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The Impact of Agriculture Credit on Growth in Pakistan

Nadeem Akmal (Senior Scientific Officer, Social Sciences Research Institute, NARC, Islamabad- Pakistan)

Bushra Rehman (Assistant Scientific Officer, Social Sciences Research Institute, NARC, Islamabad- Pakistan)

Akhtar Ali (Senior Scientific Officer, Social Sciences Research Institute, NARC, Islamabad- Pakistan)

Hassnain Shah (Principal Scientific Officer, Social Sciences Research Institute, NARC, Islamabad-Pakistan)

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Abstract

Agriculture took place on land, where crops, rising and rearing animals for the production of food for man and industries. But to run all the activities credit is the main stream. In most of the developing countries credit played a very important role in economic growth. This study is designed to analyze the impact of agriculture credit on growth. This type of work was done in 2003 by Iqbal et al. and the same methodology is followed in this paper. Secondary data was taken from 1970-2010. Water availability; labour availability and crop intensity are the important determinants of agriculture GDP.

Author(s)

Nadeem Akmal

Senior Scientific Officer, Social Sciences Research Institute, NARC, Islamabad- Pakistan

Bushra Rehman

Assistant Scientific Officer, Social Sciences Research Institute, NARC, Islamabad- Pakistan

Akhtar Ali

Senior Scientific Officer, Social Sciences Research Institute, NARC, Islamabad- Pakistan

Hassnain Shah

Principal Scientific Officer, Social Sciences Research Institute, NARC, Islamabad- Pakistan

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Introduction

Credit is the essential items for any activity of life and more over for the agriculture activates because it is directly related to our eating habits and purchasing power parity. In economic term credit is the mean stream to run the lively hood of the people of a country. In Agriculture sector credit is the back bone to run any business activity. Agricultural credit is an essential part of the progression of modernization of agriculture and commercialization of the rural economy. The availability of easy and cheap credit is the quickest way for boosting agricultural production. Therefore, it was the prime policy of all the successive governments to meet the credit requirements of the farming community of Pakistan (Vogt, 1978). In Pakistan the concept of credit and agriculture credit is not new it was there before the Independence of Pakistan but those credit

systems was non- institutional and large no of farmers were heavily dependent on them. In 1958 Under Agriculturists Loan Act (ALA), credit was provided for the purchase of inputs like seed, fertilizers, cattle and implements to relief poor farmers (Yusuf, 1984). A lot of work has been done on credit like effect of higher input expenditures is presumably associated with higher productivity growth (Saeed et al., 1996). The impact of institutional credit on agricultural production in Pakistan has been found to be positive and significant (Iqbal et al., 2003). Considerable efforts have been made to improve the quality of credit disbursement in different eras. In the early seventies, all private commercial banks were nationalized and all these banks were mandated to provide agriculture loan (Akram et al., 2008). This paper is the extension of Iqbal et al., work 2003. This paper will also explains the impact of institutional credit from 1970-2010.

Material and Methods

Credit is the main stream in agriculture production. Different credit indicator was analyzing to see the impact on agriculture gross domestic product. To analyze this Agricultural Gross Domestic Product (AGDP) was used which act like dependent variable and other variable like agricultural water availability, agricultural labour force, cropped area, and agricultural credit act as independent variables. Other variable like tractors, fertilizer, biocides, and improved seeds etc. which may impact the credit were not used in the model. The secondary data collected from Agriculture Statistics and Economic Survey of Pakistan various issues. Researcher included credit as an explanatory variable in the production function based on the argument of Carter (1989).

In order to avoid the problem of multicollinearity, the dependent and all the explanatory variables were transformed to per cultivated hectare. The Cobb-Douglas type production function given by following equation was estimated followed by Iqbal et al., 2003.

$$LGDPDCULT = \beta_0 + \beta_1 LCRPCULT + \beta_2 LLBPCULT + \beta_3 LWAPCULT + \beta_4 CROPINTE + \beta_5 DUMMY + U$$

Where

LGDPDCULT = Natural logarithm of agricultural gross domestic product per cultivated hectare.

LCRPCULT = Natural logarithm of institutional credit per cultivated hectare.

LLBPCULT = Natural logarithm of agricultural labour force per cultivated hectare.

LWAPCULT = Natural logarithm of farm gate availability of water per cultivated hectare.

CROPINTE = Cropping intensity (ratio of total cropped area to cultivated area).

DUMMY = Dummy variable for bad years (dummy=1 for years 1974-75, 1983-84, 1992-93, and 2000-2001; Else=0).

U = Random error term independently and identically distributed with zero mean and constant variance.

Results and Discussion

The disbursement of institutional credit (nominal) ranged from 128 million rupees in 1971-72 to about 248120.47 million rupees in 2009-10. The growth of nominal credit remained highest during the period 1971-72 to 1975-76 when it grew at the compound growth rate of 79.97 percent due mainly to banking reforms of 1972 and the smaller credit base (Iqbal et al., 2003). The growth of nominal credit slowed down between mid 1970s to mid 1980s but still was above 20 percent per annum. The growth of nominal credit was relatively low during the late 1980s to early 1990s. With the passage of time it grew at a higher rate and now again showed decreasing trend. In real terms also the institutional credit showed a similar pattern but with a much smaller growth rate. The growth of real credit after mid 1980s to mid 1990s and 2005-10 showed a negative trend (Table 1).

