Impact of Government Expenditure on
Agricultural Sector and Economic Growth in Pakistan

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Abstract: The basic aim of this study is to examine the impact of Government expenditure on agricultural sector and economic growth in Pakistan over the period 1983-2011 with time series data collected from Pakistan Statistical Year Books and Economic Survey of Pakistan, 2015. The present study applied Augmented Dickey–Fulle (ADF) unit root test, Johansen Co-integration test and Ordinary Least Square (OLS) technique as analytical tools to analysis the data. The results of Johansen Co-integration test showed that there exists a long-run relationship between Government expenditure on agriculture, agricultural outputs and economic growth in Pakistan. On the other hand, the empirical results of regression analysis revealed that agricultural outputs, Government expenditure have significant influence on economic growth in Pakistan. It was also found out that agriculture sector is still confronting some challenges like inadequate funding, underdeveloped agriculture marketing, poor infrastructure and shortage of irrigation etc. Therefore, it was recommended that Government of Pakistan should increase its expenditure in the development of agriculture sector since it would enhance agricultural productivity and economic growth.

Key words: Government expenditure · Economic Growth · Pakistan

INTRODUCTION

Many studies have been made on impact of Government expenditure on agriculture and economic growth. The agriculture sector contribution to economy is not too much to consider for building sustainable development, but play the role of employment, export potential and financial impact on the economy. Agriculture is an important and dynamic sector of Pakistan economy. During the period of 2014-2015, gross domestic product (GDP) as percent of fiscal deficit was at 3.8 percent against 3.9 percent during 2013-2014. Total expenditure was 5642.4 billion Rupees, comparing of 4462.3 billion Rupees of current expenditure and 1180.1 billion Rupees for development expenditure and net lending. Net lending and development expenditure grew by 6.9 percent during the period of 2014-2015 and reached to 594.0 billion Rupees against 555.8 billion in the same period in 2013-2014. Overall development expenditure made a remarkable growth with the ratio of 23.4 percent. Similarly in 2014-2015, total revenues increased with the ratio of 8.3 percent and stood at 2682.6 billion Rupees as compared to 2013-2014 was 2477.4 billion Rupees. But tax revenue posted a negative growth of 10.4 percent during 2014-2015 amounted to 619.5 billion Rupees [1, 2].

In today's world, the agriculture sector acts as a catalyst, accelerating the pace of restructuring and diversified economy that depends less supply of foreign agricultural products or raw materials to economic growth and sustainable development. The agriculture sector contributes mainly to the nation's development in aspect of enhancing government revenue; infrastructural growth, living standards and also contribution to Gross National Product (GNP). According to Mitchell [3] the economic theories do not automatically generate the accurate result about the effect of government expenditure on economic performance. Most of the

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experts agree that there are some circumstances in which low level of government spending would enhance economic growth and other huge level of government spending would be desirable.

Barro [4] shows that some components of government expenditure are productive and some are unproductive. Health and education expenditure increase the productivity of labour as well as growth of national output. Education is one of the backbone factors that determine the quality of labor. In the sense of economic growth; Government expenditure on health are essential to human capital and agricultural growth. Good investment in the agriculture sector; especially in the form of food security, is important for human existence. While, the financial sources of public expenditure in the taxation form, decrease the taxpayers benefits and also reduces benefits associated with economic growth. Akpan [5], Romer [6], Gregorious and Ghosh [7] pointed that the association between public expenditure and economic growth has continued to create a series of controversies. While, other researchers concluded the impact of Government expenditure on economic growth is insignificant, some shows that effect is significant and positive.

In developing countries public expenditure is the main instrument of Government to promote economic growth which is necessary element for agricultural development. Growth in economic sector brings a better living standard of people through provision of better infrastructure, education, health and improvement in agricultural productivity and food security [8].On the other hand, the hypothesis of Keynesian shows that government expenditure development accelerates the economic growth. Government Expenditure is regarded as a dynamic force that makes changes in aggregate [9].With increasing or cutting Government taxes, Government can offset a low pace of economic activity [10, 11].

Objective of the Study: The aim of this research is to investigate the impact of Government expenditure on agricultural sector and economic growth in Pakistan over the period 1983-2011.The findings of the study will be useful for the Economic Planners who are responsible for allocating budgetary for the growth and development of agriculture sector.

Research Question: What is the influence of Government expenditure on agricultural sector of Pakistan?

