Fuller W. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica*, 49, 1057-1072.

Dodaro, S. (1993). Exports and Growth: A reconsideration of causality. *Journal of Developing Areas*, 27, 227-244.

Dutt, S.D. and Ghosh, D. (1994). An empirical investigation of the export growth-economic growth relationship. *Applied Economic Letters*, 1, 44-48.

Economic Survey. Ministry of Finance, Pakistan (various issues).

Ekanayake, E.M. (1999). Exports and economic growth in asian developing countries: co-integration and error correction models. *Journal of Economic Development*, 24(2), 43-56.

Feder, G. (1983). On exports and economic growth. *Journal of Development Economics*, 12, 59-73.

Ghatak, S., Milner, C. and Utkulu, U. (1997). Exports, export composition and growth: cointegration and causality evidence for Malaysia. *Applied Economics*, 29(2), 213-223.

Granger, C.W.J. (1969). Investigating causal relations by econometric and cross-spectral method. *Econometrica*, 37(3), 424-438.

Granger, C.W.J. (1988). Some recent developments in a concept of causality. *Journal of Econometrics*, 39, 199-211.

Granger, C.W.J., Newbold, P. (1974). Spurious regression in econometrics. *Journal of Econometrics*, 2, 111-120.

Greene, W.H. (2000). *Econometric Analysis.* New Jersey: Prentice-Hall, Inc.

Heller, P.S. and Porter, R.C. (1978). Exports and growth: an empirical reinvestigation. *Journal of Development Economics*, 5, 191-193.

Holman, J.A. and Graves, P.E. (1995). Korean exports economic growth: an econometric reassessment. *Journal of Economic Development*, 20(2), 45-56.

Islam, M.N. (1988). Export expansion and economic growth: testing for cointegration and causality. *Applied Economics*, 30, 415-425.

Jin, J.C. and Yu, E.S.U**.** (1995). The causal relationship between exports and income. *Journal of Economic Development*, 20(1), 131-140.

Johansen, S. (1988). Statistical analysis of cointegration vectors. *Journal of Economic Dynamics and Control*, 12, 231-254.

Johansen, S. and Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with application to the demand for money. *Oxford Bulletin of Economic and Statistics*, 52, 169-210.

Johnston, B.F. and Mellor, J.W. (1961). The role of agriculture in economic development. *American Economic Review*, 51, 566-593.

Jung, W.S. and Marshall, P.J. (1985). Exports, growth and causality in developing countries. *Journal of Development Economics*, 18, 1-12.

Khan, A.H. and Saqib, N. (1993). Exports and economic growth: The Pakistan experience. *International Economic Journal*, 7(3), 55-64.

Kormendi, R.C. and Mequire, P.G. (1985). Macroeconomic determinants of growth: cross-country evidence. *Journal of Monetary Economics*, 16(2), 141-163.

Kugler, P. (1991). Growth, exports and cointegration: An empirical investigation. *Weltwirtschaftliches Archive*, 127(2), 73-81.

Kunst, R.M. and Marin, D. (1989). On exports and productivity: A causal analysis. *Review of Economics and Statistics*, 71, 699–703.

Kwa and Bassoume (2007). Exploring the linkages between agricultural exports and sustainable development. Ecofair trade dialogue [Discussion Paper] No. 2, 1-38.

Levin, A. and Raut, L.K. (1997). Complementarities between exports and human capital in economic growth: evidence from the semi-industrialized countries. *Economic Development and Cultural Change*, 46, 155-174.

Michaely, M. (1977). Exports and growth: an empirical investigation. *Journal of Development Economics*, 4, 49-53.

Michaely, M. (1977). Exports and growth: An empirical investigation. *Journal of Development Economics*, 4, 49-53.

Nadeem, M. (2007). Pakistan Agricultural Export Performance in the Light of Trade Liberalization and Economic Reforms. [Working Papers] 45854, University of Balochistan, Commerce Department.

Oxley, L. (1993). Cointegration, causality and export-led growth in portugal, 1865- 1985. *Economic Letters*, 43, 163-166.

Rahman, M. and Mustafa, M. (1998). Dynamics of real exports and real economic growth in 13 selected Asian countries. *Journal of Economic Development*, 22(2), 81-95.

Ram, R. (1987). Exports and economic growth in developing countries: evidence from time-series and cross-section data. *Economic Development and Cultural Change*, 36, 51-72.

Sanjuan-Lopez, A.I. and Dawson, P.J. (2010). Agricultural exports and economic growth in developing countries: A panel co-integration approach. *Journal of Agricultural Economics*, 61(3), 565-583.

Serletis, A. (1992). Export growth and Canadian economic development. *Journal of Development Economics*, 38, 133-145.

Solow, R.M. (1957). Technical change and the aggregate production function. *Review of Economic and Statistics*. 39, 312-320.

Sprout, R.V.A. and Weaver, J.H. (1993). Exports and economic growth in a simultaneous equations model. *Journal of Developing Areas*, 27(3), 289-306.

Sung-Shen, N., Biswas, B. and Tribedy, G. (1990). causality between exports and economic growth: an empirical study. *Journal of Economic Development*, 15(1), 47-61.

Tyler, W. (1981). Growth and export expansion in less developed countries: some empirical evidence. *Journal of Development Economics*, 9, 121-130.

Ukpolo, V. (1994). Export composition and growth of selected low-income African countries: evidence from time-series data. *Applied Economics*, 26(5), 445-49.

Voivodas, C.S. (1973). Exports, foreign capital inflows and economic growth. *Journal of International Economics*, 22, 337-349.