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## Article

# Famers' access to credit: Does collateral matter or cash flow matter? Evidence from Sindh, Pakistan

Cogent Economics & Finance

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*Suggested Citation:* Chandio, Abbas Ali; Jiang, Yuansheng; Wei, Feng; Rehman, Abdul; Liu, Dan (2017) : Famers' access to credit: Does collateral matter or cash flow matter? Evidence from Sindh, Pakistan, Cogent Economics & Finance, ISSN 2332-2039, Taylor & Francis, Abingdon, Vol. 5, Iss. 1, pp. 1-13,  
<https://doi.org/10.1080/23322039.2017.1369383>

This Version is available at:

<https://hdl.handle.net/10419/194717>

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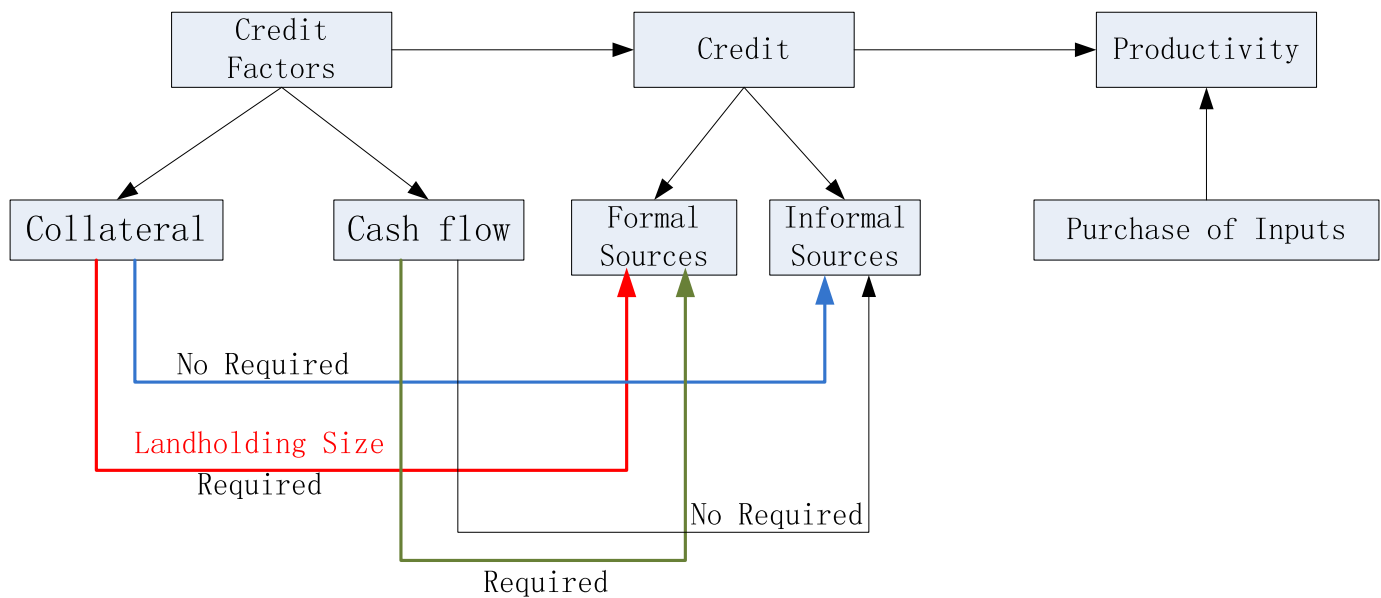
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**GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE**

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*Cogent Economics & Finance* (2017), 5: 1369383



Received: 16 May 2017  
Accepted: 15 August 2017  
First Published: 24 August 2017

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Reviewing editor:  
Goodness Aye, University of Agriculture,  
Nigeria

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## GENERAL & APPLIED ECONOMICS | RESEARCH ARTICLE

# Famers' access to credit: Does collateral matter or cash flow matter?—Evidence from Sindh, Pakistan

Abbas Ali Chandio<sup>1</sup>, Yuansheng Jiang<sup>1\*</sup>, Feng Wei<sup>1</sup>, Abdul Rehman<sup>2</sup> and Dan Liu<sup>1</sup>

**Abstract:** Credit is highly demanded in different parts of the world, mainly for capital requirement to improve land, purchase of main agricultural inputs including fertilizers, seeds, pesticides, and purchase of farm machinery. The purpose of this study was to examine the farmers' access to credit: does collateral matter or cash flow matter?—evidence from Sindh province of Pakistan. The random sampling technique was used to collected data from 300 rural households through a face-to-face interview. To find the important factors affecting access to credit in Sindh province of Pakistan, we performed descriptive statistics and probit regression model. The results of probit regression model showed that gender, household size, educational level, farming experience, farm size, income, and availability of collateral have positive effect on farmers' access to credit, while age has a negative and statistically insignificant effect on the farmers' access to credit. Therefore, this study recommended that institutional sources of credit (such as the ZTBL and other Commercial Banks) should improve their loaning schemes to better suit the diversified needs of small farmers.

