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Agriculture sector performance: An analysis through the role of agriculture Sector share in GDP

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In this study, we have analyzed the role of agriculture sector share in Gross Domestic Product (GDP) of Pakistan economy by using time series data from 1975-2012. Ordinary Least Square (OLS) an econometric method is used to estimate the model parameters. For this purpose the study considered several variables such as agriculture, industry, trade and GDP of Pakistan. The results of the study showed positive and significant relation between the GDP and agriculture in Pakistan. Moreover, variables like trade, industry and agriculture have positive relation with GDP growth rate. From the result discussion and conclusion, it may be suggest that Pakistan should make stronger efforts to improve agriculture sector as possible through the reliable policy measure.

Keywords: Agricultural sector performance, role of agricultural sector, GDP

INTRODUCTION

BACKGROUND

The agriculture sector is an important sector of Pakistan's economy. It plays a vital role from various points of view like, share in GDP, employment and foreign exchange earning etc. The development in agriculture sector is necessary because it is an important sector of the economy, which provides the basic ingredients to its population. It is an observed fact that increased agriculture output and productivity tend to contribute substantially to an overall economic development of Pakistan. Therefore, development and sustainable development in agriculture sector is necessary because it is an important and larger sector of the economy. The country's agriculture sector consists of five sub sectors; major crops, minor crops, livestock, fisheries and forestry. The Agriculture Sector of Pakistan consists of Major crops which include rice, cotton, wheat, sugarcane and maize; Minor crops such as masoor, mung, mash, potato, onion and chilies; etc. Two main crop seasons exist in Pakistan namely the Kharif, the sowing season which begins in April-June and harvested during October while the Rabi Season begins in October-December and harvested in April-May. Rice, sugarcane, cotton, maize, mung, mash, bajra and jowar are "Kharif" crops while wheat, gram, lentil (masoor),

tobacco, rapeseed, barley and mustard are "Rabi" crops. In terms of significance Agriculture has been the most important sector for the economy of Pakistan since 1947, the time of Independence. It is still the foundation of the economy as it provides employment to 45% of the population and provides inputs for agro-based industry. Agriculture income has also created demand for industrial goods. Not only that it also contributes raw materials for manufacturing goods and provides market for manufactured products. Not only does the agriculture sector provide food to consumers and fibers to domestic industries, it also is a basis of sparse foreign exchange earnings and offers a market for industrial goods.

Achieving Agricultural growth is important and it can be achieved with an increase in the use of inputs and increasing the productivity. The first component of agriculture growth includes labor, water, land, pesticide and fertilizer consumption which are the vital physical inputs that are being employed in Pakistan's agriculture production process. The second component is the increase in productivity. When speaking of productivity, the growth in total factor productivity (TFP), it is the growth of the total output minus the growth in inputs. This productivity growth is very important as it can be

considered as crucial condition or even a pre-condition for growth to take place in the entire economy.

Similarly, increasing Agricultural growth or productivity is one of the most important determinants of Economic growth and poverty reduction. An increase in Agricultural growth provides direct impact on rural incomes, raising rural incomes and welfare. This rise in rural income raises the overall demand for goods and services in the Economy. Growth in crops also provides food security to the Economy, allowing it to concentrate on the growth of other sectors. Not only that Agricultural growth provides boost to exports which helps stabilize the Exchange rate of the country.

OBJECTIVE

The objective of this study is to analysis the share of agriculture in GDP, because we want to test a hypothesis that what happen to the share of agriculture sector over the time to its contribution.

HYPOTHESIS

Hypothesis of this study are:
$H_{0=}$ Agriculture Sector Performance is not satisfactory.
$H_{1=}$ Agriculture sector performance is satisfactory.

ORGANIZATION

This study consists of various chapters. This chapter is about the study introduction. Chapter two consist review of literature .Chapter three consist of methodology and data. Chapter four consists of results and discussion. Finally, chapter five consists of conclusion and policy recommendation.

