



Trends and analysis of Pakistan's cash crops export during 1980-2009

Albeena Mirza ¹, Najma Shaikh ¹, Pervez Ahmed Shaikh ², Sobho Khan Jamali ^{1*}

¹ Department of Economics, University of Sindh, Jamshoro, Sindh, Pakistan

² Department of Economics, Lasbela University of Agriculture Water and Marine Sciences (LUAWMS), Uthal, Lasbela, Balochistan, Pakistan

Abstract

This research paper explores the behavior of trends and analysis of export of cash crops of Pakistan by using the data of two main cash crops like Cotton and Rice for the period of (1980-2009). Here in this paper regarding the export of cash crops the data for production of raw cotton in tons and remarkable qualities of Basmati Rice in tons are taken as variables in the model. In addition, the impact of export of both these crops on the employment opportunities in the agriculture sector are discussed, which is back bone of the economy of Pakistan. The research papers of various authors have been studied in this regard to prove the Hypothesis and after in depth analysis by applying Regression Analysis technique it has been observed that the relationship among dependent and independent variables exists. In the addition, it is suggested that the economic growth of Pakistan is inevitable. The growth in agriculture sector particularly in the cash crops of Cotton and Basmati Rice of Pakistan are famous and lucrative products of Pakistan exports and has a huge impact on Pakistan GDP.

Keywords: Exports, GDP, Rice, Cotton, Cash crops, Pakistan

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1. Introduction

A cash crop is one that is produced for sale. It is a commercial orientation of the crop, be it a food or non-food crop that identifies it a cash crop. An export crop is a particular type of cash crop: one that is ultimately exported from a country. The main contributor for the agriculture export are cash crops of every exporter country because cash crops provides a huge accumulation of income from exports and generate big employment opportunities for the people of the country.

Agriculture is back bone of the economy of Pakistan. Agriculture is central to economic growth and development in Pakistan. It is the main income generation sector contributing about 21.4 percent of GDP and 45percent of total employment, 67% of country's population living in rural areas is directly or indirectly linked with agriculture for its livelihood. The healthy expansion in agriculture stimulates domestic demand for industrial goods and other services and supplying raw material to agro-based industry notably cotton textile which is the largest subsector of manufacture sector and also provide paddy to rice husking mill. Summer (Kharif) and Winter (Rabi) are two major crops seasons contributing the crops like wheat , rice ,maize , sorghum , millet, barley, cotton , sugarcane , tobacco, chickpea, lentil, black gram groundnut etc , where wheat , rice cotton , sugarcane, chickpea and maize occupying about 70% of total cultivated area.

But in our study we are focusing on the major two cash crops of Pakistan Cotton and Rice, accounted for 40% of value added in the major crops (wheat, rice, cotton and sugarcane) on average contribute 29.8% to value added in overall agriculture and 6.5% in GDP (www.sbp.org.pk). The value added in major crops accounts for 33.4% in over all agriculture. These two major crops are discussed below with their importance, role, cultivating areas, required temperature, share in GDP and their export markets.

Cotton is considered to be the most important non food cash crop of Pakistan. Cotton is known as the silver fiber of Pakistan. During 1991, Pakistan ranked third globally after USA and China , US produces around 18.7 million bales cotton, China stands at 15.48 million bales and Pakistan in the cotton producing country stands at 9.50 million bales in production and was the first in cotton export. Other important countries in cotton production are India, Russia Mexico, Brazil, Egypt, and Turkey. Pakistan is famous for producing the best quality of cotton in the world. Cotton crop is cultivated in the southern Punjab and Sindh. It brings cash returns to the farmers, supplies raw materials to the textile industry and provides employment in both the rural and the urban areas. Cotton is also providing livelihood to over 5 million people at the farm and industry and trade, furnishes raw material for 1035 ginneries and 441 textile mills and 650 oil expelling units in the country. Thus, in the country cotton plays a vital role in the economic development of the country in both the majors sectors i.e. agriculture and industry. It accounts for 7.3% of value added in agriculture and about 1.6% to GDP. The cotton production was 11.8 million bales in 2008-9. The production of cotton in the recent past has suffered due to shortage irrigation, and attack of leaf curl virus, floods, droughts etc has negatively affected yields.

