

**IMPACT OF MONETARY POLICY  
RATE AND CREDIT DISBURSEMENT  
ON AGRICULTURE SECTOR GROWTH  
OF PAKISTAN**

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LIMITED**

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## **ABSTRACT**

The study is aimed at focusing impact of monetary policy rate and agriculture credit disbursement by formal credit sources along with other variables on Agriculture Gross Domestic Product of Pakistan. Variables used in the study are monetary policy rate, agriculture credit demand/disbursement, subsidy on fertilizer, labor employed in the sector, food export. The study is based on secondary data. Data for these variables is time series for 1993 to 2017 which have been obtained from Agriculture Statistics of Pakistan Yearly Book, Pakistan Economic Survey and Monetary Policy compendium. ADF test was applied to check stationarity of data. OLS approach has been used to compute the results. Regression analysis shows that monetary policy rate, food exports, agricultural land, employment in agriculture have positive and significant relationship with AGDP while subsidy on fertilizer and agriculture credit disbursement have positive but insignificant impact on AGDP.

## **1. INTRODUCTION**

Agriculture sector has an important role in the economy of Pakistan as it contributes 18.9 percent to the Gross Domestic Product. It is the largest single component of total GDP and about 42.3 percent of the labor force is related to agriculture sector. In order to develop the agriculture sector, the Government of Pakistan has taken many initiatives which include crop diversification, changes in cropping patterns, efficient usage of water resources, use of modern technology, provision of agriculture credit through formal channels, and provision of subsidy on fertilizers in order to reduce cost of production. In Pakistan's history, share of agricultural sector to GDP was 60 percent in 1949-1950 that decreased to 30 percent in 1978-1979, 20 percent in 2006-2007 and further to 18.9 percent in 2017-18. Agriculture sector has grown at an average rate of 4.1 percent per annum since 2002-2003 and experienced continuous variations from 6.5 percent to 1.1 percent from 2002-2003 to 2007-2008 and during the year 2017-18, it was recorded at 3.81 (Economic Survey of Pakistan, 2017-18).

Prior to 1972, commercial bank's lending to agriculture sector was nominal. Majority of credit to this sector was being provided by the Agricultural Development Bank of Pakistan (now ZTBL). Introduction of Banking Reforms in 1972 resulted in several institutional and policy changes. The objective of these reforms was more equitable distribution of bank credit among various sectors and groups. Agriculture sector was also a beneficiary of these policy reforms.

Supply of agricultural credit plays an important role in the development of rural economy. Availability of agricultural finance helps in the commercialization and modernization of agriculture sector (Riaz, Khan & Ahmad, 2012). Studies reveal that the agricultural sector assists the development of allied industries and other non-agricultural sectors where the agricultural products are used as raw materials creating effective demand for other industrial

products. These incentives in demand and supply lead to industrial growth, which stimulates economic growth in the country (Subramaniam and Reed, 2009).

Inadequate use of better-quality technologies and equipment has been found as a foremost factor resulting in low agriculture sector productivity in developing countries (Simtowe, Zeller, and Diagne, 2009). The use of improved inputs, such as fertilizer, farm mechanization facilities, and seeds are key player in modernization of agricultural sector, (Binswanger and Khandker, 1995). The availability of timely and adequate credit will provide access to better quality inputs. The farmers are unable to purchase quality inputs due to limited access to credit facilities thus serving as a major challenge in the agricultural production process (Simtowe et al., 2009; Tadesse, 2014).

In order to improve the quality and quantity of farm products, provision of credit facilities is necessary as better quality and yield increases farmer`s income and reduces the chance of rural migration. On the other hand, some policy makers believe that payment of credit with low interest rate to farmers can support them against some results of development policies that threat their welfare (Ghorbani, 2005).