Hypothesis

H_0: Government spending has no significant effects on agricultural sector and economic growth in Pakistan.

H_1: Government spending has a significant effect on agricultural sector and economic growth in Pakistan.

Government Expenditure an Existing Review of Literature: Agriculture is the backbone of any country economy; in broad sense it comprises the entire range of agricultural technology related production of plants and animals, including crop production, soil cultivation and livestock [12]. However, Yasin [13] pointed that the association between Government expenditure and agricultural growth in 26 sub-Sahran African countries. On the basis of neoclassical production, he developed an economic model. From 1987 to 1997, author used the panel data and using fixed effect and random effect. Alshahrani & Alsadiq [14] indicated that the effect of different categories of Government expenditure on agricultural and economic growth in Saudi Arabia and concluded the long-run and short-run impacts of the expenditures on growth using different econometric techniques and tools particularly Vector Error Correction Model. They used time series data from 1969-2010, arouse the growth in long-run.

Case *et al.* [15] and Figlio *et al.* [16] showed that the economical perspective depending on the public spending type, local government fretful about how their expenditure compare with others and incline to assume positions that are viewed improved than their neighbors. Francis 2013, examined the federal government expenditure impact on agricultural sector, he used the data from 1991-2010 and applied Simple regression with analyzed data which indicated the impact of agricultural expenditure output. He concluded that government should support its fiscal allocations to the agriculture sector, distribution of funds and monitor agricultural inputs to farmers for creation of commodity markets.

Butkiewicz & Yanikkaya [17], Wahab [18] found out that the government expenditure impact on economic growth that emphasize how government efficiency and influence the productivity of government spending. More than 100 developing and developed countries are included in the data set by using Seemingly Unrelated Regression (SUR) methods to evaluate a model. Nurudeen & Usman [19] and Hsieh & Lai [20] attempted to see the connection of economic growth and Government

expenditure in seven countries; Canada, Germany, France, Japan, United Kingdom, Italy and United State of America. They suggested that the growth and Government expenditure relationship can fluctuate significantly through time. Their empirical results shows that no vigorous evidence of progressive impact of government expenditure on growth.

A study by Udoh [21] estimated the relationship between private investment, public expenditure and agricultural output growth in Nigeria from the period of 1970-2008. The author used Autoregressive distributed lag (ARDL) model and error correction model to analysis the data. The empirical findings of his study show that the government expenditure has a positive and progressive effect on the development of the agricultural output.

Attari & Javed [22] studied the relationship between rate of inflation, agricultural growth and government expenditure in developing countries; i.e. Pakistan. They disaggregated government expenditure into the government current expenditure and the government development expenditure. They used time series data during the period of 1980-2010 and applied different econometric techniques. The result shows that the current government expenditure coefficient is statistically insignificant, but development expenditure coefficient is statistically significant. In short, the economic growth is not effected by rate of inflation and government expenditure remains. They argued that the developing countries government faced a lot of issues, like allocation and utilization of resources.

From the above mentioned empirical review of literature on the impact of government expenditure on agriculture and economic growth of Pakistan are very difficult to find out. Therefore, this present research contributes to this debate by providing further empirical evidence on the impact of government expenditure on agricultural sector and economic growth of Pakistan over the period 1983-2011.

MATERILAS AND METHODS

Data Source: The determination of the study is to examine the impact of Government expenditure on agricultural sector and economic growth in Pakistan for the period of 1983-2011.The study has been used time series data for the variables, gross domestic product (GDP) at constant price, agricultural productivity and Government

expenditure on agriculture, collected from Pakistan Statistical Year Book (various issues) and Economic Survey of Pakistan. Agricultural Productivity reflects the output of the sub-sectors such as major and minor crops, livestock, fishery and forestry of the sector in Pakistan.