Rice, a highly valued cash crop earns a substantial foreign exchange for the Pakistan. It is planted about 2.5 hectares annually. The annual rice production averaging 5.0 million tons in recent years has constituted 18% of overall output of cereals and 175 by value added a major crop (Pakistan 2006-7). Rice has two main varieties Basmati and non-basmati rice, accounts or nearly 63% and 37% respectively cultivating rice area in

Pakistan. Pakistan is one of the ten exporting countries that dominate world rice trade. The stable growth of rice production has helped Pakistan to not only meet increasing domestic demand but also have surplus of exports. Pakistan has a comparative advantage in the production of Basmati rice and is a major producer and exporter of this type of rice it is a high export value crop. Basmati rice contains the market in Bahrain, Iran, Kuwait, Mauritius, Oman, Qatar, Saudi Arabia, UK, Yemen, which accounts for about 90% of total export of Basmati rice India is the major competitors of rice for Pakistan. Rice accounts for 5.9% of value added in agriculture and 1.3% in GDP.

Table 1. Cultivated Area Province Wise (Area in Million Acers)

Province	Total area	Net Sown	Current Fallow	Net Sown Area % Cultivated Area
Khyber Pakhtunkhwa	4.45	4.33	0.12	97
Punjab	27.04	26.45	0.58	98
Sindh	7.64	7.51	0.13	98
Balochistan	3.49	2.77	0.72	79
Pakistan	42.62	41.06	1.56	96

Source: Agricultural Census 2010

Table shows the cultivated area by province wise and net sowing area in Pakistan.

1.1. Scope of the study

The main objective of the current study is to determine the significance and analyzing the trend of export of cash crops on GDP of Pakistan. This study is different from that exists in the Pakistan on the basis of data and methodology as well as time period for export of cash crops of Pakistan which include (cotton , rice). To best of our knowledge, no empirical attempt has yet been made in Pakistan to study the significance of cash crops of mentioned above for particular period of 1980-2009. The scope of this study is to determine the importance, trends, role, markets, suggestions for improvements and its effects particularly in exports composition of GDP. The current study covered the data on the two main cash crops Cotton and Basmati Rice in tons in quantity.

1.2. Review of literature

Numerous studies have been conducted by developed and developing countries of the world in the field of agriculture and importance of exports of cash crops and its impact on the economy of the country.

Zulfiqar and Chisti (2010) evaluates about the supply and demand function of the Pakistan wheat sector at national level, model reflects the fact that Pakistan domestic wheat supply is price response and positively effect by use of nutrient fertilizers. While price appears to be a statistically significant factor on supply side and insignificant on very significant in determining total demand for wheat in Pakistan. These results portray the ground realities of Pakistan. Where wheat constitutes essential sizeable proportion of the average persons daily diet.

Salam (2009) has written a lucrative article and focuses on the main policy intervention in the production and marketing of wheat, Rice, Cotton, Sugarcane crops in Pakistan and also estimates incentives/disincentives faced by the farmers in their crop production during 1991-2008, in the study it is suggested that after estimation from the different data that domestic production of wheat, rice has been subject to implicit taxation at times as these crops enjoy protection. In case of cotton domestic production was heavily taxed during 1960s' but in recent years domestic prices have been tracking world prices, cotton is crucial for textile industry so steps may be taken for the improvement. In the study it is also suggested that sugar industry can well served by research and development effort aimed at improving the efficiency of sugarcane production. It is also notified that wheat market witnessed return some old administrative measure 2007-8 in the conclusion it is also suggested that if economic environment of agriculture not improved the requisite farm investment will not occur.

Mukhtar (2009) evaluates the impact of trade liberalization of basmati rice under Doha Round by using a partial equilibrium model price integration analysis, by showing a stable long-run relationship between farm gate price & whole sale price of Basmati and non- Basmati Rice. Direction of the study indicates international price to wholesale price. It is also indicates that when international price & local price of basmati increase there is no doubt that its demand would fall that with change in international trends and environment Pakistan necessary improve its polices for substantial economic performance.

Burki et al. (2006) focuses on the study of wheat and sugar trade between India and Pakistan by using a partial equilibrium analysis to stimulate welfare implications of trade between two countries under alternative trade regime by on Free Trade Area (FTA) between both countries. Real data is used for Fy2005. They have suggested that by a favorable condition both countries can have a surplus for their production. Further analysis reveals that if subsidies to Indian farmers removed, their competitive edge disappears in favor of wheat farmers of Pakistan.

Sangita (2000) identifies some of the main determinants of export in Fiji. She estimates a single equation model in which trading partner income & relative prices lay a certain role. The results indicate that in the long run, trading partner income largely drives movements in Fijis' exports and the short run weather condition, relative prices, industrial disputes and change in foreign demand are mainly influence the exports of the country.