Monetary policy generally refers to the deliberate efforts of the government to use changes in money supply, cost of credit, size of credit and direction of credit to influence the level of economic activities to achieve desired macroeconomic stability in an economy (Chigbu and Okonkwo 2014). According to Folawewo and Osinubi (2006), monetary policy objectives for most economies include price stability, maintenance of balance of payment equilibrium, promotion of employment and output growth, and sustainable development. Interest rate determined in monetary policy of any country impacts the agricultural industry by affecting the cost of borrowing money, investment decisions and values of farmland. Interest rates affect

agricultural markets in three major ways, costs of holding inventory, effect on investment decisions such as land, machinery and input purchases and overall farm business risk associated with possible rising interest rates.

The literature discussed earlier throws light on impact of different components i.e. agriculture credit, availability of farm inputs and latest technology on agricultural productivity. However, this study focuses on sensitivity of agricultural credit demand and monetary policy rate on agricultural GDP of Pakistan.

Despite increase in supply of agricultural credit by formal banking channels, the share of agriculture sector in the GDP is reducing in case of Pakistan. The current study will investigate the impact of monetary policy rate given by SBP and agriculture credit disbursement on agriculture sector growth in Pakistan.

### **1.1. Objective of the Study**

The objective of this study is to find the effectiveness of monetary policy and agriculture credit demand on the agriculture sector growth of Pakistan. However, the specific objectives include:

- a) To determine the effect of monetary policy rate on the agriculture sector growth.
- b) To determine the effect of agriculture credit supply on agriculture sector growth.

In this study only those funds are considered that have been borrowed from formal credit sources like specialized agricultural banks, commercial banks and microfinance banks. But in the rural areas of Pakistan there are many farmers who take credit from the informal sources, therefore future researches should consider the informal credits as well. Informal credit has a higher cost than formal credit.

This study can benefit policy makers especially in allocation of agricultural credit disbursement targets and provision of subsidy.

## **2. LITERATURE REVIEW**

State Bank of Pakistan determines the monetary policy rate. The impact of banking rates in agriculture reflects on the volume of agricultural credits. If the interest rates for agricultural credit are high, the access to the credit is more restricted. When the interest rates for agricultural credit are small, many farmers can access credit and the volume of the agricultural credits increases. Banking rates in agriculture are influenced by the monetary policy interest rate. The fluctuation of the monetary policy interest rate is in an inverse proportionality relation with the fluctuation of the credit volume. The reduction of the monetary policy interest rate may lead to an increase of the volume of credits granted to banks. The lower the interest, the customers can access a larger volume of credits (Harangus, 2012).

Bernanke and Blinder in 1988 introduced the bank loan supply as a new variable to the traditional IS-LM framework. They provided the evidence for the existence of the bank lending channel. They found that whenever there is a tight monetary policy, aggregate lending by all banks decreases. According to their findings, if money-demand shocks are more important than credit-demand shocks, then a policy of targeting credit is probably better than a policy of targeting money.

Carrera (2011) found that tight monetary policy reduces the bank loan supply. Bernanke and Blinder (1992) justified this negative relationship as monetary tightening affects bank loan supply because banks refuse to make new loan contracts when old are expired. Kashyab and Stein (1995) compared the behavior of large and small banks against tight monetary policy. They concluded that small banks reduce their lending more as compared to large banks because

large banks have power to neutralize the impact of monetary tightening. They get funding from issuance of commercial paper, equity etc.

Kashyab and Stein (1997) found that monetary policy has major impact on banks having less liquid assets on balance sheet items including cash ratios and securities. Similarly, by using the data for the period 1990 to 2002, Alfaro (2004) concluded that small banks and banks with less capital are more affected by monetary policy.

Agricultural credit access increases farming efficiency, as it allows farmers timely use of farm inputs and application of new and modern technology which ultimately increase output of the farms improving the growth of agriculture sector (Ayaz, Hussain and Sial, 2010).

Awan and Vashma (2014) tried to find out the major determinant of agricultural sector and mutual relationship between agriculture economic development and GDP, how agriculture helped in economic development, 31 observations were used since 1980 to 2010. Gross domestic product and agriculture growth were taken as economic variables. Data were taken from the World Bank Meta data of Pakistan. Co integration and vector error correction model was used as econometric technique for measuring the variable relationship. Results show that there exists statistically significant and positive relationship between agriculture growth and GDP growth. It was suggested that the role of agriculture growth for GDP and economic growth is very essential.

