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Original Research Article

Factors Affecting Credit Use for Fruit Farms: The Case of Bursa

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ABSTRACT

One of the basic principles of economic development is to increase agricultural production. To increase agricultural production, technological and biological innovations must be implemented by the farmers. However, the capital accumulation required for the implementation of these innovations is not sufficient, especially in small family farms. To provide production inputs and to apply new production techniques and methods, the farmers find the necessary capital by using agricultural credit. Therefore, agricultural financing is critical for the development and growth of the agricultural sector. This study aims to determine the credit usage levels and factors affecting credit usage of fruit growing farms in the province of Bursa, Turkey. For this purpose, a face-to-face survey was conducted with 57 fruit growing farms in the central districts of the province of Bursa. According to the results of the analysis of the data obtained from the surveys, age of the household head, farmers' education level, the maturity of credit and the number of types of cultivated crops were determined to be effective on the credit usage level of fruit growing farms.

Keywords: Credit Use, Agricultural Finance, Access to Credit

INTRODUCTION

The agricultural sector is one of the most strategic sectors in terms of nutrition of the rapidly growing population. In parallel with the economic and technological developments experienced over time, there have been developments in agriculture as well as in all other fields. While agricultural farms initially produced only to meet the needs of the family, they have now become commercial units for market-oriented production. In addition to these changes, reasons such as the fact that the farms are fragmented and scattered, the use of inputs in production at an increasing rate, the increase of agricultural input prices faster than the product prices, the dependence of production on natural conditions, the uncertainties in the yield and prices of agricultural products and the very low capital turnover create capital shortage in farms. This harms the productivity of other production factors and natural resources and thus on farmers' income (Weber and Mussholf, 2012).

Farms with insufficient agricultural income and with no means of saving cannot cover their production costs with their capital to continue their activities. Therefore, where and how farms meet the capital requirements has been an important problem. Due to the increasing capital needs of farms, financing has become an important concept in terms of capital procurement and utilization. For this reason, much research has been carried out on issues such as the use and importance of credit in farms and the determination of the factors affecting the credit utilization of producers (Gans and Stern, 2003, Katchova 2005, Dreher et al. 2018, Hardesty and Salgia 2004, Cole 2009, Barry and Robison 2001, Reyes et al. 2012, Ekwere and Edem 2014, Quartey et al. 2012, Temesgen et al. 2018, Brewer 2019, Ahmad 2011, Balogun and Yusuf 2011, Das et al. 2009, Gandhimathi and Vanitha 2010, Nouman et al.).

The agricultural sector is trying to meet the increasing financing needs from organized and unorganized credit institutions (Barslund and Tarp 2008, Bose 1998). While the agricultural sector is financed by organized credit resources in developed countries, the importance of unorganized credit resources is at a considerable level in Turkey. The requirement of more capital due to reasons such as increased use of inputs in agricultural production, risks, and uncertainties, etc., caused the agricultural sector in Turkey to use credit more from organized credit institutions. The essential role in the credit given to the agricultural sector in Turkey belongs to the state-owned banks and Agricultural Credit Cooperative Associations. However, in recent years, the interest of private banks in the agricultural sector has increased and lending activities have started with special loan products.

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Regarding the credit usage of farms, this research aims to determine the credit utilization levels, areas of credit utilization and the factors that affect the use of credit of the fruit growing farms in the central districts of the province of Bursa.

MATERIALS AND METHODS

This research aims to determine the sources of finance which are important in the financing of farms, the amount and time of credit use and the problems they face in repayment. However, the study also aims to determine the factors, which affect the level of credit utilization of producers from financing sources, in terms of demand. Factors affecting the credit utilization of producers are important because they are both guiding for financial institutions and show the situation of the producers using credit.

Primary data were obtained from face-to-face questionnaires conducted with fruit growing enterprises of the central districts of Bursa Province, where credit utilization rate is high.