The ratio of institutional credit as percentage to agricultural GDP for the period 1971-72 to 2009-2010 is shown in Figure 1. In 1971-72 the institutional credit grew higher from 0.71 percent to a 11.56 percent during 1986-87 as the percentage of agricultural GDP. Afterwards, the credit as a percentage GDP continuously declined to 6.42 percent during 1990-91 and fluctuated below 6 percent during the period 1991-92 to 2000-01 with a lowest of 3.29 percent occurring in 1996-97. Institutional credit data reflects that a very small proportion of agriculture GDP in the mid of 1980 to mid of mid 1990. In 2001-2010 time period the institution credit again contributing in Agriculture GDP. During the period 2007-08 it reaches to 10.49 percent.

The availability of nominal and real institutional credit on per cropped hectare basis increased continuously till after the mid 1980s and stood at rupees 800.49 and 2305.10 per cropped hectare respectively in 1987-88 and 1986-87. In 1988-89 the nominal credit per cropped hectare showed the decreasing trends and fluctuated around 650 rupees per cropped hectare between the years 1988-89 to 1991-92. After that it showed increases trend except few years. After 1986-87, the availability of real credit per cropped hectare showed decreasing

trend up to 1995-96 after which it recovered slowly now it reaches above the level of mid 1980's as shown in Figure 2. This declined availability of institutional credit in real terms after mid 1980s and increasing per hectare costs of production due to increasing prices of inputs, withdrawal of input subsidies, and levy of sales tax on inputs like fertilizer and pesticides may have adverse implications for agricultural growth (Iqbal et al., 2003).

Regression Analysis

The Cobb-Douglas type production function was estimated using the ordinary least squares (OLS) method. All the variables transformed by taking the natural log to overcome the problem of multicollinearity among the independent variables. The final estimates of the equation are presented in the following Table 2.

The first variable of table 2 LCRPCULT showing positive and significant relationship with agriculture gross domestic product. Theoretical the credit disbursement plays significant impact on the farmer's livelihood. The variable agriculture labour forces per cultivated shows a positive and significant relationship with agriculture gross domestic product. According to the literature in most developing countries, agriculture provides employment for over seventy percent (70%) of the entire population (Longe, 2008). The coefficient shows that 10% increase in agriculture labour forces per cultivated will bring 1.18 percent increase in agriculture gross domestic product per cultivated hectares. LWAPCULT shows a significant and positive impact on AGDP. Theoretically irrigation water supply improves with the passage of time. Coefficient shows that 1 percent increase in LWAPCULT will bring 3.29 percent change in LGPDCULT. Crop intensity and dummy variable shows a positive but insignificant relationship with agriculture gross domestic product. The R^2 shows that 0.96 percent variation in LGDPCULT is explained by the independent variables. Adjusted R^2 value is 0.957. F- test is applied on the model to test the overall significance of the model. This shows that overall model is good fit and significant at 1.0 percent level.

The second equation was estimated by taking the $ma(1)$ which is a moving average error specification which was used to adjust the residuals. The results were shown in the Table 3.

The R^2 shows that 0.98 percent variation in LGDPCULT is explained by the independent variables. Adjusted R^2 value is 0.98. F- test is applied on the model to test the overall significance of the model. This shows that overall model is good fit and significant at 1.0 percent level.

The coefficient for agricultural credit is positive and significant at 1 percent level and suggests that institutional credit affect agricultural production positively. A 1 percent increase in the disbursement of institutional credit would induce an increase of about 0.54 percent in agricultural GDP. Similarly, labour also has a positive and statistically significant impact on agricultural production. The coefficient for the cropping intensity variable is also positive and significant at 5 percent. It shows that increase in cropping intensity increases agricultural GDP.

Conclusions

During last decades the credit expands a lot and has a positive impact on the growth. In the decade of 1980's to mid 1990's the nominal credit increases at a slower rate. But the real credit didn't show such fluctuation. Availability of irrigation water and agricultural labor per cultivated hectare, and cropping intensity are the other important determinants of agricultural GDP.

There are a lot of changes in Agriculture credit disbursement schemes there is need to provide loans to the small farmers at easy pay backs terms and conditions. There is also need to introduce the agriculture insurance schemes in which farmers loss risk can be reduced in case of drought, pest attacks, hailstorm, thunderstorm, heavy rains, and other natural hazards. Credit distributions should be in such manner that it covers all the aspects of agriculture activities like major crops, minor crops, horticultural and livestock's. There is also need to do more work on the impact of

credit of food grain items, exportable primary items like cotton etc.