Awan (2012) tried to analyze the growth of agriculture sector in Pakistan and total factor productivity of agriculture growth in Pakistan by employing the Tornqvist- Theil index number methodology for the period of 1971 to 2006. Labor, land, fertilizer off take, capital, fodder, wheat and pesticide consumption are the inputs used in construction of agriculture input index,

while output categories for index measuring were minor crops, major crops and important vegetables and fruits. Outputs and inputs categories data were collected from the various issues of Economic Survey of Pakistan and various issues of agriculture statistics of Pakistan. Results shows that during the 70s decade total factor productivity growth rate was lowest and during the last six years 2001 to 2006 of the study total factor productivity was at his highest at 2.86 percent. Further results explained that share of total factor productivity growth in total agriculture output growth was 33 percent and during last six years of the study is measured by eighty three percent.

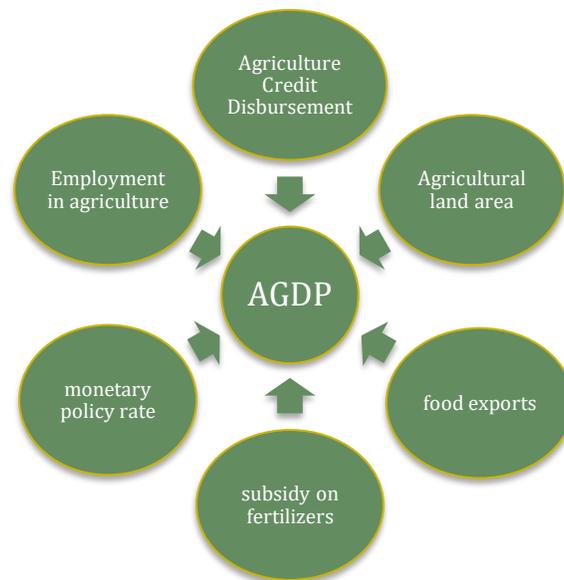
Awan and Sheikh (2015) estimated the impact of supervised agriculture credit on small income farmers, and try to increase their farm income in the study area and also conducted the effect of credit on land use and cropping intensity of the project area. Primary data was collected the year of (1997 to 1998) through the interviews. Farm income, Yield per acre of respective crop, operational holding, number of animals, used as variables and a multistage random sampling technique was applied in project area. T test, percentage analysis and multiple regressions was used for statistical estimation.

Khalidi and Sherazi (2013) found that labor, capital and total productivity have significant effect on value added products in Iranian agricultural sector. Camelia (2015) shows utilized agricultural area has major impact on agricultural output growth in Romania after its integration with European Union.

Hamid and Ahmad (2006) analyzed the major factors which were responsible for agricultural growth and productivity. The variables included in study were value added in the agricultural output(y), labor employed in agriculture (L), capital stock in agriculture (K), intermediate inputs

in agriculture (IP) and level of technology (A). Cobb-douglas production function was used to estimate the results. Results show a negative impact of technological change and efficiency on employment generation prospects in agriculture sector of Pakistan.

## 2.1.Theoretical Framework



## 2.2.Research Hypothesis

*Ho: Monetary policy rate does not have impact on agriculture GDP of Pakistan.*

*H<sub>1</sub>: Monetary policy rate has impact on agriculture GDP of Pakistan.*

*Ho: Agriculture Credit distribution does not have impact on agriculture GDP of Pakistan.*

*H<sub>1</sub>: Agriculture Credit distribution has impact on agriculture GDP of Pakistan.*

## 3. DATA AND METHODOLOGY

### 3.1.Data

This study is based on secondary data. The study explores the impact of monetary policy rate and the demand of credit by agriculture sector on overall agriculture sector performance in Pakistan over the period of 1993–2017. Annual time series data has been collected from the Pakistan Bureau of Statistics, the Statistical Year Books, the Economic Survey of Pakistan

(various statistical supplements) and monetary policy compendium of State Bank of Pakistan. The dependent variable is Agricultural Gross Domestic Product (AGDP) (in million rupees) while independent variables used in this study are: Monetary policy rate, Agriculture credit demand (disbursement), subsidy provided by government on fertilizers, Agricultural land (% of land area), Employment in agriculture (% of total employment) and Food exports (% of merchandise exports).

