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Impact of Financing on Production with Mediating Role of Rural Population: Evidence from Agricultural Sector of Pakistan

Abstract

The aim of this study is to investigate the relationship between agricultural financing and agricultural production in the context of Pakistan. Data regarding agricultural production and agricultural financing from 1995-2016 were taken from the Economic Survey of Pakistan. Descriptive statistics, correlation analysis and Ordinary Least Square techniques were applied to analyze the impact of agriculture finance on agriculture production. From the findings of the study, it is reported that agricultural financing has a positive and significant impact on agricultural production even in the presence of rural population as mediator. Hence the current study contributes a valuable addition to the available literature in the context of Pakistan.

Keywords: *Agricultural Financing, Agricultural Production & Rural Population.*

1. Introduction

Agriculture sector of Pakistan like the other developing countries is the backbone of the economy because of 2/3 of population employment associated with the agriculture sector. In addition, agriculture sector also contributes 25% to the gross domestic product (GDP) and 65% of the total exports. In this study, the agriculture sector was taken as dependent (Y) variable and further divided into three dimensions including the production of essential crops, livestock and production of fruits, and then each dimension divided into different elements. Elements of crops including wheat, rice, bajra, jowar, maize, barley, gram, sugarcane, rapse, sesamum, cotton and tobacco. The share of major crops such as wheat, cotton, sugarcane, rice and maize is 25.6% of total agriculture output, and contribution of major crops in GDP is 5.3%. The share of minor crops like bajra, jawar, gram, tobacco, oilseed, sunflower, rapeseed, mustard plants, canola moong, mash, masoor, onion, chillies and potato is the 11.1% of total agriculture output and contributing 2.3% towards the GDP. (Economic Survey of Pakistan, 2014-15).

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The dimensions of livestock divided into milk, beef, mutton, poultry meat, wool, hair, bones, fats, blood, eggs, hides and skins. In the fiscal year 2014-15 share of livestock sector 56.3% to the agriculture value added and 11.8% share in GDP. In 2014-15 an increase of Rs. 801.3 billion was observed as compared to 2013-14. Being the world 3rd largest producer of milk, Pakistan not only fulfilling the domestic needs of the country but also earning foreign reserve. Besides all these, livestock sector employing 8 million families in rural areas (Economic Survey of Pakistan, 2014-5). Citrus, mango, apple, banana, apricot, almonds, grapes, guava are the elements of fruits that are taken as a sample of the study. By producing the different crops (wheat, rice, bajra, jawar, maize, barley, cotton), livestock items (milk, beef, mutton, poultry meat, fats) and fruits (Citrus, mango, apple, banana) agriculture sector fulfil the food requirements and needs of people. He also added that agriculture sector is not fulfilling the food needs of people but also providing the employment to the rural and urban population (AdamS & Fitchett, 2016).

In this study, agriculture finance was taken as the independent variable (X) that based on the credit facility provided by the formal institution including ZTBL, Domestic Banks, Punjab Provincial Cooperative Bank Ltd (PPCBL), Commercial Banks, Microfinance Banks and Islamic Banks. According to Iqbal et al. (2003) ZTBL, Domestic Private Banks, Punjab Provincial Cooperative Bank Ltd (PPCBL), Microfinance Banks and Islamic Banks are the primary sources of formal credit for the farmers. In this rural study population also taken a mediating variable (MV). Data regarding all variables were taken from the Pakistan Bureau of Statistics like other developing countries in Pakistan productivity and efficiency of agriculture sector can be enhanced through the availability of adequate and timely credit facility.

2. Review of Literature

In Pakistan majority of farmer fail to enhance their agriculture output due to unavailability of suitable credit facility, lack of latest technology and lack of latest machinery (Malik, 1999). Productivity and efficiency of agriculture sector depend upon high yielding seeds, fertilisers and plant protection measures (PPM) and all the input required timely credit facility. The efficient credit market provides an opportunity to the farmers to enhance their agriculture production by using the latest equipment and high yielding seeds and pesticide (Feder et al., 1990). Sial & Carter (1996) conducted a study to find out the impact of agriculture finance on agriculture output. In this study, they found a positive and significant relationship between agricultural finance and agriculture output. They also mentioned that in their study output of borrowed farmer was 48% more as compared to the non-borrower farmer.