Literature Review

Agriculture usually plays a vital role in the economy of every nation that exists. Not only for the reason that it tends to feed the entire population of a country but also in the respect that agriculture correlates and interacts with all the related industries of that country. A country is usually considered to be a social and politically stable nation if it possesses a very stable agricultural basis. Volatility is a hurdle in achieving sustained economic growth which is an important objective of any economy. The pattern of economic volatility in Pakistan is complex and there is no sufficient literature exists to investigate the agriculture volatility. In terms GDP the most volatile sectors are agricultural, industrial and service; while the least volatile are distribution, transport, and communications.

Nazish, Iqbal and Ramzan (2013) have examined the impact of agriculture, manufacturing and service industry on the GDP growth of Pakistan. They employed secondary data and applied multivariate co integration technique. The findings of the study suggested that agriculture, industry, manufacturing and service sector are significantly affecting the annual GDP growth of Pakistan. The result of their study indicates that agriculture sector is more important than other sectors of the economy of Pakistan.

Zaheer (2013) has accessed the performance of agriculture in Pakistan. Researcher used secondary data and his study based on theoretical analysis. This report aims to examined the growth of agriculture sector in Pakistan from 1952-2010.Findings suggest that the growth of agriculture sector has fluctuated over the span of 60 years. Results showed that Pakistan has the lowest growth and factor productivity rate because of problems such as water scarcity, lack of agriculture technology etc.

Matsuyama (1996), empirically tested the impact of agricultural productivity on the long-run economic growth of the contemporary developing countries. He employed Ordinary Least Squares (OLS) and panel data regression Techniques. The theory predicted that the openness of economies negatively affects the gains in the economic growth with the improvement in the agricultural productivity. However, this effect is not strong enough to cause either a long-run negative relationship between economic growth and agricultural productivity.

Hussain et al. (1997) have examined the relationship between aggregate agricultural productivity and poverty in Pakistan through the course of time and along with estimated the determinants of agri. sector production. For the estimation they used Ordinary Least Squares (OLS) method. Their findings showed that increase in agricultural sector production alleviate poverty in Pakistan but not at that rate at which population is increasing. In the case of the determinants of agricultural productivity, their results showed that use of fertilizers played an important role increasing Agriculture production in Pakistan especially in late sixties with the beginning of Green Revolution.

Anthony (2010) has presented an empirical analysis of the impact of agriculture credit on economic growth or the contribution of agriculture to GDP in Nigeria. In order to examine this impact, he specified a functional and operational form, and established a causal relationship between GDP and agricultural variables. His study findings revealed that agricultural variables have significant impact on economic growth and export growth.

Akram et al. (2006) have estimated the long term impact of agriculture credit on growth and poverty in

Pakistan through Co integration and Error Correction Models (ECM) covering the period from 1973 to 2005. They used Gross Domestic Product (GDP), Agricultural GDP, Water Availability, Agricultural Credit, and Number of Tube wells, Number of Tractors, Fertilizer, Seed, Poverty and Rural Poverty variables in their study. Their results showed that the water availability agricultural credit, fertilizer, seed, and tractors have a significant impact in reducing poverty.

Chebbi (2010) has examined the role of agriculture in economic growth with the dealings with other sectors. Multivariate approach has been used to study the cointegration with the other sectors in its country economy and He deeply analyzed how to overcome the problems of spurious regression. He paid the extraordinary attention to investigate non-casualty between agriculture and the other economic sector. Result showed that its all country economic sectors co integrate and have a tendency to move together.

Gollin et al.(2002) have argued that the model of structural Transformation provides a useful theory of both the questions that includes, Why Industrialization occurs at different times and why it considered or proceed slowly. Researchers had shown in its model that low agriculture yield resulted the low operation in the industries side because industries are much dependent on the agricultural yield that helpful to grow an industry in effective manner. If the performance of the industries goes downward that resulted the negative growth in economy.

Levin and Raut (1997) have 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.

Dawson (2005) has 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 nonagricultural exports as inputs. The second model was dual economy model i.e. agricultural and nonagricultural 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 and export have positive related with economic growth. The study suggested that the export promotion policies should be balanced.

Raza et al.(2011) have analyzed the role of agriculture in economic growth of Pakistan. They used secondary data by using OLS method. Results suggested that there is significance role of agriculture sub sector towards the economic growth but only forestry should insignificant relationship with GDP.