### 3.2. Econometric Model

In order to test the hypothesis empirically, the impact of interest rate, agricultural credit disbursement/demand, agricultural land, food exports, employment in agriculture sector and subsidy provided by government on fertilizers on agricultural GDP, the model can be specified as follows:

$$AGDP = f(AGRIDIS, MP RTE, FOOD EXP, EMPLY, SUBSDY, LAND)$$

$$AGDP_t = \alpha_0 + \alpha_1 AGRIDIS_t + \alpha_2 MP RTE_t + \alpha_3 FOOD EXP_t + \alpha_4 EMPLY_t + \alpha_5 SUBSDY_t + \alpha_6 LAND_t + \mu_t$$

Where,

t= 1993-2017.

AGDP = agricultural GDP (as a % of GDP) at time t

MP RTE = monetary policy rate at time t

FOOD EXP = Food exports (% of merchandise exports) at time t

EMPLY = Employment in agriculture (% of total employment) at time t

SUBSDY = Subsidy on fertilizers at time t

LAND = Agricultural land (% of land area) at time t

### 3.3. Unit-Root and Order of Integration Analysis

**Table 1: Evidence of stationarity using Augmented Dickey Fuller Unit Root Test for all the data series**

Variable	Level(P-Value)	First Difference(P-Value)
Agricultural GDP	0.4401	0.0072
Agricultural Land	0.4404	0.0083
Agricultural credit Disbursement	0.9984	0.0084
Monetary policy rate	0.7745	0.0054
Employment in agriculture sector	0.2992	0.0000
Subsidy	0.0552	0.0002
Food exports	0.6232	0.0000

In order to check the stationarity of the data, all the variables were tested for unit root. For this purpose, the Augmented Dickey – Fuller (ADF) Test, prepared by Dickey and Fuller (1981), was used. The null hypothesis of a unit root was not rejected (5% significance level), in any of the series, when tested at different levels. Therefore, all the series were non-stationary. But unit root hypothesis was rejected while tested at first difference for all the series (Table 1). The results show that the series are integrated at the first order,  $I(1)$ . Since all the series are at the same order, the data set is appropriate for further analysis.

**Table 2: Regression Analysis using OLS**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-70.18182	14.47703	-4.847805	0.0001
EMPLY	0.203341	0.077485	2.624275	0.0172
LAND	1.610939	0.294546	5.469221	0.0000
MPRATE	25.25139	5.945428	4.247194	0.0005
SUBSDY	0.003723	0.016092	0.231382	0.8196
AGRDIS	2.17E-07	1.65E-06	0.131329	0.870
FOOD EXP	0.396343	0.089310	4.437844	0.0003
R-squared	0.798093	Mean dependent var		23.04064
Adjusted R-squared	0.730791	S.D dependent var		1.317671
S.E of regression	0.683678	Akaike info criterion		2.308836
Sum Squared resid	8.413477	Schwarz criterion		2.650121
Log likelihood	-2.186045	Hannan-Quin criter		2.403494
F-statistic	11.85835	Durbin-Watson stat		1.715253
Prob(F-statistic)	0.000021			