**Subjects:** Rural Development; Economics and Development; Finance

**Keywords:** financial sources; credit access; probit model; Pakistan

### 1. Introduction

It's very critical for smallholders to access credit in developing countries of the world. This is all due to total production of farmers and improvement in agricultural production per unit input. Credit is a



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Abbas Ali Chandio is the PhD research scholar in college of Economics, Sichuan Agricultural University, Chengdu, China. He won Sichuan Government Scholarship (SGS) 2014 sponsored by SAU. His major interests include Rural Finance, Agricultural Economics, Agricultural Development, Development Economics, Econometrics, Financial Economics, Microeconomics, Macroeconomics, Regional Economics, Sustainable Agriculture and Regional Rural Development. Due to his excellent research work, he has been awarded with Excellent International Students Award in 2017. He has good research publications in the world leading journals databases that having indexing of the Web of Science.

### PUBLIC INTEREST STATEMENT

The main objective of this study is to examine the determinants of farmers' access to credit, and the effects of access to credit on household behavior and welfare in Sindh province of Pakistan. The random sampling technique was used to collected data from 300 farmers through a face-to-face interview. The collected data were analyzed through the probit regression model. The results of our study showed that gender, household size, education, farming experience, farm size, income, and collateral have positive effect on farmers' access to credit, while age has a negative and statistically insignificant effect on the farmers' access to credit. This is the first study to examine the determinants of farmers' access to credit, and the effects of access to credit on household behavior and welfare in Sindh province of Pakistan. This paper will be an important addition to the literature regarding access to credit studies.

very important factor in different aspect of farming maneuver. Credit is highly demanded in different parts of the world, mainly for capital requirement to improve land, purchase machinery, seeds, breeding stocks, and fertilizers as well as labor payment of wages. Agricultural credit can be defined into institutional and non-institutional sources; including cooperative societies, commercial, and development banks. Sources of non-institutional credit cannot contribute for agricultural development (Olomola, 1999).

Blancard, Boussemart, Briec, and Kerstens (2006) studied the conceptual frame work of credit availability can determine through different factors, that farm has various techniques to access financial resources. Through vertical integration agriculture sector is channeled to financial resources. The recent work on vertical integration and contracting shows an important source of credit to farms in the CEE (Dries & Swinnen, 2004; Gorton & White, 2007). Government in several countries intercede in agricultural markets with development support polices. Even though support of agricultural credit may not be directly intended to improve the access of credit. Furthermore, government interventions and rural financial structures may lead to input specific changes. For instance, subsidy of agriculture increases short-run credit which is needed to finance variable rather than long-run credit (Ciaian & Swinnen, 2009). In the occurrence of expensive contract implementation and unequal information, the collateral may occur an important way to farms to access credit (Bester, 1985; Ghosh, Mookherjee, & Ray, 2000).

Diagne and Zeller (2001) research shows that the difference between credit market and access to credit. They examined that households of farm have access to credit but do not take part in credit market due to risk on return of loan. Their study also revealed that formal and informal loans in the agriculture. The result indicates that formal lenders provide a greater percentage of loans to the farmers as compare to informal lenders.

In rural areas of Pakistan, smallholders obtain credit from formal and informal sources. Formal sources like ZTBL, Commercial Banks, Microcredit Institutions, and NGOs, while informal sources include relatives, friends, commission agents, input suppliers, and shopkeepers (Khandker & Faruque, 2003). Among financial sources, formal credit sources are more common in rural areas of Pakistan. However, informal credit sources plays an important role in smallholders' access to credit, particularly among those who do not have access to credit from formal credit sources. Furthermore, most of smallholders are borrowing credit from relatives, input suppliers, and fellow farmers. Large farmers have more access to credit from institutional sources compared to smallholders. The main reason for this is their possession of more collateral, high income level and social status (Chandio, Magsi, Rehman, & Sahito, 2017; Hussain & Thapa, 2012). Amjad and Hasnu (2007) reported that smallholders are more dependent on non-institutional sources of credit compared to institutional sources, as 90% of smallholders acquired credit from non-institutional sources. However, non-institutional sources of credit cannot fulfill farmers' demand for credit due to associated problems like as need for collateral and production guarantees (Basu, 1997). In Pakistan, the government has implemented a policy to provide agricultural credit to the smallholders for increasing agriculture productivity and food security. The policy was partially successful in increasing the proportion of rural household access to agricultural credit but it was less successful in fulfilling smallholders demand for agricultural credit (Hussain & Thapa, 2012). This resulted in a huge gap between the smallholders demand and the supply of agricultural credit. In rural areas, smallholders are facing various problems such as complicated and lengthy procedure of documentations, high interest rate, short-term nature of the credit, and the alarming problem is mortgage for security which is demanded by banks (Abdullah, Khan, Jebran, & Ali, 2015; Hussain & Thapa, 2012; Tagar & Panhwar, 2010). Thus, previous studies on institutional credit show that smallholders have limited access to institutional credit primarily due to institutional constraints (Aleem, 1990; Jabbar, Ehui, & Von Kaufmann, 2002; World Bank, 2008). However, large farmers have better access to institutional credit as they are able to influence financial sources by virtue of their position of high-value collateral such as their high landholding size (Ladman & Tinnermeir, 1981). Furthermore, many researchers have studied in different regions of Punjab and KPK provinces of Pakistan like as (Abedullah, Mahmood, Khalid, & Kouser, 2009; Ahmad, Jan, Ullah, &

Pervez, 2015; Bashir & Mehmood, 2010; Chandio, Jiang, Joyo, & Rehman, 2016; Hussain & Thapa, 2012; Iqbal, Munir, & Abbas, 2003; Jan & Khan, 2012; Nouman, Siddiqi, Asim, & Hussain, 2013; Saqib, Ahmad, Panezai, & Khattak, 2016) on access to institutional credit and impact of institutional credit on field crops production like as wheat, rice, sugarcane, and on livestock. But, this study differs from the previous researches. This study attempts to investigate farmers' access to credit: does collateral matter or cash flow matter?—evidence from Sindh province of Pakistan as a case study using probit regression model.