Aurangzeb (2006), studied the relationship between economic growth and agriculture 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.

Kawa and Bassoume (2007) have examined the linkage between agricultural exports and sustainable development. The study provided the case studies of different countries that were involved in agricultural exports. Kawa has 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) have estimated the contribution of agriculture exports to economic growth in under developed countries. They estimated the relationship between Gross Domestic Product 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.

Fan et al. (2010) have examined China's Agricultural growth and its implications on China's Economy. Among many other positive impacts, they discovered major contribution of Agricultural growth to Economic growth.

Rattso and Stokke (2003) have analyzed the relationship between the productivity, growth and foreign spillovers for the agriculture and industrial sectors of Thailand. Their analysis found a long run relationship between productivity growth and foreign spillovers in

both agriculture and industry. They emphasized the importance of the development of the Agricultural growth for the growth of other sectors in Pakistan such as the Industrial Sector and Manufacturing sector.

Zaidi (2005), accessed the Agriculture growth trends in Pakistan over the years and found the growth of the Agriculture to be highly dependent on government policies and the political scenario in Pakistan.

Hussain and Qayyum (2008) have examined the relationship between agriculture and GDP growth rate in Pakistan. They employed time series data from 1961-2007.Data has been taken from economic survey of Pakistan. Augmented Dickey Fuller (ADF) has been used for checking the stationarity of data OLS method has been used to show the contribution of agriculture growth rate toward GDP growth rate. Their results show that 1% increase in agriculture growth rate brings 0.34% increase in GDP growth rate.

After the study of all these reviews we concluded that in Pakistan, agricultural growth is great importance and exploring the past trends, problems and implications are important for the development of the Agriculture sector. Similarly, technical progress, technical efficiency and development of human capital in the agricultural sector are many of the important factors for the development of the Agriculture sector. Growth and Productivity are closely linked to each other and both need to be accessed for better analysis.

METHODOLOGY AND DATA

In this chapter, we have presented the methodology and data source about the share of agriculture in GDP of Pakistan economy. The section 3.2 is about framework of analysis, which gives us information about econometric model and variable used in the model to get regression result. Section 3.3 provides information about data sources.

Framework of analysis

In this study, Time series Data is used to analyze the share of agriculture in GDP of Pakistan economy. Regression Analysis (OLS) has performed to get desired result from the study. The basic model is
Y=f (AGRI,TRADE,IND)

Econometric model

To test hypothesis empirically, the role of agriculture on GDP, the model can be specified as follows:
$Y=\beta_0+\beta_1 Agri+\beta_2 Ind+\beta_3 Trade+ \mu_0$

Definition of variables

Y=Gross Domestic Product of Pakistan (annual growth

%).
AGRI= Agriculture share to GDP (annual growth %).
IND= Industry share to GDP (annual growth %).
TRADE = Trade to GDP ratio (annual growth %).

Data and data sources

For the statistical analysis usually two types of Data are used.
(a)   Primary Data
(b)   Secondary Data
For this research essay secondary data (time series data) has been used that would be taken from The Economic Survey of Pakistan (yearly), Agriculture Statistic of Pakistan (yearly) and World Development Indicators (WDI).

REGRESSION RESULTS AND DISCUSSION

This study discusses the Pakistan Agriculture Sector Shares in GDP. At the Time of independence agriculture's share of GDP was about 50% and its share of the labor force was 66%. In 1970's agricultural share of GDP declined to 37% and this was due to the fact that industrial share grew more rapidly. The share of agriculture in GDP decline over the time and reached 30% in 1980's. The declining trend of the agricultural sector in GDP has continued in the remaining time period

Estimation Result

This section presented estimated model, which is specified in previous chapter, time series data is taken for analysis by OLS estimation technique to estimate the model. Stata has been used to check the significance of parameters of the estimated model. t-test is used to check the significances of the variables. The results are:
The table 1 is evidence of regression results. The value of R-square is a statistical measure of how close the data are to the fitted regression line, the value of R-Square indicate that approximately 76% variation in dependent Gross domestic product (GDP) of Pakistan are explained by the independent variables (Trade to GDP %, Agriculture Sector to GDP %, Industry to GDP %). F. value shows that over all models is good fitted. As per expectation the GDP of Pakistan is positively and affected trade but not play an important role. GDP is incorporated to take into custody the factors associated with the intensity of economic growth. Results also postulate that the agriculture sector of Pakistan has positive and statistically significant influence in GDP. The results indicate that an increase in agriculture share of Pakistan by 5%, GDP of Pakistan would resultantly