The number of villages to be surveyed was gathered from the number of villages suitable for the research using purposive sampling method (Palinkas et al. 2015). In line with the information obtained from the research area, the villages where fruit-making enterprises, which intensively use credit, are located constitute the population and a total of 7 villages (Ağaköy, Aksungur, Ahmetköy, Çağlıyan, Armutköy, Nilüfer and Çeltik) were purposefully selected. To determine the number of enterprises engaged in fruit production in these villages, the information of the Farmer Registration System (FRS) of the Provincial Directorate of Food, Agriculture and Livestock was used. The study revealed that there were 348 fruit growing enterprises in 7 villages selected from the FRS records. To determine the sample size, the following proportional sample volume formula was used based on 90% confidence level and 10% error margin. This formula is used in the sampling stage of many studies where production areas of agricultural enterprises cannot be properly determined.

$$n = \frac{Np\ (1-p)}{(N-1)\ \ \sigma^2\ px + p\ (1-p)}$$ (Newbold 1995).

In the formula;
n = sample size
N = total number of fruit farms
p = the rate of the farms to be included in the sample
σ^2px = the variance of the rate

To ensure that the sample size is as large as possible, it is appropriate to accept p = 0.5, which will give the largest value in the sampling. As a result of the calculation, it was determined that 57 farms should be selected as examples from the population of 348 farms.

Considering that the fruit growing farms in the Central Districts of Bursa generally use more credit than other farms, 57 fruit growing farms were interviewed face-to-face to determine the demographic characteristics, agricultural production pattern, credit utilization levels and factors affecting credit utilization of the enterprises that used credit.

The data collected by the questionnaire were analyzed through SPSS package program. Information regarding descriptive statistics of the sample and spearman correlation analysis between variables (Myers and Sirois, 2006) is given. Also, regression analysis was used to determine the factors affecting credit utilization level. Stepwise-Backward method (Telmo et al. 2010) was chosen as the regression method and the study aimed to reach the regression model with the highest explanatory power.

RESULTS AND DISCUSSION

The surveyed farmers were divided into three groups as young (up to 35 years), middle aged (36–50 years) and old (51 years and over). As can be seen in Table 1, the ratio of middle-aged and old farmers is equal to each other and is considerably higher than the rate of young farmers. Only 8.8% of the business farmers are under 35 years of age.

Table 1. Descriptive Characteristics of the Surveyed Farms.

Categories	Frequency	%	Categories	Frequency	%
Age			**Farm Size (Decares)**		
≤ 35 (Young)	5	8.8	≤ 20	5	8.8
36-50 (Middle-aged)	26	45.6	21–40	21	36.8
51 ≥ (Old)	26	45.6	41–60	23	40.4
Total	57	100.0	61 ≥	8	14.0
			Total	57	100.0
Educational Status			**Business Ownership**		
Primary School	25	44	Owner	43	76
Secondary School	24	428.8	Tenant	4	6
High School	8	14	Owner + Tenant	10	18
Total	57	100.0	Total	57	100.0
Operating Period (Years)			**Annual Agricultural Income (TRY)**		
50 ≥	2	3.5	≤ 20 000	3	5.3
40–49	15	26.3	21 000–40 000	23	40.3
30–39	18	31.6	41 000–60 000	19	33.3
20–29	14	24.6	61 000–80 000	3	5.3
≤ 19	8	14.0	81 000–90 000	1	1.8
Total	57	100.0	91 000≥	8	14.0
			Total	57	100.0

There is no illiterate among the surveyed farmers. Also, there are no non-primary school graduates, college and university graduates. 44% of these farmers (the greatest share) are primary school graduates, 42% secondary school graduates and 14% high school graduates (Table 1).

31.6% of the fruit growing farms surveyed have been engaged in agricultural activities for 30–39 years, 26.3% for 40–49 years, and 24.6% for 20–29 years. The rate of farms operating for 19 years or less is 14% and the rate of farms operating for 50 years or more is 3.5%. 76% of the farms are producers as landowners and 6% are as tenants. The proportion of the farmers whose land is partially self-owned and partially rent is 18% (Table 1).