Specification of Model: The study is to find out the effect of Government expenditure on agricultural sector and economic growth: a case study of Pakistan for the period of 1983-2011.The following specified model is estimated: Harrod-Domar Model Y= F (K, L)

Ln GDP= F (Ln AGROPT, Ln GEXP)

Where:
Ln RGDP= Natural logarithm of Real Gross Domestic Product in (million rupees)
Ln AGROPT= Natural logarithm of Agricultural Output in (million rupees)
Ln GEXP = Natural logarithm of Government Expenditure in (million rupees)

The empirical model in its stochastic form is presented as;

$$GDP = \beta_0 + \beta_1 AGROPT + \beta_2 GEXP + \mu$$

Where,
GDP= Gross Domestic Product
β_0 = Intercept
β_1 = Coeffient of Agriculture Output
β_2 = Corffient of Government Expenditure
μ = error term

This empirical research is based on time series data over the period 1983-2011. Multiple linear regression analysis of Ordinary Least Square (OLS) an econometric technique was applied to analyze the data. The Augmented Dickey Fuller test (ADF) and Phillips-Perron test (PP) were utilized to check the stationarity of the series. Based on the results of ADF test and Phillips-Perron test, Johansen-Co-integration test [23, 24] was applied for estimation.

Figure 1, 2 and 3 shows the trend of the three variables under investigation i.e GDP, Agricultural Output and Government Expenditure on Agricultural Sector in Pakistan over the period 1983-2011.
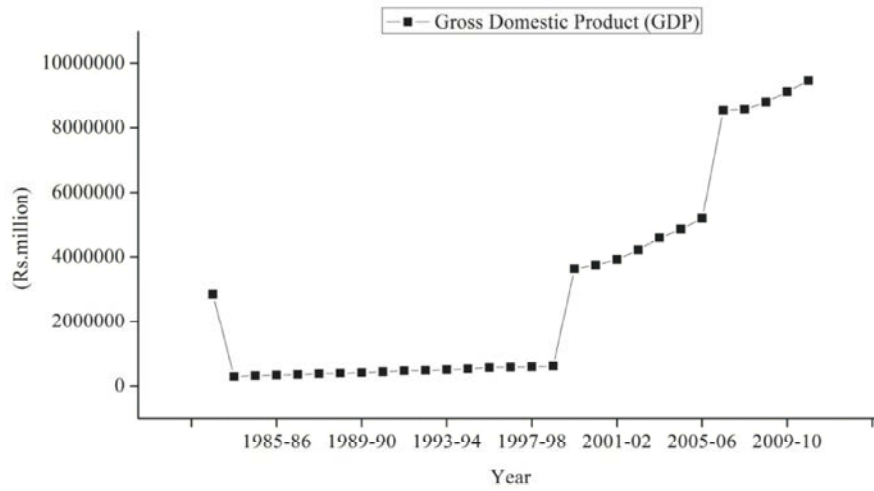
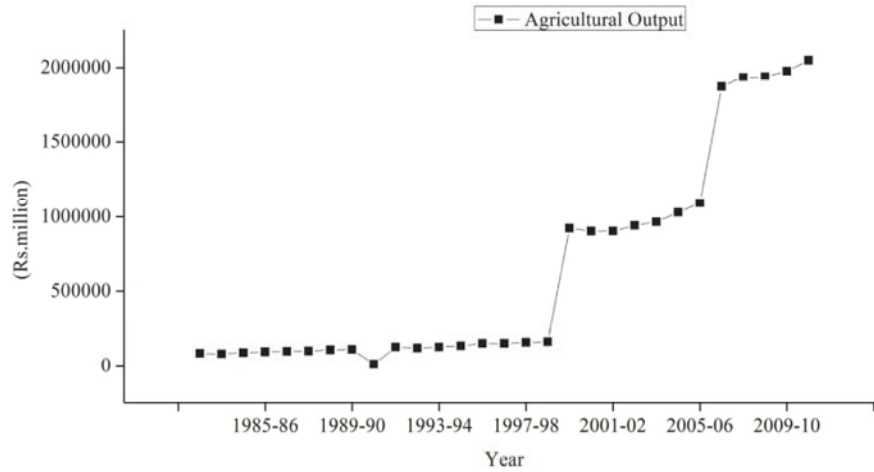Fig. 1: Gross Domestic Product (GDP) of Pakistan from 1983-2011.