### 3.4. Regression Analysis

After checking the stationarity of data, the model was estimated using Ordinary Least squares (OLS) method. The large value of F-statistics shows that the explanatory variables included in the model collectively have significant influence on agricultural GDP. The high  $R^2$  and Adjusted- $R^2$  values suggest that 80% variations in the agricultural GDP are explained by the explanatory variables included in the model. The coefficient for agricultural credit is positive and insignificant at 5 percent level and suggests that institutional credit have no significant impact on agricultural production. Similarly, subsidy on fertilizers has positive and insignificant impact on agricultural GDP which means that subsidy provided by government on fertilizers is very less in value and it fails to bring any significant impact on AGDP although it's an important factor for agriculture productivity. Monetary policy rate has a positive and significant impact of agricultural productivity showing that when interest rate is high, more institutional credit is supplied by formal credit sources to the farmers that results in provision of finances to farmers bringing an increase in agricultural productivity. Employment in agriculture, agricultural land area and food exports have positive and significant impact on agricultural GDP. The estimate for the coefficient of Employment is very close to that estimated by Zuberi (1989). However, it is much smaller than that estimated by Qureshi and Shah (1992). The results of coefficients of Land are consistent with the results of Hussain and Ishfaq (1997) and study of Camelia (2015) who stated that the size of the cropped area as well as fertilizer off-take played very important role in increasing agricultural production historically.

**Table 3: Descriptive Statistics**

	<b>AGDP</b>	<b>SUB</b>	<b>MPRATE</b>	<b>LAND</b>	<b>FOODEX</b>	<b>EMPL</b>	<b>AGRIDISB</b>
<b>Mean</b>	23.04064	10.25001	0.114272	46.93570	14.06437	44.49016	202216.0
<b>Median</b>	23.19580	3.700000	0.100000	46.92300	12.28010	43.49300	108732.4

<b>Maximum</b>	25.30310	50.60000	0.200000	47.96080	19.95130	50.05600	704488.0
<b>Minimum</b>	20.21970	0.046700	0.057500	45.71660	8.981000	41.01000	15674.05
<b>Std. Dev.</b>	1.317671	13.15613	0.038545	0.634213	3.847979	2.559940	209817.2
<b>Skewness</b>	-0.181816	1.699287	0.474141	-0.232873	0.335427	0.633965	1.024261
<b>Kurtosis</b>	2.614979	5.376951	2.504959	2.474294	1.472322	2.110274	2.857910
<b>Jarque-Bera</b>	0.292156	17.91688	1.191983	0.513839	2.899838	2.499229	4.392329
<b>Probability</b>	0.864090	0.000129	0.551016	0.773430	0.234589	0.286615	0.111229
<b>Sum</b>	576.0161	256.2502	2.856800	1173.393	351.6092	1112.254	5055400.
<b>Sum Sq. Dev.</b>	41.67014	4154.008	0.035657	9.653441	355.3667	157.2790	1.06E+12
<b>Observations</b>		25	25	25	25	25	25

**Table 4: Covariance Matrix**

	<b>SUB</b>	<b>MPRATE</b>	<b>LAND</b>	<b>FOODEX</b>	<b>EMPL</b>	<b>AGRIDISB</b>	<b>AGDP</b>
SUB	1.000000	-0.232307	-0.488480	0.687568	-0.346774	0.521047	0.166164
MPRATE	-0.232307	1.000000	-0.238772	-0.519721	0.656335	-0.670346	0.187872
LAND	-0.488480	-0.238772	1.000000	-0.332335	0.071093	-0.209666	0.206291
FOODEX	0.687568	-0.519721	-0.332335	1.000000	-0.563873	0.871024	0.351167
EMPL	-0.346774	0.656335	0.071093	-0.563873	1.000000	-0.661081	0.226189
AGRIDISB	0.521047	-0.670346	-0.209666	0.871024	-0.661081	1.000000	0.148127
AGDP	0.166164	0.187872	0.206291	0.351167	0.226189	0.148127	1.000000

Study also does the diagnostic test to find the possible problem in the data.

**Table 5: Diagnostic Tests**

<b>Checks</b>	<b>LM version</b>	<b>Probability(<math>\chi^2</math>)</b>
<b>Serial Correlation(<math>\chi^2</math>)</b>	2.9069	0.2339
<b>Heteroskedasticity (<math>\chi^2</math>)</b>	2.2364	0.8967

Table 5 shows that all p-values of relevant test are greater than 0.2, so there is a strong evidence that there is no problem of serial correlation and heteroskedasticity in the model. Error term of model is normally distributed and functional form of our model is correct.