## 2. Farmers endowment and the mortgaged property

Land is the most valuable asset of rural families in Sindh province of Pakistan. The survival of farmers is largely dependent on land, and land ownership is very limited. However, land is the most important form of easy access to collateral for loans and farmers are not likely to evasion easily. As large farmers has higher landholdings and also have better access to formal credit. Furthermore, larger farmers in rural societies have more social status and have a good relationship.

In Pakistan, majority of the households in rural areas are smallholders. The institutional credit sources provides agricultural credit to the rural households with the primarily condition to repay the amount along with the interest rate on the total amount borrowed. The borrower is required to repay as he provide personal guarantors or guarantee in the form of landholding size collateral to the institutional credit sources. The ZTBL and Commercial Banks relies on personal commitments as shown by Bashir and Azeem (2008), Hussain and Thapa (2012) who found that most of smallholders provide personal collateral or personal guarantees to the banks in order to agricultural credit access. However, there are three types of farmers living in the rural areas of Sindh province of Pakistan with land size of 12.5 acres like self-sufficient farmers, economic holding farmers have 12.6–50 acres and above economic holding farmers have 50 acres, respectively (SBP, 2003). Collateral is the formal sources of security which is required for the loan and it is rarely required by informal sources of credit. Inadequate or lack of collateral and size, smallholders' uneasy access to formal credit due to small landholdings and low social status. As a result, most of the smallholders borrowed credit from informal sources due to following reasons.

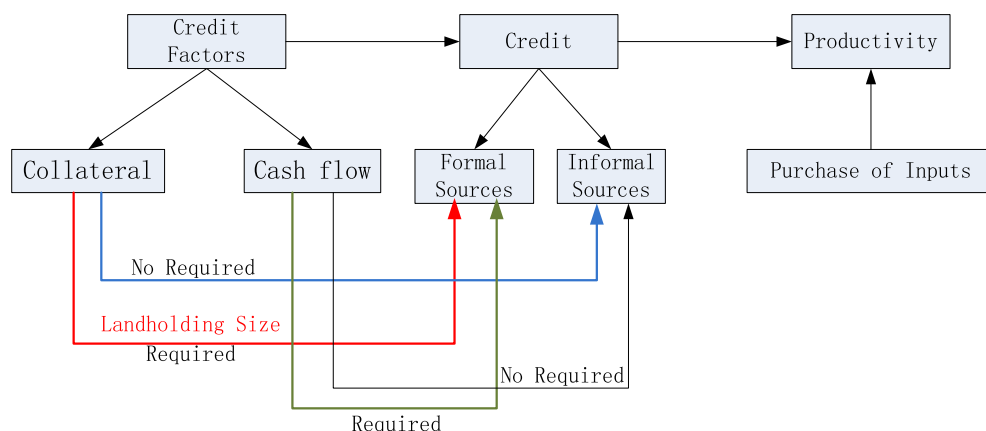
- No requirement of Agricultural Pass Book.
- No requirement of other guarantees.
- No any lengthy documentation procedure for borrowing credit.
- Timely availability and easy accessibility of credit.

Therefore, in rural areas of Sindh province of Pakistan non-institutional sources of credit have significant role in obtaining credit for smallholders.

## 3. Effects of collateral and income on access to credit

Collateral is required for all borrowers by institutional sources of credit and default is that; it can be used to offset the loan if the borrower fails to pay the principal amount of loan and interest satisfactorily under the terms of the loan agreement. The availability of collateral is a very important factor that affects the formal credit of the farmers. It has a positive and significant impact on access to formal credit. There are several types of collaterals are required by institutional sources for agricultural credit, such as land, gold, income, wage accounts, and livestock. These types of collaterals are required by the banks to ensure repayment of agricultural credits in rural areas of Sindh province of Pakistan as given in (Figure 1). Safe and secure land is the preferred form of collateral for ZTBL and also other commercial banks in Sindh, Pakistan. If smallholders have landownership certificate (Agricultural Pass Book), they can use landownership certificate for collateral and they can easily access to formal credit. On the other hand, high farm income and off-farm income are important factors that affect the formal credit of the farmers. Recent empirical findings also shows that income has positively influenced access to formal credit (Denkyirah, Adu, Aziz, Denkyirah, & Okoffo, 2016;

**Figure 1. Theoretical analysis framework.**



Duniya & Adinah, 2015). Farmers with high farm income have more probability of access to formal and informal credits and have better abilities of repaying loans given to them by financial sources.

#### 4. Materials and methods

##### 4.1. Study area

The present study is conducted in Sindh province of Pakistan. Sindh is the second largest province of Pakistan on the basis of its contribution to agriculture production of the country. This province has geographical area of 140,900 square kilometers. It is estimated that 62% of geographical area of Sindh province is arid, comprising Thar, Nara, and Kohistan, beside a large area under coastal belt (350 km) and Katcha area. Furthermore, total reported area of Sindh province is 14.09 million hectares. Cultivated area is 5.08 million hectares and uncultivated area is about 6.80 million hectares as given in Table 1 (Government of Pakistan [GOP], 2011).