Of the 57 farmers, the number of farmers using TRY 51,000 and more credit is 5, 4 of which are in the elderly category. 6 out of 10 farmers using credit of TRY 10,000 or less are middle-aged and 4 are elderly. 30 of the farmers are in the range of TRY 11,000 – 30,000 credit utilization (Table 1).

As can be seen in Table 2, 40.4% (which is a significant percentage) of the surveyed farms have a land of 41-60 decares. While the farms that have land of 21-40 decares have a share of 36.8%, 14% have 61 decares and more, and 8.8% have 20 decares and less.

13 different crops are grown in the central districts of Bursa which are olives, pears, peaches, apples, figs, quince, plums, grapes, melons, watermelons, walnuts, cherries and Trabzon persimmon. There is no specialization in a single crop in the farms. Farms produce more than one type of fruit. Within the scope of the survey, it was determined that the enterprises cultivated at most 5 fruit species. The group with the highest concentration (45.6%) is composed of farms growing 3 types of fruit. The group with the least concentration with 7% is the farms where 5 fruit species are grown.

The agricultural income range of the farms was determined by the figures given by the farms surveyed. Table 1 reveals that 40.3% of the farmers are concentrated in the agricultural income range of TRY 21,000–40,000.

The share of those having an annual agricultural income between TRY 41,000-60,000 is 33.3% and those with TRY 91,000 and above is 14%. The ratio of those using credit of TRY 20,000 or less and those in the range of TRY 61,000-80,000 is 5.3%, while the ratio of those using credit between TRY 81,000–90,000 is 1.8%.

Table 2. Distribution of Farms According to the Amount of Use of Credit.

Credit Amount Used (TRY)	Age			Educational Status			Land Size (decares)				Annual Agricultural Income (TRY 1000)					
	Young	Middle-Aged	Elderly	Primary School	Secondary School	High School	≤20	21-40	41-60	61≥	≤20	21-40	41-60	61-80	81-90	91≥
≤ 10 000	0	6	4	8	2	0	1	8	1	0	0	8	1	1	0	0
11 000–30 000	5	13	12	14	14	2	3	7	14	6	1	11	11	2	0	5
31 000–50 000	0	6	6	2	5	5	1	5	5	1	1	3	5	1	0	2
51 000 ≥	0	1	4	1	3	1	0	1	3	1	1	1	2	0	0	1
Total	**5**	**26**	**26**	**25**	**24**	**8**	**5**	**21**	**23**	**8**	**3**	**23**	**19**	**4**	**0**	**8**

As can be seen in Table 2, when the farmers are examined by considering their educational level and the amount of credit usage, it is seen that the most concentrated primary and secondary school business managers are between the TRY 11,000-30,000 credit utilization levels. The majority of high school graduates use credit between TRY 31,000-50,000.

Purpose of Usage of Credits

Farms need production input to continue their activities. Therefore, since a large portion of the credits received is used to finance production inputs, more working capital credits are needed. As can be seen from Table 3, 61.4% of the farms use working capital credit the most and 38.6% use the investment credit.

Table 3. Purpose of Usage of Credits.

The credit types	Number of Farms	%
Working capital credit	35	61.4
Investment credit	22	38.6
Total	**57**	**100**

Credit Usage Periods

77% of the farms, which consists of a significant portion of them, use credits most during the planting and maintenance period. The rate of farms using credit during the harvest period is 16%, while the rate of using credit during storage is 7% (Table 4).

Table 4. Credit Usage Periods.

Credit Usage Period	Number of Farms	%
Harvest Period	9	16
Planting – Maintenance Period	44	77
Storage Period	4	7
Total	**57**	**100**

Credit Periods

63.2% of farms use medium-term credit, 24.5% use long-term credit, and 12.3% use short-term credit (Table 5).