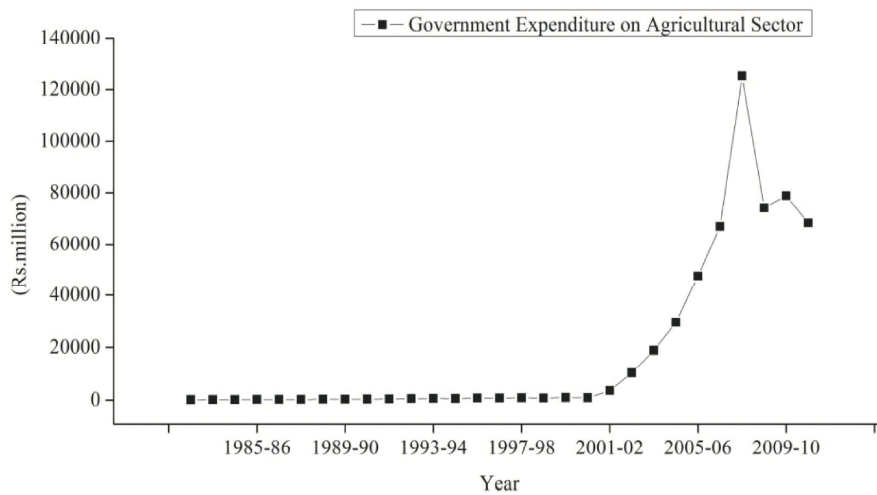Fig. 2: Agricultural Output of Pakistan from 1983-2011.

Fig. 3: Government Expenditure on Agricultural Sector of Pakistan from 1983-2011.

RESUTS AND DISCUSSIONS

Results of Augmented Dickey–Fulle (ADF) Unit Root Test: The stationarity of the data has been checked by utilizing the ADF and Phillips-Perron tests. The estimated results of the ADF test and Phillips-Perron test are presented in (Tables 1 and 2) indicates that all variables (AGROTPT, GEXP and GDP) are not stationary at level their level 1(0), while all variables became stationary after taking the first difference I (1), as showing less than 0.05 by their probability values. The computed ADF statistics test and Adj. t-Stat test are higher than critical values at both 1% and 5% level of significance.

The Results of Johansen-co-Integration Test: The long-term relationship between the dependent variable (GDP) and independent variables (AGROPT and GEXP) have been checked by applying the Johansen Co-integration test. The results of the Johansen Co-integration tests are presented in Tables 3 and 4. The values of Trace statistic (39.70087) and the values of Max-Eigen statistic (25.04953) which are higher than their critical values (29.79707), (21.13162), which showed that there exists a long-term relationship between government expenditure, agricultural outputs and economic growth in Pakistan. This rejects the null hypothesis of no co-integration. In both, the Trace statistic and Max-Eigen statistic tests indicates one and two co-integrating equation at the 5% level.

Table 1: ADF Unit Root Test at Level & 1st Difference

Variables	At level		First difference	
	t-Statistic	Critical values	t-Statistic	Critical values
LnAGROTPT	-0.537392	1% -3.699871	-7.770598*	1% -4.339330
	(0.8687)	5%-2.976263	(0.0000)	5% -3.587527
		10% -2.627420		10% -3.229230
LnGDP	-0.691113	1%-3.689194	-8.577304*	1% -3.699871
	(0.8332)	5% -2.971853	(0.0000)	5% -2.976263
		10% -2.625121		10% -2.627420
LnGEXP	-2.044461	1% -4.323979	-5.295750*	1% -4.339330
	(0.5528)	5% -3.580623	(0.0011)	5% -3.587527
		10% -3.225334		10% -3.229230

Note: *, **, *** indicates 1%, 5%, 10% level of significance respectively

Source: Author's own calculation using Eviews 9.

Table 2: Phillips-Perron Test at level & 1st Difference

Variables	At level		First difference	
	Adj. t-Stat	Critical values	Adj. t-Stat	Critical values
LnAGROTPT	-0.844018	1% -3.689194	-9.941904*	1% -3.699871
	(0.7906)	5% -2.971853	(0.0000)	5% -2.976263
		10% -2.625121		10% -2.627420
LnGDP	-0.720976	1% -3.689194	-9.015199*	1% -3.699871
	(0.8254)	5% -2.971853	(0.0000)	5% -2.976263
		10% -2.625121		10% -2.627420
LnGEXP	-2.044461	1% -4.323979	-5.295972*	1% -4.339330
	(0.5528)	5% -3.580623	(0.0011)	5% -3.587527
		10% -3.225334		10% -3.229230

Note: *, **, *** indicates 1%, 5%, 10% level of significance respectively

Source: Author's own calculation using Eviews 9.

Table 3: Johasan co-integration test using Trace Statistic

Eigen value	Trace statistic	5 % Critical value	Prob**	Hypothesized No. of CE(s)
0.604562	39.70087	29.79707	0.0026	None *
0.417800	14.65133	15.49471	0.0667	At most 1
0.001700	0.045930	3.841466	0.8303	At most 2

*denotes rejection of the hypothesis is at the 0.05 level.