Sindh province is one of the major agricultural provinces in Pakistan, almost 14 million people are living in rural areas and engaged in agricultural farming, forestry, animal husbandry, and fish farming activities. The climate condition of Sindh is tropical and sub-tropical, during the tropical the month of May–August the temperature may reach up to more than 45°C, while in the cold the month of December and January decreases to 2°C. The mostly rainfall occur in the month of July and August. According to soil and climatic condition, this province consists of three crop zones like as upper, middle, and lower parts of Sindh. The upper part of Sindh is the best for different growing crops like as rice as main crop, sugarcane, matter, rape, mustard, and sunflower. Whereas, the middle part of Sindh is suitable for growing different crops such as cotton, wheat, banana, and sugarcane. While lower part of Sindh is suitable for different cultivated crops as cotton, wheat, tomato, sunflower, soybean, and groundnut.

**Table 1. The land utilization statistics in Sindh province of Pakistan**

Land utilization	Million hectare	Percentage
Total reported area	14.09	100
Uncultivated area	6.80	48.26
Culturable waste	1.18	8.37
Cultivated area	5.08	36.05
Forest area	1.03	7.31

Source: Agriculture Statistics of Pakistan 2010–2011.

#### 4.2. Sampling and data collection

For the present study, primary data have been collected through a survey and administering set of interview schedule to farmers in rural areas of Sindh province. A multi-stage random sampling technique has been applied to collect the data. At first stage, five districts, i.e. Shikarpur and Sukkur from upper region, Naushahro Feroze and Shaheed Benazir Abad, previously known as Nawabshah from middle region, and Badin from lower region have been selected from Sindh province of Pakistan as shown in (Figure 2). At second stage, six villages from each district have been randomly selected and from each village 10 farmers have been personally interviewed. Thus, the total number of respondents came out to be 300. At finally stage primary data have been collected through a well-designed detailed questionnaire in order to collect socioeconomic characteristics information of the farmers (age, gender, education, farming experience, landholding size, household size, off-farm income, and availability of collateral). The collected primary data have been analyzed with the help of Stata software.

#### 4.3. Analytical techniques

Accessibility can be defined by the utility maximization theory. It is expected that a rural household will desire to access credit if the utility derived from credit accessibility levels highest compared to the utility derived from not accessing the credit. In this study, accessibility of credit is assumed to be binary choice such that a rural household is expected to either borrow credit or not. A farmer is therefore expected to have access to credit for the highest marginal benefits. Let the state of accessibility be represented by  $Pr$ , where  $Pr = 0$  for no access and  $Pr = 1$  for access. If it is assumed that the error term follows a normal distribution, then the estimation can be achieved using a probit

Figure 2. Map of study area.



distribution model as described by Gujarati (2009). Specifically, the model takes the implicit form as follows:

$$y = f\left(\sum_{i=1}^n \beta_i X_i\right) \quad (1)$$

where  $y$  is the probability of access/no-access credit and  $X_i$  refers to all explanatory variables.

$$P_r(y = 1|X_i) = \Phi\left(\beta_0 + \sum_{i=1}^8 \beta_i X_i + \varepsilon_i\right) \quad (2)$$

If we assume  $\Phi$  is following the standard normal CDF, Equation (1) becomes explicitly written as a probit model:

$$P_r(\text{CRA} = 1|X) = \Phi(\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \varepsilon_i) \quad (3)$$

where CRA (Credit access) is a dichotomous dependent variable which refers to 1 for access to credit and 0 otherwise. That is

$$\text{CRA} = 1(\text{CRA} > 0) = \begin{cases} 1 & \text{if } \text{CRA} > 0 \\ 0 & \text{otherwise} \end{cases}$$

$X_1$  = Age of the farmers (years)

$X_2$  = Gender (dummy 1 = male, 0 = female)

$X_3$  = Educational level (years)

$X_4$  = Household size (numbers)

$X_5$  = Farming experience (years)

$X_6$  = Farm size (acres)

$X_7$  = Off – farm income (PKR)

$X_8$  = collateral availability (dummy 1 if available, 0 otherwise)

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$  = Parameters to be estimated.

$\varepsilon_i$  = Stochastic error term

## 5. Results and discussion

The aim of this research is to investigate farmers' access to credit: Does collateral matter or cash flow matter?—evidence from Sindh province of Pakistan as a case study. Quantitative data were collected during the period from November 2016 to December 2016 from 300 farmers. The information collected include socioeconomic characteristics of the farmers. Descriptive statistics and probit regression were used to examine the determinants of farmers' access to credit, and the effects of access to credit on household behavior and welfare in Sindh province of Pakistan.

### 5.1. Characteristics of the farmers

Table 2 represents the several socioeconomic characteristics of the farmers like gender is captured as a dummy (i.e. 1 if male, 0 if female), age (in years), education level (in years), farming experience (in years), farm size (in acre), household size (in numbers), collateral security captured as a dummy (i.e. 1 if available, 0 otherwise), and off-farm income is measured (in PKR) are summarized in Table 2.