A more recent study of Sharma (2000) investigates export determinant in India using annual data for the period 1970-98. The results of study suggest that demand for Indian export increase when its export price falls in relation to world prices. Furthermore, the real appreciation of the rupee adversely affects Indian exports. Exports supply is positively related to the domestic relative prices of export and higher domestic

demand reduces export supply. Foreign investors appear to have statistically no significant impact on export performance although the coefficient of FDI is positive.

The study of Piermartini (2004) analysis the role of export taxes in the field of primary commodities, the study analysis the impact on export tax on an exporting country and its trading partners, they suggest that effect of an export tax are complex and are not limited to the market of taxed commodity an appropriate application of export taxes as a short run policy measures would require the specification of on explicit time table for their removal.

Narayan and Narayan (2005) investigate the long run relationship b/w Export & Imports for 22 less developed countries (LDCs), they use co integration techniques for this purpose the results indicate that export and Import are co integrated (Long run relationship) only for six out of the 22 countries, and the co efficient less than one.

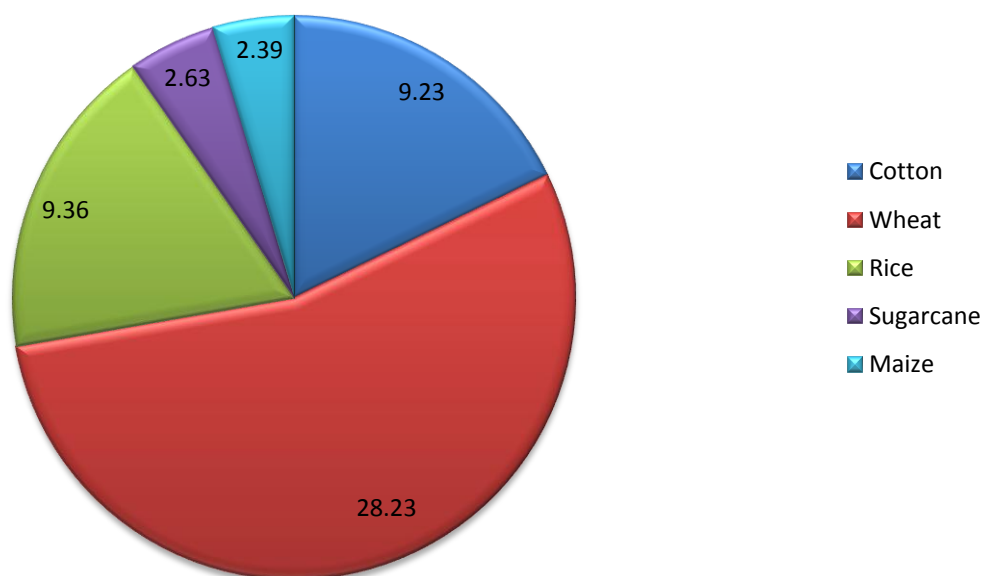


Figure 1. Area under important crops province wise (Area in Million Acres)

Source: Agricultural Census, 2010

1.3. Purpose of the study

The general purpose of this study is to explore the trends and exports of the cash crops of Pakistan and analyze its share in the international trade market and its impact on the employment opportunities and effect on the balance of payments of the country and its behavior in the GDP of the country for the period (1980-2009) particularly.

More specifically, the purpose of this study is to take into consideration the specific role and exports of cash crops of Pakistan (1980-2009) of main cash crops of Pakistan which are cotton and rice.

1.4. Justification of the study

The study is justified on the following grounds:

- 1) The study will be helpful for concerned government authorities like TDAP and private institution will use the research to formulate policies regarding role of cash crops in the economy.
- 2) The findings of our study will be helpful for the agriculturalists/ economists while studying the trend and export of cash crops of Pakistan.
- 3) The Researcher and scholars will use the findings of the study to determine the production of cash crops in the different areas of the country and their role in the domestic food industry and in the export side.
- 4) Research students will also use the study for further refinement and improvement.

2. Research methodology

This research is a library-based research. Secondary data was used to collect and analyze the data, which will be collected from books, journals, research papers, reports, and economic surveys of Pakistan, as well as publications newspapers, and websites of State Bank of Pakistan (SBP).

In order to check data in the model, *Time* data has been gathered for the period of 30 years since (1980 to 2009). Main data source in this regard is the Federal Bureau of Statistics, State Bank of Pakistan. Data is analyzed in a quantitatively way through Regression Model analysis in SPSS and E-views.