Table 5. Credit Periods**.**

Period	Number of Farms	%
Short-Term	7	12.3
Medium-Term	36	63.2
Long-Term	14	24.5
Total	**57**	**100**

Table 6. Credit Usage Amount and Distribution of Farms to Credit Periods

Credit Usage Amount (TRY)	Number of Farms			Total
	Short-Term	Medium-Term	Long-Term	
≤ 10 000	6	4	0	10
11 000-30 000	0	23	7	30
31 000-50 000	0	8	4	12
51 000 ≥	1	1	3	5
Total	**7**	**36**	**14**	**57**

Of the 36 enterprises using medium-term credit, 23 use credit amount of TRY 11,000-30,000, 8 use credit amount of TRY 31,000-50,000, 4 use credit amount of TRY 10,000 and below, and 1 use credit amount of TRY 51,000 and more (Table 6).

Difficulties in Receiving Credit

Formality length (42.1%) is one of the main difficulties encountered in using credit. 24.6% of farmers complain about the provision for credit, 14% complain about high interest rates and 12.3% complain about insufficient credit. 3.5% of the farmers stated that they had difficulty due to the insufficiency of credit and the fact that they were not given in time (Table 7).

Table 7. Difficulties Faced by Farms While Receiving Credit.

Difficulties While Receiving Credit from Banks and Cooperatives	Number of Farms	%
High Interest Rates	8	14.0
Credit Insufficiency	7	12.3
Shortness of Credit Period	2	3.5
Credit Not Given in Time	2	3.5
Formalities Taking a Long Time	24	42.1
Provision for Credit	14	24.6
Total	**57**	**100**

Reasons Causing Problems in Credit Repayment

Of the 57 farms surveyed, 38 farms had problems in repayment of credit and 18 of these farms (47%) had problems due to the uncertainty of prices of agricultural products, 16 (42%) of them had problems due to the uncertainty of yield in agricultural production, 14 (37%) of them had problems due to the fact that agricultural production largely depends on climatic conditions, 12 (32%) of them had problems due to the disharmony of time between income and expenses, 4 (10%) of them had problems due to the fact that agricultural loans were used for the purpose of private consumption (Table 8).

Table 8. Reasons Causing Problems in Credit Repayment.

Reasons Causing Problems in Repayment	Number of Farms*	%
Uncertainty of Prices in Agricultural Products	18	47
Agricultural Production Largely Depending on Climatic Conditions	14	37
Disharmony of Time Between Income and Expenses	12	32
Uncertainty of Yield in Agricultural Production	16	42
Usage of Agricultural Loans for the Purpose of Private Consumption Expenditures	4	10

***Multiple answers were given by the producers.

Factors Affecting Agricultural Credit Utilization Level of Fruit Growing Farms

Using Spearman correlation analysis, the relationship between the amount of credit used and other variables were examined (Table 9). It was determined that there were statistically significant relationships at different significance levels between the amount of credit used and land size, non-agricultural income, the level of education of the farmers, the credit period and the number of crops grown in the farms. The amount of credit use is positively correlated with the increase in land size, education period, experience and number of crops. However, there is a negative relationship between the amount of credit used and non-agricultural income.

Table 9. Variable Correlation Analysis (Spearman Correlation).

	Credit Amount	Age	Land	Years of Activity	Agricultural Income	Non-Agricultural Income	Education	Period	Problems in Repayment	Number of Products
Credit Amount	1.000	.151	.286(*)	.074	.160	-.310(*)	.483(**)	.414(**)	.074	.547(**)
Age		1.000	-.033	.662(**)	-.143	-.116	-.160	.117	.095	.001
Land			1.000	.098	.747(**)	-.367(**)	.134	.217	-.104	.511(**)
Years of Activity				1.000	.005	-.012	-.196	.151	.040	.035
Agricultural Income					1.000	-.472(**)	.051	.200	-.346(**)	.412(**)
Non-Agricultural Income						1.000	-.268(*)	-.050	.292(*)	-.324(*)
Education							1.000	-.014	-.014	.337(*)
Period								1.000	-.077	.277(*)
Problems in Repayment									1.000	-.026
Number of Products										1.000

* Correlation is significant at 5% significance level, ** : Correlation is significant at 10% significance level.