**Table 2. Mean socioeconomic characteristics of the respondents**

Variables	Mean	SD
Age of rural household head (in years)	41.16	11.47
Gender (dummy)	0.793	0.406
Education (in years)	7.450	4.425
Household size (in number)	8.853	2.720
Farming experience (in years)	26.58	9.539
Farm size (acres)	12.81	14.40
Off-farm income (in PKR)	23,283.33	12,108.20
Availability of collateral (dummy)	0.677	0.469

Source: Researchers' own calculations, Field Survey (2016).

It could be viewed from the Table 2 that a mean gender of the respondents was 0.793 with standard deviation of 0.406 of the population are males. Similarly, the mean value of age is 41.16 years with standard deviation of 11.47, which means majority of the farmers in the study area are young and strong with adequate energy to tackle the challenges of farming activities. Whereas, the statistics indicate of education level of the respondents' a mean value of 7.450 with a standard deviation of 4.425, this means that high level of formal education achievement may increase to well assessment and management of funds, better farming decision, and efficient allocation of major agricultural inputs cost. Furthermore, finding on socioeconomic factors shows that the mean value of farming experience is 26.58 with a standard deviation of 9.539, this means farmers with more years of farming experience have better knowledge to adopt new farm technology to enhance the efficiency of their crops production. The mean household size in the study area is investigated about 8.853 with a standard deviation of 2.720, which implies that an increase in the size of the family incentivizes the household to increase its agricultural productivity. Similarly, the average farm size is investigated about 12.81acres with a standard deviation of 14.40, this means farm size is an important factor in accessing formal and informal credit and it is a symbol of high social status in the rural society. The income level of off-farm is with a mean value of Rs. 23,283.33 with a standard deviation of 4.425 which is low indicates that the rural households were likely to borrow credit form institutional sources or non-institutional sources to carry most of the farming activities. In addition, a mean value of collateral security variable is 0.677 with a standard deviation of 0.469, which means more collateral security available farmers would access to credit.

### 5.2. Correlation matrix

To examine the association among the variables, correlation matrix was used. The correlation matrix results of the constructed variables are presented in Table 3. Results show that access to credit has a positive and significant relationship with household size, farming experience, income level, and availability of collateral. Further, a positive association was found on age, gender, education, and landholding size but insignificant.

### 5.3. Determinants of farmer's access to credit in Sindh province of Pakistan

The estimated results of probit regression model are presented in Table 4. The likelihood ratio test with the chi-square statistic indicates significant value of -74.796 and chi-square value of 50.37 implying that the estimated model is significant. Hence, the probit regression model is considered to be a good fit and equally consistent with theory. Also the value of fit measure, pseudo-R<sup>2</sup> (0.3079) showed a very satisfactory fit. It is clear that the explanatory power of the probit model is satisfactory and the model can be applied to describe the probability of accessing to credit by farmers in rural areas of Sindh, Pakistan. Based on the estimated results, seven explanatory variables are found to have a positive effect on farmers' access to formal credit including gender (+), education (+), household size (+), farming experience (+), farm size (+), off-income (+), and (+) availability of collateral.

**Table 3. Estimated correlation matrix results**

Variables	Credit access	Age	Gender	Education	Household size	Farming experience	Farm size	Off-income	Availability of collateral
Credit access	1.00								
Age	0.03	1.00							
Gender	0.10	0.10	1.00						
Education	0.04	-0.07	-0.09	1.00					
Household size	0.13*	0.35**	-0.01	-0.03	1.00				
Farming experience	0.12*	0.60**	-0.04	-0.05	0.23**	1.00			
Farm size	0.03	0.21**	0.06	0.04	0.08	0.07	1.00		
Off-income	0.16**	-0.06	-0.05	0.02	-0.01	0.06	-0.06	1.00	
Availability of collateral	0.42**	-0.01	0.07	0.01	0.04	0.01	-0.05	0.036	1.00

\*Correlation is significant at the 0.05 level (2-tailed).

\*\*Correlation is significant at the 0.01 level (2-tailed).

**Table 4. Results of probit regression analysis**

Variables	Coefficient	Robust SE	z	P >  z
Age	-0.0163912	0.0141206	-1.16	0.246
Gender	0.2519995	0.2381868	1.06	0.290
Education	0.2365701	0.2836081	0.83	0.404
Household size	0.0843538**	0.0443412	1.90	0.057
Farming experience	0.6894329**	0.3526541	1.95	0.051
Farm size	0.168599	0.1687914	1.00	0.318
Income level	0.7005428**	0.3198813	2.19	0.029
Availability of collateral	1.560256***	0.2496934	6.25	0.000
Constant	-7.240896**	3.234158	-2.24	0.025
LR $\chi^2 = 50.37$ Prob > $\chi^2$ 0.000				
Pseudo R <sup>2</sup> = 0.3079				
Log Likelihood = -74.796532				

Source: Researchers' own calculations, Field Survey (2016).

\* $p < 0.10$  of significance level.

\*\* $p < 0.05$  of significance level.

\*\*\* $p < 0.01$  of significance level.