Habib (2015) suggested that for the survival, growth and stability of agricultural sector it is compulsory for every government to make a policy to fulfil the credit requirements of the rural farmer because the agriculture production can be enhanced through a rapid and timely credit facility. According to the study, agricultural sector playing a pivotal role in the country economy. In 2014-15 the shared of agriculture sector in GDP was 20.9% and employment of 43.5% rural population linked with the agriculture sector. Agriculture sector considered as the

backbone of the economy and significant portion of GDP based on the agriculture sector in most of developing countries like Pakistan (Maqsood and Khalil, 2013). Unavailability of credit facility leads to lack of agriculture machinery that is resulting in adverse effect on agriculture production. (Iqbal et al., 2015).Agriculture credit ensured availability of agriculture input that leads to enhancement in agriculture production (Hashmi et al., 2015; Khaliq et al., 2016). Formal credit fulfils the credit needs of 50% of farmer whereas credit needs of other farmer fulfil through the informal sources including friends, relative etc. (Singh, 2016).

Agriculture finance is the most critical factor that is used to improve the efficiency of the agriculture sector. In developing countries like Pakistan, farmers can enhance their agriculture production through the provision of fast and timely credit facility. In this study, the positive and significant relationship between agriculture finance and agriculture production was observed (Rehman et al., 2014). Uncertainty regarding agriculture production or output is the major issued of Pakistan and most of the farmer in Pakistan facing this problem. These problems exist because due to political and nepotism small farmer fails to get the credit facility (Abdullah et al., 2015). Due to political forces and unavailability of collateral or securities majority of small farmer fails to get the credit facility that is resulting in less agriculture output in the form of crops, livestock and fruits production (Yuansheng et al., 2016). Ansari (2001) suggested that latest agriculture machinery essential element for better agriculture output. Latest machinery is beyond the capacity of small farmers. Therefore, availability of latest machinery and equipment for a small farmer can be ensured through the provision of fast and timely credit facility. He also mentioned that agriculture credit should be provided for crops production, livestock production and fruits production.

3. Material & Methods:

In this study agricultural finance (X) was taken as an independent variable, agriculture production (Y) was taken as dependent variable whereas rural population was taken as mediating variable (MV). Mediating variable (MV) was taken by multiplying the agriculture finance with the rural population.

Data regarding all the observed variables from the financial year 1995-2016 was taken in this study. Data regarding all variables including agricultural finance (X), agricultural production (Y) and mediating variable (MV) was taken from the Pakistan Economic Survey. Different descriptive statistics techniques including mean, median, maximum, minimum and standard deviation used to observe the normality of data.

Correlation analysis techniques used to observe the relationship between dependent variable agriculture production (Y) and independent variable agriculture finance (X). Ordinary Least Square (OLS) method used to measure the intensity of dependent variable (Y) and independent variable (X) in the presence of rural population (MV).Following research, model was drawn to observe or to investigate the relationship between independent variable agricultural finance (X) and dependent variable agriculture production (Y) in the presence of rural population (MV).

3.1 The hypotheses of the Study:

On the basis of previous studies and previous literature following hypothesis has been developed.

H_1 There is a relationship between agriculture finance (X) and agriculture Production (Y) in the context of Pakistan.

H_2 Change in rural population has a moderate impact on agriculture finance (X) and agriculture production (Y) in context of Pakistan.

4. Results & Discussions

Table No. 1 Descriptive Statistics:

Descriptive Statistics	X (Agriculture Finance)	Y (Agriculture Production)
Mean	5.245	3.709
Median	5.346	3.713
Maximum	5.712	3.768
Minimum	4.651	3.622
Std. Dev.	0.347	0.043

Table No. 2 Correlation Analysis:

Variables	X (Agriculture Finance)	Y (Agriculture Production)
X (Agriculture Finance)	1	0.837
Y (Agriculture Production)	0.837	1

The above-cited results indicate a positive and significant relationship between dependent variable agriculture production (Y) and independent variable agricultural finance (X). Now the Ordinary Least Square (OLS) model can be applied to observe the impact of agriculture finance (X) on agriculture production (Y).