#### **4. CONCLUSION**

Agriculture production is the major source of income for the majority of household in Pakistan where most of the population is engaged with agriculture and its allied activities. This study was designed to explore the impact of monetary policy rate, agriculture credit disbursement, subsidy

on fertilizers, agricultural land, agri employment and food exports on share of agriculture in Gross Domestic Product.

It is evident from the study that monetary policy rate, agricultural land area, subsidy on fertilizer, employment in agriculture, agricultural credit disbursement and food exports positively affected AGDP. Total land area, monetary policy rate and employment are the most significant among these variables. Moreover it is evident that demand for agri credit from formal sources remains regardless of increase in monetary policy rate as Pakistan is an agro based economy and more than half of the famers are small/micro famers and they depend on formal credit disbursements. It is observed that subsidy and agriculture credit demand are affecting AGDP in a positive manner but insignificantly. However majority of the Pakistani farmers are not in a position to secure key inputs from their own sources. Thus, subsidies on agricultural inputs (particularly on fertilizers) and agriculture credit disbursement are of great importance. The basic purpose of agri credit disbursement and subsidy is to finance the poor or marginal farmers, but in Pakistan it is observed that a huge amount of subsidy has been caught by the larger farmers. The need of the hour is to channelize subsidy and agriculture credit disbursement in such a way that small and subsistent farmers can also get benefit from Government policies. Moreover, all the farmers get equal amount of fertilizer without considering the degree of land fertility. Generally, high fertile land needs low amount of fertilizer to get higher productivity. If the subsidy granted on the basis of fertility of land then it would increase the productivity of crops. The basic purpose of agricultural subsidies is to stabilize food prices, food production, guaranteeing farmer's basic incomes and strengthening the agricultural sector of the economy. Agriculture subsidies can affect the prices, demand, supply and productivity of agriculture products. Credit requirements of the farming sector have

increased rapidly over the past few years especially during 2007 onwards mainly due to increase in agri prices and food exports.

## **5. POLICY RECOMMENDATIONS**

In order to enhance the impact of these variables on AGDP, the following steps can be taken:

- i. Uncultivated lands may be brought in use and a piece of land can be used for more than one purpose for cultivating the crops.
- ii. An agricultural credit card scheme should be initiated with credit limit (Kharif and Rabi seasons) based on productivity of the land he/she is cultivating and other assets as collateral. At least 20-25 percent of this limit may be allowed as consumption loans especially, during bad years. The amount of loans obtained and repaid should be kept on deducting or adding to this limit automatically.
- iii. It is recommended that secure credit on easy terms and conditions should be encouraged with strong monitoring and agricultural extension services. However, appropriate and supervised credit scheme for credit disbursement must be demand driven too.
- iv. Training programs for farmer's education may be organized. Further there exists strong need of enhancing value chain services in the country to facilitate farmers from pre-harvest to post-harvest processes. This will lead to increase in agricultural production.
- v. The private sector credit institutions should be encouraged to provide farm inputs to farmers.
- vi. Fertilizers and other inputs should be made available on subsidized rates in order to facilitate the farmers and decrease their cost of production.

- vii. Schemes like e-credit and solar tube well should be encouraged to decrease cost of production which is one of the significant issue of the farmers leading to decrease in the productivity.
- viii. Key factor behind the Green Revolution was introduction of the new varieties through the production of seed. It is imperative for the government to give maximum attention to their sustainable supply for the overall as well as agricultural growth.
- ix. To overcome the crisis in the agriculture sector, the institutional framework for irrigation, seed development, and extension services would have to be rationalized. Allocating more finances is not enough but improving the management capability of the institutions is important too, as it can enable a high and stable agricultural growth in future.

## **6. FUTURE SCOPE OF THE STUDY**

Future researchers may observe the impact of change in monetary policy rate on demand for agri credit disbursement from informal sources and its ultimate impact on share of agriculture in Gross Domestic Product.

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