The coefficient of age is negative, this means when the age increases, access to credit decreases. The results of our study are consistent with the results of other studies (Anders, 2002; Kaino, 2005; Sebopetji & Belete, 2009; Winter-Nelson & Temu, 2005). They reported that the age has a negative effect on access to formal credit. Furthermore, the coefficient of education level is positive but statistically insignificant. This implies that farmers who have attained secondary education or less have more probability to access to credit from institutional sources than the uneducated households. The result of our study is consistent with the findings of Akram, Hussain, Sial, and Hussain (2008), Amjad and Hasnu (2007), Duniya and Adinah (2015), Li, Gan, and Hu (2011), Ibrahim and Aliero (2012), Ugwumba and Omojola (2013) who reported a positive association between access to credit and education level. Whereas, a significant and positive association is found between variable household size and households' access to credit, indicating that larger households have higher demand for credit to increase agricultural productivity. This finding is similar with the findings of Vaessen (2000) and Ho's (2004). They found that access to formal credit increases with household size. The significant positive sign on farming experience continuous variable indicates that a direct relationship exists between the farming experience and the credit demanded by the farmers. This implies that a unit increase in experience of farmers can increase the probability to have access to formal credit. This is similar to the results obtained by Okunade (2007), Nouman et al. (2013), Duniya and Adinah (2015), Saqib et al. (2016) that farming experience is a significant factor influencing farm management and decision-making. Similarly, we further found that landholding size has right positive relation with access to credit but variable is statistically insignificant. Hence, landholding size is an important factor in accessing credit from formal sources and it is a symbol of higher social status in the society of rural households which is also helps in getting credits from informal sources. In rural areas of Sindh province of Pakistan, most of smallholders had limited landholding size and those smallholders had limited access to institutional credits. The finding of this study for landholding size is consistent with findings of Akram et al. (2008), Hussain and Thapa (2012), Saqib et al. (2016) who reported that small upper holders having farm size from 2.5 acres to 5.00 acres had above average access to credit from institutional sources, while the small landholder farmers had lower access to credit from institutional sources. Additionally, we further found that the estimated coefficient of income has a positive and significant influence on access to credit. The result implies that farmers with high income level have high probability of accessing credit from institutional sources. Furthermore, high income-level farmers may also be more confident in repaying credits if they acquiring from formal sources. Our finding regarding income level is in agreement with Duniya and Adinah (2015), Ibrahim and Aliero (2012), Li

**Table 5. Socioeconomic factors affecting on access to credit (marginal effects analysis)**

Variables	dy/dx	Std. Err.	z	P >  z
Age	-0.0017323	0.00147	-1.18	0.238
Gender	0.0300731	0.02937	1.02	0.306
Education	0.0284702	0.038	0.75	0.454
Household size	0.0089149*	0.00501	1.78	0.075
Farming experience	0.0559083**	0.02598	2.15	0.031
Farm size	0.0178184	0.01807	0.99	0.324
Income level	0.0740369***	0.0258	2.87	0.004
Availability of collateral	0.2665232***	0.04612	5.78	0.000

Source: Researchers' own calculations, Field Survey (2016).

\* $p < 0.10$  of significance level.

\*\* $p < 0.05$  of significance level.

\*\*\* $p < 0.01$  of significance level.

et al. (2011), Saqib et al. (2016). They have found significant and positive relationships between access to credit and income. Finally, the availability of collateral is an essential factor that affects the farmer's access to formal credit. Safe and secure land is the preferred form of collateral for ZTBL and also commercial banks in Pakistan. This study found that the estimated coefficient of collateral security has a positive and significant effect on access to credit. Hence, the positive effect of collateral implies that the more collateral farmer have higher probability of accessing credit from institutional sources. The result of our study is consistent with the findings of Atieno (2001), Hainz and Teksöz (2006), Sanusi and Adedeji (2010), Ibrahim and Aliero (2012), Duniya and Adinah (2015) they found a significant and positive relationship between access to credit and collateral.

#### 5.4. Socioeconomic factors affecting on access to credit (marginal effects)

The accessibility of credit was to be influenced by a number of socioeconomic factors of the respondents. Table 5 shows that an estimated marginal coefficient of household size, farming experience, income, and availability of collateral has a significant and positive influence on the accessibility of credit. These results imply that 1% increase in these variables the probability of access to credit will increase by 0.0089149, 0.0559083, 0.0740369, and 0.2665232%, respectively (Table 5).

### 6. Conclusions and policy recommendations

This study investigated the famers' access to credit: does collateral matter or cash flow matter?—evidence from Sindh, Pakistan. Overall, our results suggest that smallholder farmers in Sindh province have limited access to formal credit, including the agricultural credits provided by ZTBL and other commercial banks. This study is based on probit model has established eight household-level factors important in influencing farmers' likelihood to access credit, including age, gender, household size, educational level, farming experience, landholding size, collateral, and income. The estimated results of probit regression analysis showed that age negatively influenced farmers' access to credit, while gender, household size, education, farming experience, landholding size, collateral, and income positively influenced farmers' access to credit in the study area. In obtaining formal credit from formal sources in rural areas of Sindh province of Pakistan, still small farmers have low access to formal credit compared to large farmers due to lack of collateral, low income level, and their less landholding size. Thereby, only those farmers who have collateral, high income level, and large landholding size are capable of acquiring formal credit. Hence, to improve small farmers' access to credit, this study recommended that the institutional sources of credit need to restructure their policies and financial mechanism that requires securities in the form (like personal security, standing crops) that smallholder farmers could easily access to formal credit. Furthermore, the cumbersome procedure of getting agricultural pass book from the department of revenue, due to which most of the smallholder farmers lose interest in applying for credit from formal sources, needs to be simplified.

### Acknowledgments

The authors are very grateful to ZaraiTaraqiati Bank Limited (ZTBL) and Khushhali Bank officials for their support during field visit and providing the needed research materials. Also, authors would like to express their thanks to the editor and two anonymous reviewers for their insight comments and suggestions that substantially enhanced the quality of the paper.