Regression analysis was performed to examine the relationship between the independent variables and credit usage level assuming that credit usage level is the dependent variable and the independent variables are the age of business manager, size of land, years of activity, agricultural income, non-agricultural income, education level, credit period, repayment problem and the number of products. The Stepwise-Backward method was chosen as the regression method and the model with the highest explanatory value was determined (Table 10).

Table 10. Factors Affecting Credit Usage Level.

Dependent Variable: Credit Usage Level				
Independent Variables	**Coefficients**	**Standard Error**	**t values**	**Levels of Significance**
Constant Term	46166.057	16139.676	-2.860	006*
Age	460.410	273.273	1.685	.098***
Education	6462.112	2983.361	2.166	.035**
Credit Period	8686.767	3342.861	2.599	.012**
Number of Products	7350.837	2470.852	2.975	.004*
	F = 9.349*	R^2=0.418	Adjusted R^2=0.374	

t value is significant; *: at 1% significance level, **: at 5% significance level, ***: at 10% significance level.

As can be seen from Table 10, the F value was found to be 9.349 and shows that the model as a whole is significant at a 1% significance level. The adjusted R^2 value of the model occurred as 0.374. Independent variables of the model explain the dependent variable at a 37.4% level. The independent variables that affect the agricultural credit utilization levels of fruit growing farms were determined as the age of the farmers, education level, credit period and the number of crops (Table 10). These independent variables were positively correlated with the level of credit usage, which is the dependent variable, and they were statistically significant.

Table 10 reveals that age positively affects the usage of credit at a 10% significance level. As the age of the farmer increases, the amount of credit usage increases accordingly.

The education level of the farmer positively affects the credit usage level at a 5% significance level. As the education level of the farmer increases, so does the credit utilization level. Based on this finding, it can be concluded that the farmer with higher education levels are more knowledgeable about agricultural credit products and benefit from the advantages of using agricultural credit more than the ones with low education levels. Similar results were obtained in other studies as well (Temesgen et al., 2018; Katchova, 2005).

Again in Table 13, it is possible to observe that there is a positive relationship between credit usage level and credit period. The period of the credit used positively affects the level of credit utilization at a 5% significance level. It is possible to indicate that this positive relationship between credit period and usage is due to the fact that the fruit and vegetable farms, of which the production is dependent on natural conditions, gravitate to long-term credit as a result of uncertain and inadequate income as a result of the risks and uncertainties in production, thus the credit period length of the repayments of the credit has an advantage for the farm.

The last independent variable examined in the regression analysis, the number of crops grown in the farm positively affects the credit utilization level at a 1% significance level. The amount of credit used increases due to the increase in the number of products of the fruit farms in the sample. A similar result was also expressed by Katchova (2005). Agricultural production inputs required for the cultivation of each crop vary. With increasing costs, it is possible to state that farms need more credit usage.

CONCLUSIONS

The facts that the vast majority of farms in Turkey are small and they have low annual income do not allow them to make savings. For high productivity and profitability in farms, fixed capital and working capital must be balanced. Therefore, farms have to cover their equity capital deficiencies from credit institutions. The organizational structure of agricultural credit in Turkey reveals that there are two important elements of this structure. On the one hand, there are organized, institutionalized credit resources including state banks, Agricultural Credit Cooperatives and in recent years private banks and on the other hand, there are unorganized resources that mostly rely on persons.

Although there has been an increase in total agricultural credit utilization over the years, the credit utilization amounts of other sectors have also been increasing rapidly. Most of the farms in Turkey survive thanks to agricultural loans. However, these loans are not sufficient to meet the need. The fact that this ratio is so low should not mean that the producers have sufficient equity capital. It is possible to indicate that this is due to the producers' hesitation from borrowing, excessive formality, shortage of collateral, lack of agricultural credit sources and high interest rates.