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Table 1: Growth of Nominal and Real Institutional Agricultural Credit in Pakistan

Period	Compound Growth Rate (Percent)	
	Nominal Credit	Real Credit
1971-72 to 1975-76	79.97	48.49
1975-76 to 1980-81	21.93	12.04
1980-81 to 1985-86	19.07	17.71
1985-86 to 1990-91	0.40	-10.55
1990-91 to 1995-96	6.24	-4.52
1995-96 to 2000-01	23.98	16.90
2001-02 to 2005-06	25.90	17.23
2005-06 to 2009-10	13.51	-2.13

Table 2: The OLS Estimates of Cobb-Douglas Production Function

Variables	Coefficient Estimates	t-Values	Significance
Constant	2.422*	1.857	0.072
LCRPCULT	0.429***	5.272	0.000
LLBPCULT	1.182*	1.701	0.098
LWAPCULT	3.299***	3.979	0.000
CROPINTE	0.462	0.428	0.671
DUMMY	0.055	0.360	0.720
R ² =0.963		Adjusted R ² =0.957	
F= 173.935		Durbin Watson=0.834	

***=Significant 1%

**= Significant 5%

*= Significant 10%

Table 3: The OLS Estimates of Cobb-Douglas Production Function

Variables	Coefficient Estimates	t-Values	Significance
Constant	4.648***	6.641	0.000
LCRPCULT	0.548***	6.455	0.000
LLBPCULT	1.507***	2.787	0.008
LWAPCULT	0.664	1.113	0.273
CROPINTE	0.847**	1.983	0.055
DUMMY	0.004	0.080	0.936
MA(1)	0.999***	195600.8	0.000
R ² =0.983		Adjusted R ² =0.980	
F= 311.84		Durbin Watson=1.137	

***=Significant 1%

**= Significant 5%

*= Significant 10%

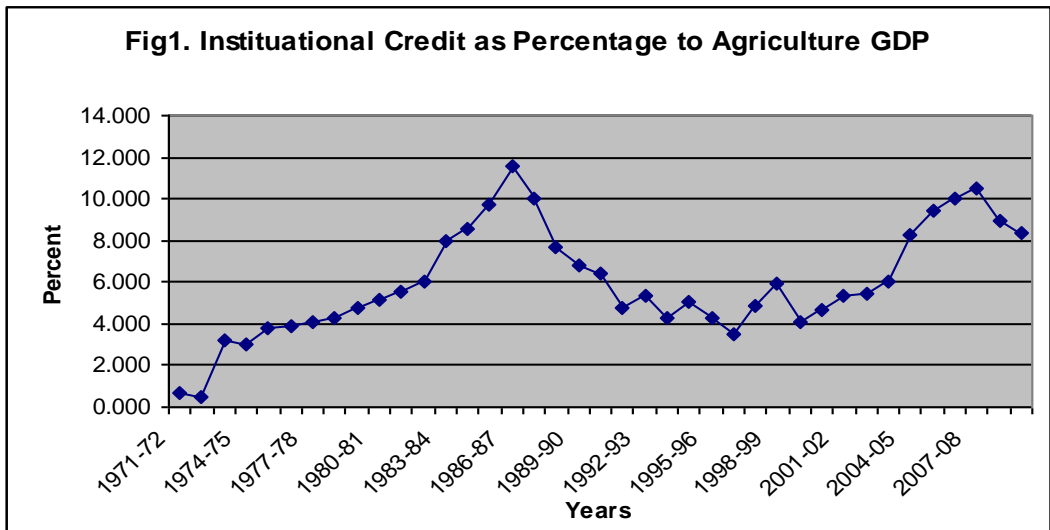


Fig. 2: Institutional Credit as Percentage to Agriculture GDP

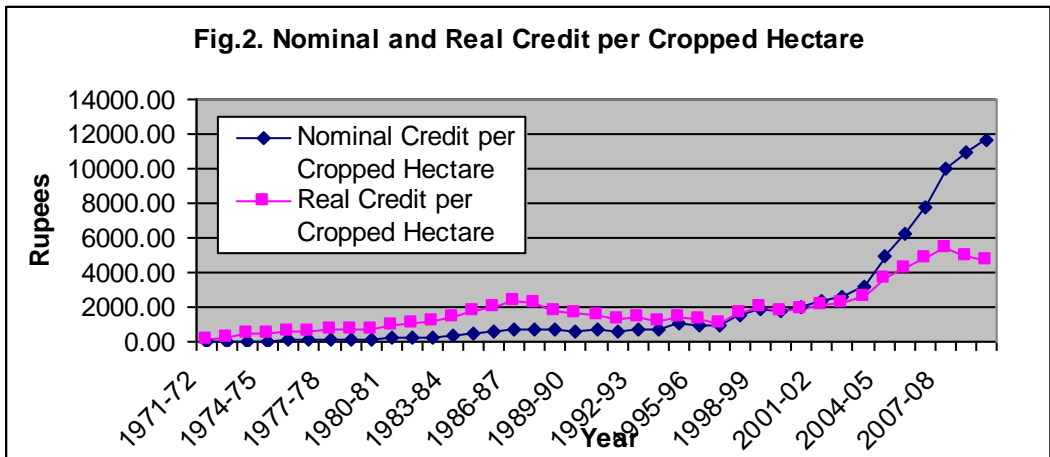


Fig. 2: Nominal and Real Credit per Cropped Hectare