### Funding

The authors received no direct funding for this research.

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### Citation information

Cite this article as: Famers' access to credit: Does collateral matter or cash flow matter?—Evidence from Sindh, Pakistan, Abbas Ali Chandio, Yuansheng Jiang, Feng Wei, Abdul Rehman & Dan Liu, *Cogent Economics & Finance* (2017), 5: 1369383.

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### References

- Abdullah, D. Z., Khan, S. A., Jebran, K., & Ali, A. (2015). Agricultural credit in Pakistan: Past trends and future prospects. *Journal of Applied Environmental and Biological Sciences*, 5, 178–188.
- Abedullah, Mahmood, N., Khalid, M., & Kouser, S. (2009). Role of agriculture credit in the growth of livestock sector: A case study of Faisalabad. *Pakistan Veterinary Journal*, 29, 81–84.
- Ahmad, A., Jan, I., Ullah, S., & Pervez, S. (2015). Impact of agricultural credit on wheat productivity in District Jhang, Pakistan. *Sarhad Journal of Agriculture*, 31, 65–69.
- Akram, W., Hussain, Z., Sial, M., & Hussain, I. (2008). Agricultural credit constraints and borrowing behavior of farmers in rural Punjab. *European Journal of Scientific Research*, 23, 294–304.
- Amjad, S., & Hasnu, S. (2007). Smallholders' access to rural credit: Evidence from Pakistan. *The Lahore Journal of Economics*, 12(2), 1–25.
- Aleem, I. (1990). Imperfect information, screening and the cost of informal lending: A study of a rural credit market in Pakistan. *The World Bank Economic Review*, 4, 329–349. <https://doi.org/10.1093/wber/4.3.329>
- Anders, I. (2002). *Access to formal finance in Kenyan manufacturing* (p. 3). Sin Working Paper Series.
- Atieno, R. (2001). *Formal and informal institutions' lending policies and access to credit by small-scale enterprises in Kenya: An empirical assessment* (Vol. 111). Nairobi: African Economic Research Consortium.
- Basu, S. (1997). Why institutional credit agencies are reluctant to lend to the rural poor: A theoretical analysis of the Indian rural credit market. *World Development*, 25, 267–280. [https://doi.org/10.1016/S0305-750X\(96\)00103-9](https://doi.org/10.1016/S0305-750X(96)00103-9)
- Bashir, M. K., & Azeem, M. M. (2008). Agricultural credit in Pakistan: Constraints and options. *Pakistan Journal of Life and Social Sciences*, 6, 47–49.
- Bashir, M. K., & Mehmood, Y. (2010). Institutional credit and rice productivity: A case study of District Lahore, Pakistan. *China Agricultural Economic Review*, 2, 412–419. <https://doi.org/10.1108/17561371011097722>
- Bestler, H. (1985). Screening vs rationing in credit markets with imperfect information. *American Economic Review*, 75, 850–855.
- Blancard, S., Boussemart, J. P., Bric, W., & Kerstens, K. (2006). Short- and long-run credit constraints in French agriculture: A directional distance function framework using expenditure-constrained profit functions. *American Journal of Agricultural Economics*, 88, 351–364. <https://doi.org/10.1111/j.1467-8276.2006.00863.x>
- Chandio, A. A., Jiang, Y., Joyo, M. A., & Rehman, A. (2016). Impact of area under cultivation, water availability, credit disbursement, and fertilizer off-take on wheat production in Pakistan. *Journal of Applied Environmental and Biological Sciences*, 6, 10–18.
- Chandio, A. A., Magsi, H., Rehman, A., & Sahito, J. G. M. (2017). Types, sources and importance of agricultural credits in Pakistan. *Journal of Applied Environmental and Biological Sciences*, 7, 144–149.
- Ciaian, P., & Swinnen, J. F. M. (2009). Credit market imperfections and the distribution of policy rents. *American Journal of Agricultural Economics*, 91, 1124–1139. <https://doi.org/10.1111/ajae.2009.91.issue-4>
- Denkyirah, E. K., Adu, D. T., Aziz, A. A., Denkyirah, E. K., & Okoffo, E. D. (2016). Analysis of the factors influencing smallholder rice farmers' access to credit in the upper east region of Ghana. *Asian Journal of Agricultural Extension, Economics & Sociology*, 10(4), 1–11. <https://doi.org/10.9734/AJAEES>
- Diagne, A., & Zeller, M. (2001). *Access to credit and its impact on welfare in Malawi* (Research report 116). Washington, DC: International Food Policy Research Institute.
- Dries, L., & Swinnen, J. F. M. (2004). Foreign direct investment, vertical integration, and local suppliers: Evidence from the polish dairy sector. *World Development*, 32, 1525–1544. <https://doi.org/10.1016/j.worlddev.2004.05.004>
- Duniya, K. P., & Adinah, I. I. (2015). Probit analysis of cotton farmers' accessibility to credit in northern guinea savannah of Nigeria. *Asian Journal of Agricultural Extension, Economics & Sociology*, 4, 296–301. <https://doi.org/10.9734/AJAEES>
- Ghosh, P., Mookherjee, D., & Ray, D. (2000). Credit rationing in developing countries: An overview of the theory. In D. Mookherjee & D. Ray (Eds.), *A reader in development economics* (pp. 283–301). London: Blackwell.
- Gorton, M., & White, J. (2007). Transformation and contracting in the supply chains of the former Soviet Union: Evidence from Armenia, Georgia, Moldova, Ukraine and Russia". In J. F. M. Swinnen (Ed.), *Global supply chains* (pp. 175–187). Oxon: Standards and the Poor, CABI.
- GOP (Government of Pakistan). (2011). *Pakistan economic survey (2010–11)*. Islamabad: Ministry of Finance, Author.
- Gujarati, D. N. (2009). *Basic econometrics* (4th ed.). New Delhi: McGraw-Hill.
- Hainz, C., & Teksöz, U. (2006). *Access to finance: The role of inside versus outside collateral in transition economies*.
- Ho, G. (2004). *Rural credit markets in Vietnam: Theory and practice* (Grand prize thesis). Macalester College. Retrieved July 12, 2008, from <https://www.aede.osu.edu/resources/docs/pdf/DS7C7NV6-KC9D-AV00-PN7BPPGOKGT7WWW.pdf>