Table No. 3 Research Model I: Statistical Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	3.164	0.095	33.236	0.000
Agriculture Finance (X)	0.103	0.018	5.728	0.000
R-squared	0.700	*F-statistic*		32.814
Adjusted R-squared	0.679	*Prob(F-statistic)*		0.000
Akaike info criterion	-4.471	*Durbin-Watson stat*		1.969

Note: Dependent Variable: Agriculture Production (Y).

The estimated regression line for model-I is (See above mentioned Table).

Y = 3.164 + 0.103 (**X**)

Y is the total agriculture production "000" of tons, where 3.164 is the intercept, and 0.103 is the coefficient of agriculture finance (X). The slope of the line was measure through the $\beta 2 = 0.103$. The above-cited regression line indicates that average agriculture production (Y) will increase 0.103 thousand tons as we increase agriculture finance (X) by Rs. 1 million. The value of $\beta 1 = 3.164$, that is the intercept of the regression line, representing the average level of production of agriculture production (Y) when the value of agriculture finance at zero level. Value of adjusted R^2 is 0.679 (With P-Value < 0.05) it means 67.9% change in agriculture production (Y) comes through agriculture finance (X). Above mentioned results indicate a positive and significant relationship between dependent variable agriculture production (Y) and agriculture finance (X).

Table No. 4 Research Model II: Statistical Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	3.011	0.121	24.713	0.000
Agriculture Finance*Rural population (MV)	0.095	0.016	5.731	0.000
R-squared	0.701	*F-statistic*		32.844
Adjusted R-squared	0.679	*Prob(F-statistic)*		0.000
Akaike info criterion	-4.472	*Durbin-Watson stat*		1.970

Note: Dependent Variable: Agriculture Production (Y).

The estimated regression line for model-II is (See above Mentioned Table).

Y = 3.011 + 0.095 (**X**)

Y is the total agriculture production "000" of tons, where 3.011 is the intercept, and 0.095 is the coefficient of agriculture finance (X). The slope of the line was measure through the $\beta 2 = 0.095$. The above-cited regression line indicates that average agriculture production (Y) will increase 0.095 thousand tons as we increase agriculture finance (X) by Rs. 1 million in the presence of the mediating variable (Changes in rural Population)s. The value of $\beta 1 = 3.011$, that is the intercept of the regression line, representing the average level of production of agriculture production (Y) when the value of agriculture finance at zero level. Value of adjusted R^2 is 0.679 (With P-Value < 0.05) it means 67.9% change in agriculture production (Y) comes through agriculture finance (X) in the presence of mediating variable (Change in rural population). Above mentioned results indicates that positive and significant relationship between dependent variable agriculture production (Y) and agriculture finance (X) was observed in the presence of mediating variable (Change in rural population).

5. Conclusions & Policy Implications

The basic aim of research work is to investigate the relationship between agriculture finance (X) and agriculture production (Y) by using the data from 1995 to 2016. Data was collected from the economic survey of Pakistan. Descriptive statistics, correlation analysis and Ordinary Least Square (OLS) model, applied to observe the impact of agriculture credit (X) on agriculture production (Y).

Findings of the study indicate that agriculture finance (X) has a significant and positive impact on agriculture production (Y) with the presence of rural population (MV) in the context of Pakistan. Results of this study guide the policymakers for consideration of rural population vital role while understanding the impact of financing on agricultural production.

Findings of this studies is consistent with the findings of previous studies conducted by Adams & Fitchett (2016), Habib (2015), Maqsood and Khalil (2013), Iqbal et al.(2015), Khaliq et al.(2016), Boston(1997), Hussain and Tami (2014), Khan et al.(2011), Noonari et al.(2016), Rehman et al. (2014), Bashir et al. (2010), Riaz et al. (2012), Olagunju (2007), Arif (2001), Mushtaq & Rauf (2011), Vogt (1978) and Inayat (2007).

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