According to the results of the surveys, 8.8% of the fruit growers central districts of Bursa are 35 years of age and under. The numbers of farmers with age ranges between 35–50 and 51 and above are equal to each other and their share in the total is 45.6%. There are no illiterate among farmers. 44% of the farmers are primary school graduates, 42% are high school graduates and 14% are secondary school graduates. Based on these rates, it is possible to state that the level of education of the farmers in the research region is low. 31.6% of the farms in the districts have been engaged in agricultural activities for 30–39 years, 26.3% for 40–49 years, and 24.6% for 20–29 years. The rate of farms operating for 20 years or less is 14% and the rate of farms operating for 50 years or more is 3.5%. The average land size of the farms is 44.5 decares and 40.4% of the farms are between 41-60 decares. The tenancy is not very common. In 76% of the farms, the owner of the land and the farm is the same

person. Agricultural income is concentrated between TRY 21,000 and 50,000. While 58% of the enterprises have only agricultural income, the remaining 42% have non-agricultural income.

Agricultural loans are mostly used to finance working capital needs. 61.4% of the farms, which comprise the majority, use working capital credit. The reason why the investment credit utilization rate in fruit growing is low (38.6%) can be explained by the fact that fruit trees are perennial and the land is inherited from father to son. The study exhibited the fact that the credit was needed especially during the planting-maintenance period. 77% of the farms use agricultural credit in the planting-maintenance period, 16% in the harvest period and 7% in the storage period.

Most of the farms use medium-term loans. This can be attributed to the spread of credit repayments over the long term and the fact that the monthly credit amount is less than short-term credits.

The farmers in the region stated that they faced many obstacles when receiving credit from banks and cooperatives. 42.1% of the farmers stated that they were complaining about the length of formality in credit usage. Also, the provision for the loan (24.6%), high interest rates (14%), shortage of credit (12.3%), short-term maturity (3.5%), and non-availability of loans (3.5%) are their other problems in the use of credit.

In the periods when they do not use credit, the farmers finance their activities by using their savings (79%), employing more family members (5%) and using fewer inputs (16%). The study concluded that 61.4% of the producers experienced difficulties in paying their credit. 47% of these producers stated that they had difficulties due to price uncertainty in agricultural products, 42% due to uncertainty of yield in agricultural production, 37% due to the fact that agricultural production is largely dependent on climatic conditions, 32% due to lack of time harmony between income and expenses, and 10% due to the use of credit obtained for agricultural production in private consumption expenditures.

62% of the farms stated that they suffered from credit repayment and also indicated that this was mainly due to price uncertainty in agricultural products, the uncertainty of yield in agricultural production and the fact that agricultural production was largely dependent on climatic conditions.

According to the results of the regression analysis conducted with the survey data, the factors affecting the credit utilization level of the fruit growing farms in the central districts of Bursa within the scope of the sample were found to be the age, educational status, credit period and the number of crops. All variables in the analysis were found to be positive and statistically significant with the level of credit usage, which is the dependent variable.

The interviews with the fruit growing farms in the central districts revealed that a significant portion of the agricultural production costs was covered by agricultural loans. The fact that the farms are close to the center creates the advantage of easy access to agricultural credit resources. This situation contributes to the development of the province of Bursa in terms of the agricultural sector.

As observed in the fruit growing farms in the central districts, easy access to financing facilities and deploying credit have been effective for these farms in having an important place in the agricultural economy. As can be understood from this point, agricultural farms are of great importance for the development of the country's economy as well as contributing to the development of the agricultural sector by meeting the financing need. In countries where financing needs are met on time and used extensively, the agricultural sector is developing rapidly. Therefore, this sector also contributes to the economy by developing.

There are some deficiencies in agricultural credit applications and credit utilization efficiency in Turkey. To overcome these deficiencies, first, the adequate size of the farm should be determined for each region and land consolidation should be done. The resources of the institutions that give loans to agriculture should be expanded and cooperation should be provided between these institutions.

Most of the producers in Turkey survive with bank loans and they pay their loan debt from one bank with another bank loan. To eliminate the problems experienced in repayments, interest rates should be determined by considering the characteristics of the agricultural sector. Also, the loans should be medium-term and long-term which are sufficient to meet the needs of agricultural farms. The number of institutions and organizations that give loans to agriculture should be increased by developing agricultural credit resources.

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