- Hussain, A., & Thapa, G. B. (2012). Smallholders' access to agricultural credit in Pakistan. *Food Security*, 4, 73–85. <https://doi.org/10.1007/s12571-012-0167-2>
- Ibrahim, S. S., & Aliero, H. M. (2012). An analysis of farmers' access to formal credit in the rural areas of Nigeria. *African Journal of Agricultural Research*, 7, 6249–6253.
- Iqbal, M., Munir, A., & Abbas, K. (2003). The impact of institutional credit on agricultural production in Pakistan. *The Pakistan Development Review*, 42, 469–485.
- Jabbar, M. A., Ehui, S. K., & Von Kaufmann, R. (2002). Supply and demand for livestock credit in sub-Saharan Africa: Lessons for designing new credit schemes. *World Development*, 30, 1029–1042. [https://doi.org/10.1016/S0305-750X\(02\)00021-9](https://doi.org/10.1016/S0305-750X(02)00021-9)
- Jan, I., & Khan, H. (2012). Factors responsible for rural household participation in institutional credit programs in Pakistan. *African Journal of Business Management*, 6, 1186–1190.
- Kaino, T. (2005). Rural credit markets in myanmar: A study of formal and non-formal lenders. *Asian Journal of Agriculture and Development*, 4, 3–15.
- Khandker, S. R., & Faruquee, R. R. (2003). The impact of farm credit in Pakistan. *Agricultural Economics*, 28, 197–213. <https://doi.org/10.1111/agec.2003.28.issue-3>
- Ladman, J. R., & Tinnermeir, R. L. (1981). The political economy of agriculture credit: The case of Bolivia. *American Journal of Agricultural Economics*, 63, 66–72.
- Li, X., Gan, C., & Hu, B. (2011). Accessibility to microcredit by Chinese rural households. *Journal of Asian Economics*, 22, 235–246. <https://doi.org/10.1016/j.asieco.2011.01.004>
- Nouman, M., Siddiqi, M. F., Asim, S. M., & Hussain, Z. (2013). Impact of socio-economic characteristics of farmers on access to agricultural credit. *Sarhad Journal of Agriculture*, 29, 469–476.
- Okunade, E. (2007). Accessibility of agricultural credit and inputs to women farmers of Isoya Rural Development Project. *Research Journal of Agriculture and Biological Services*, 3, 138–142.
- Olomola, I. O. (1999). *Reading in agricultural financing small scale farmers in Nigeria*. NISER.
- Sanusi, W. A., & Adedeji, I. A. (2010). A probit analysis of accessibility of small scale farmers to formal source of credit in Ogbomoso zone, Oyo state, Nigeria. *Agricultural Tropica et Subtropica*, 43, 49–53.
- Saqib, S., Ahmad, M. M., Panezai, S., & Khattak, K. K. (2016). Access to credit and its adequacy to farmers in Khyber Pakhtunkhwa: The case of Mardan district. *Sarhad Journal of Agriculture*, 32(3), 1–8.
- Sebopetji, T. O., & Belete, A. (2009). An application of probit analysis to factors affecting small-scale farmers' decision to take credit: A case study of the Greater Letaba Local Municipality in South Africa. *African Journal of Agricultural Research*, 4, 718–723.
- Tagar, H. K., & Panhwar, I. A. (2010). Agricultural credit in Sindh: Issues and recommendations. *Australian Journal of Basic and Applied Sciences*, 4, 4099–4106.
- Ugwumba, C. O. A., & Omojola, J. T. (2013). Credit access and productivity growth among subsistence food crop farmers in Ikoale Local Government Area of Ekiti State, Nigeria. *ARPN Journal of Agricultural and Biological Science*, 8, 351–356.
- Vaessen, J. (2000). *Accessibility of rural credit in Northern Nicaragua: The importance of networks of information and recommendation* (Working papers 2000018). Faculty of Applied Economics, University of Antwerp.
- Winter-Nelson, A., & Temu, A. A. (2005). Liquidity constraints, access to credit and pro-poor growth in rural Tanzania. *Journal of International Development*, 17, 867–882. [https://doi.org/10.1002/\(ISSN\)1099-1328](https://doi.org/10.1002/(ISSN)1099-1328)
- World Bank. (2008). *Agriculture for development. World development report 2008*. Washington: Author.



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