Table 1: Agriculture Sector Share in GDP of Pakistan (1975-12)

Explanatory Variables	Coefficients	t. statistics	Sig….
Constant(β_0)	-1.29***	7.15	0.000
Trade	.085	1.23	0.435
Agriculture	.399**	1.96	0.061
Industry	.621**	1.81	0.007
F. Statistics	16.01***	-------	0.000
R-Square	.762	-------	-------
Adjusted R-square	.714	-------	-------

Note: (***) for 1% level of Significance (**) for 5% level of Significance (*) for 10% level of Significance.

Table 2: Correlations

Variables Name	GDP	TRADE	AGRI	INDUSTRY
GDP	1.00	– – –	– – –	– – –
TRADE	0.39	1.00	– – –	– – –
AGRI	0.53	0.05	1.00	– – –
INDUSTRY	0.26	0.40	0.25	1.00

increase by 39%. These results could be explained in exports led development prospective for Pakistan. On the other hand other determents of GDP industrial sector is also positive correlated with GDP and play a significant role in the economic performance of Pakistan.

Correlation Test

The study applies the time series data approaches, therefore occurrence of correlation, is possible. Table 2 indicates that there is no perfect correlation between all variables under consideration. The correlation value varies from 0.04 to 0.80 in model that is not very high (Gujarati, 1988 and Judge, *et.al.,* 1988) consider 0.80 to be the critical threshold for serious problem of correlation.

CONCLUSION ANDPOLICY OPTION

The empirical analysis of the study can be concluded that Pakistan has better performance regarding agriculture over the last above sixty years of its history. For the country, the notion of food security should move beyond a relatively static focus on food availability. Higher agriculture growth, particularly emanating from the crop sector, will provide food security by increasing supply, stabilizing prices, and raising incomes of poor-farm households.
Moreover, the overall economy sustainable development largely depends on the sustainable process of development in agriculture sector. One side it's substances mean rapid production process by talking all asserts into consideration and other side sustainable development through 'clean products' means economic

development for the sake of progress, for the sake of standard of living, for the sake of satisfying. The needs of our community and our market-both at national and global levels.

The main purpose of the study is to investigate the role of agriculture sector share on Gross Domestic Product (GDP) in Pakistan for the period of 1975-2012 .For the investigation we used OLS estimation technique to show the relationship between dependent (GDP) and independent variables(trade, industry and agriculture). Using OLS estimation technique the following conclusions are drawn. Firstly the parameters estimate for Industry, trade and agriculture are showing positive and significant relation with GDP growth rate. This suggest that there is a need to enhance trade, Industry and agriculture as they found for promotion of economic growth. This implies that an increase in trade, industry and agriculture can increase the GDP of Pakistan

Policy options

For the development of agriculture sector there is a need of both reforms (structural and technocratic) with commercialization and modernization in the sector. It will increase the production level in the sector and become a source of both goods; industrialization will create more employment and less inflation. With the development process in the sector if economy achieves more production and employment with low inflation, is also considered as sustainability. For sustainability of agricultural crops production it is necessary to starts various reforms in the sector i.e. reforms about crops production, basic, infrastructure, extension services and mechanization.

The recent global food crises, while creating difficulties for net food importing countries, is equally providing opportunities for developing countries like Pakistan to get their acts together and benefit from the current situation by giving more serious attention to agriculture base industries. To get benefit from current global food crises, Pakistan needs to change its policy-orientation from the current practice of focusing exclusively on price and move towards yield enhancement and address, structural issues such as poor crop management skills of formers; use of cheaper seed; lack of agriculture infrastructure and higher post _harvest losses; limited research as well as the gap between research and practical applications; and inadequate funding for research and development.

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