2.1. Model

In this, paper the model, which we have selected first to show the impact of economic and financial variables on SBP's Interest rate.

$$GDP = \alpha + \beta_1 (\text{Cotton}) + \beta_2 (\text{Rice}) + \mu$$

Where, GDP is Gross Domestic Product, and Cotton and Rice are agriculture cash crops of Pakistan. GDP is the total market value of all final goods and services produced in a country during a year.

2.2. Hypothesis testing

Hypothesis testing is used to measure the significance of the study.

- H_0 : There is no co relationship among Dependent and Independent variables
- H_a : There is a relationship among Variables

2.3. Statistics work

- Dependent Variable: GDP
- Method: Least Squares
- Date: 04/28/14
- Sample: 130

Table 2. Included Observations 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1762125.	597613.8	-2.948602	0.0065
Cotton	0.467315	1.017835	0.459127	0.6498
Rice	6.192367	0.783849	7.899950	0.0000
R-squared	0.768063	Mean dependent var		1592729.
Adjusted R-squared	0.750882	S.D. dependent var		1890115.
S.E. of regression	943388.5	Akaike info criterion		30.44698
Sum squared resid	2.40E+13	Schwarz criterion		30.58710
Log likelihood	-453.7048	Hannan-Quinn criter.		30.49181
F-statistic	44.70543	Durbin-Watson stat		1.179111
Prob(F-statistic)	0.000000			

Table 3. Model Significance Test (ANOVA^b)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.957E13	2	3.979E13	44.705	.000 ^a
	Residual	2.403E13	27	8.900E11		
	Total	1.036E14	29			
a. Predictors: (Constant), rice, cotton						
b. Dependent Variable: gdp						

- Model: $GDP = \alpha + \beta_1 (COTTON) + \beta_2 (RICE) + \mu$
- $GDP_i = -1762125 + 0.467315 (cotton_i) + 6.192367 (rice_i) + \mu_i$
- Model is significant because p-value < .05

From the result of Regression Model, It has been observed that R was .768 that indicates that the strength of relationship between two variables was strong up to 76%, and the coefficient of determination(R^2) was .75 which means that 75% of the model was explained and the remaining was explained by unknown factors so we reject Null hypothesis and the relationship among the variables exists.

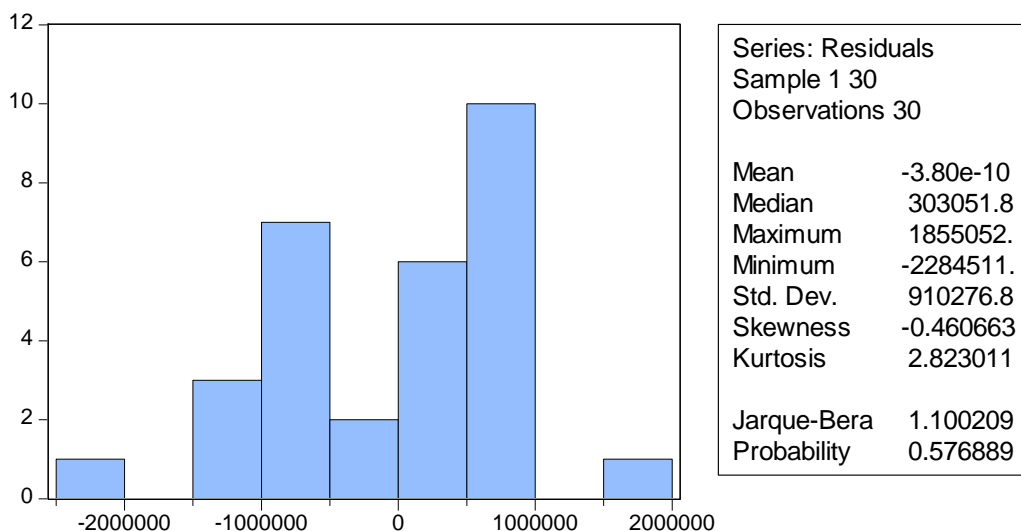


Figure 2. Residuals and Graph

From this graph, it has been concluded that Residuals are normally distributed since the p- value is greater than 5%, the null hypothesis of normally distributed residual is accepted.