Trace test indicates 1 co-integrating equation at the 0.05 level

Source: Author's own calculation using Eviews 9.

Table 4: Johasan co-integration test using Max-Eigen Statistic

Eigenvalue	Max-eigen statistic	5% Critical value	Prob**	Hypothesized No.of CE(s)
0.604562	25.04953	21.13162	0.0133	None *
0.417800	14.60539	14.26460	0.0442	At most 1 *
0.001700	0.045929	3.841466	0.8303	At most 2

*denotes rejection of the hypothesis is at the 0.05 level.

Max-eigenvalue test indicates 2 co-integrating equation at the 0.05 level

Source: Author's own calculation using Eviews 9.

Table 5: Regression Analysis

Dependent variable: ln(GDP)				
Method: Least squares				
Sample: 1983 2011 included observations: 29				
Explanatory variables	Coefficient	Std. Error	t-Statistic	Prob.
C	5.991621	1.447717	4.138670	0.0003
Ln (AGROPT)	0.575994	0.140833	4.089902	0.0004
Ln (GEXP)	0.095830	0.040986	2.338137	0.0273
R-squared	0.861372	Adjusted R-squared	0.850708	
Durbin-Watson stat		1.487943		
F-statistic	80.77589	Prob(F-statistic)	0.000000	

Source: Author's own calculation using Eviews 9.

The Results of Regression Analysis: To analyse the effect of Government expenditure on agriculture and economic growth in Pakistan, Ordinary Least Squares Model was employed. The estimated results of regression analysis are presented in Table 5 to determine the association between gross domestic product (GDP and two explanatory variables. The equation of the fitted model is:

Ln (GDP) = + 5.991621
Ln (AGROPT) = + 0.575994
Ln (GEXP) = + 0.095830

The high values of R^2 and Adjusted-R^2 suggest that over 86 percent change in the gross domestic product (GDP) were described by the independent variables. The value of F-statistic is calculated 80.775 with the probability values of 0.000000 which indicates that the overall model is significant.

Since independence (1947) the agriculture sector has played a significant role in Pakistan's economy. It contributes about 20% towards GDP. This sector provides raw materials to agro-based domestic industries and it is a main source of export earnings. The elasticity coefficient of Agricultural output has a positive value of 0.57 and is statistically significant at both 1% and 5% significance level. The results imply that a 1 percent increase in agricultural output economic growth increased by 0.57% tremendously. In addition, the empirical results show that Government spending has a significant impact on the economic growth of Pakistan. The elasticity of government spending has a positive value of 0.09 and significant at 5% significance level. This reveals that a 1 % increase in Government expenditure will increase

economic growth in Pakistan nearly 0.09%. The results are according to Bhatia [25], Musaba *et al.* [26], Iganiga and Unemhilin [27] and Yee *et al.* [28] found out positive relationship between government expenditure on agricultural sector and economic growth.

CONCLUSION AND RECOMMENDATIONS

The present study investigated the impact of Government expenditure on agriculture sector and economic growth in Pakistan for the period 1983 to 2011; we modelled gross domestic product (GDP) against agricultural outputs (AGROPT) and Government expenditure on agricultural sector (GEXP). Augmented Dickey-Fuller test, Johansen Cointegration test and Ordinary Least Squares Method were employed to analyze the data. From the findings of the study it can be concluded that the Johansen Co-integration test showed that a long-run relationship exists between agricultural outputs, public expenditure on agricultural sector and economic growth in Pakistan. Regression analysis showed that the agricultural outputs and public expenditure on agricultural sector have a positive impact on economic and agricultural growth in Pakistan; therefore rejecting the null hypothesis i.e. that the result of Government expenditure has no significant impact on the agricultural sector and economic growth in Pakistan and alternatively we accept the alternative hypothesis that Government spending have a significant impact on economic growth in the agricultural sector of Pakistan. In particular, a 1 percent increase in agricultural outputs will increase economic growth in Pakistan by 0.57%. Furthermore, the empirical results revealed that a 1 percent increase in public expenditure on agricultural sector will increase economic growth in Pakistan almost by 0.09%. Based on the empirical findings the study recommended that government should increase adequate Government spending for the development of agriculture sector and it can leads economic growth.

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