Table 4. Breusch-Godfrey Serial Correlation LM Test

F-statistic	2.989981	Prob. F(2,25)	0.0685
Obs*R-squared	5.790804	Prob. Chi-Square(2)	0.0553

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 04/28/14 Time: 11:58

Sample: 1 30

Included observations: 30

Preamble missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	659757.0	655264.2	1.006856	0.3237
COTTON	-0.972119	1.086817	-0.894464	0.3796
RICE	-0.813912	0.839186	-0.969883	0.3414
RESID(-1)	0.456396	0.203993	2.237312	0.0344
RESID(-2)	0.093552	0.219461	0.426281	0.6736
R-squared	0.193027	Mean dependent var		-3.80E-10
Adjusted R-squared	0.063911	S.D. dependent var		910276.8
S.E. of regression	880708.1	Akaike info criterion		30.36585
Sum squared resid	1.94E+13	Schwarz criterion		30.59938
Log likelihood	-450.4878	Hannan-Quinn criter.		30.44056
F-statistic	1.494991	Durbin-Watson stat		1.796403
Prob(F-statistic)	0.233805			

The null hypothesis regarding Serial correlation of data is accepted here because p- value >.05

Table 5. Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.851081	Prob. F(2,27)	0.4381
Obs*R-squared	1.779129	Prob. Chi-Square(2)	0.4108
Scaled explained SS	1.313566	Prob. Chi-Square(2)	0.5185

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 04/28/14 Time: 12:00

Sample: 1 30

Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.05E+09	7.00E+11	0.005782	0.9954
COTTON	779988.9	1192912.	0.653853	0.5187
RICE	1191914.	918678.1	1.297423	0.2055
R-squared	0.059304	Mean dependent var		8.01E+11
Adjusted R-squared	-0.010377	S.D. dependent var		1.10E+12
S.E. of regression	1.11E+12	Akaike info criterion		58.39544
Sum squared resid	3.30E+25	Schwarz criterion		58.53556
Log likelihood	-872.9317	Hannan-Quinn criter.		58.44027
F-statistic	0.851081	Durbin-Watson stat		1.932778
Prob(F-statistic)	0.438090			

The null hypothesis regarding homoskedisity of data is accepted here because p- value >.05

3. Results and discussions

From the results of model, it is concluded that Model is significant because p- value < .05. It has been observed that R was .768 that indicates that the strength of relationship between two variables was strong up to 76%, and the coefficient of determination(R^2) was .75 which means that 75% of the model was

explained and the remaining was explained by unknown factors so we reject Null hypothesis and the relationship among the variables exists. The results taken from the model shows that there is no Heteroskedasticity in the model and it is a good model, the impact of GDP on the Interest rate is negative which shows that One unit increase in GDP results in 2.80% decrease in Interest Rate. The reason for this negative effect is due to impact of interest rate on investment that when interest rate increases the investment decreases and decreased investment leads to decreased GDP, therefore interest rate have an inverse relationship with GDP. In addition, there is positive relationship between interest rate and Consumer Price Index (CPI) the results shows that one unit increase in CPI results .022 % increase in interest rate. The results taken from the model show that there is no hetroskedicity in the model and it is a good model. Two independent variables (GDP and CPI) in the model jointly explain 70% variation in interest rate the remaining 30% variation in the model we failed to capture due to other factors.

4. Conclusion

Here in the light of results and discussion it is suggested that it should moderate the interest rate that is best indicator of GDP rate for long term. In addition, make lucrative and flexible policies for both investors and exporters. Because when there will be easy policies for exporters, than exporters will produce more and more and resultant the employment opportunities will be created, people will engage in production process their per capita income will rise and its impact on overall GDP will be high. Agriculture is the backbone of our economy it must have a strong back through incentives, subsidies for the farmers, owners, producers and so on. It is the responsibility of the government it should launch such type of schemes and programs for the agriculturalists, farmers, exporters which guide them to produce more and more.

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APPENDIX

Raw cotton (quantity in tones)

Basmati rice (quantity in tones)

GDP real Growth rate

Years	COTTON	GDP	RICE
1980	251000	51736	314880
1981	325000	247831	409653
1982	231000	247831	261808
1983	255000	266571	228575
1984	98000	284667	405927
1985	263000	295977	174442
1986	639000	321751	260901
1987	641000	342224	187829
1988	502000	362110	221387
1989	840000	385416	215462
1990	295000	403948	207972
1991	282000	422484	466391
1992	455000	446005	557898
1993	263000	480413	462224
1994	75000	491325	305714

Years	COTTON	GDP	RICE
1995	31000	513635	452300
1996	311000	534861	716392
1997	21000	570157	457245
1998	89000	579865	588763
1999	2000	600125	569823
2000	83000	625233	502061
2001	135000	3562020	550033
2002	35000	3632091	716726
2003	55000	3745118	816339
2004	37000	3942104	814857
2005	117000	4215582	839002
2006	63000	4593230	907906
2007	45000	4860476	1138093
2008	56000	5191710	974274
2009	78000	5565375	1032259

Data source: Economic Survey of Pakistan