

COMPETITIVENESS OF DAIRY AGRIBUSINESS ENTITIES: ASSESSMENT, GROWTH STRATEGY

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An assessment of the competitiveness of individual subjects of the dairy agribusiness of the Oryol region in comparison with each other and with the average competitor of the region was made, their positions in the market, competitive advantages were identified, and a strategy for increasing their competitiveness was determined.

Key words: competitiveness, dairy agribusiness entities, competitiveness of dairy agribusiness entities, competitiveness assessment, competitive advantages, growth strategy.

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GOVERNMENT EXPENDITURE ON AGRICULTURAL SECTOR: ITS EFFECTS ON ECONOMIC GROWTH IN RWANDA

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Abstract. This article examines the factors influencing farmers' access to agricultural credit in a district of Nyabihu Western province, Republic of Rwanda. Multistage sampling through a structured questionnaire was used to collect data from 168 subsistence landholders. The empirical results of the heteroscedasticity corrected and weighted least squares regression with robust standard errors revealed that education, farming experience, total landholding, monthly income, family size, and proportion of owned land were significant factors in farmers' access to credit. The findings of this study reveal that socio-economic factors play a key role in farmers' access to agricultural credit. Hence, there is a need for credit policy to address the issues of small farmers. Moreover, the existing credit policy could be amended to protect the interest of tenant farmers, who lack collateral security.

Key words: agricultural credit, Nyabihu Western province, government expenditure

Introduction

Agricultural credit is an essential input along with modern technology for increased farm productivity. With minimal savings, agricultural credit is obtained not only by the small- and medium-scale farmers for survival but also by large-scale farmers to increase farm income [6]. The importance of formal sources of credit has increased compared to informal sources in the farming sector. In spite of the increased importance of institutional sources of credit, farmers have limited access to formal credit [5; 7]. Agriculture has been always the predominant sector in Rwanda's economy. It contributed 32 % of GDP in 2019 and is a source of livelihood for 70 % of the rural population. Indeed, agricultural output continues to be a critical driver of economic growth (4.8 % during the 2000–2019 period) [8].

The rural credit market in Rwanda includes both formal and informal sources, play a substantial role in the rural economy [3]. It is very important for farmers in Rwanda to obtain financial support for their social needs, to purchase farm inputs, and to make stable improvements in production. Timely access and availability of credit still problematical to farmers due of different reasons such as: lack of collateral, low education, bureaucracy, corruption and more others.

The effects of socio-economic factors such as age, family size, and income on access to agricultural credit has been well established in the literature [3]. Similar studies have revealed the effect of education on access to credit [4]. Likewise, the literature has highlighted the role of farming experience in credit markets and landholding size is considered as the most important factor in farmers' access to agricultural credit in Rwanda, especially in this region of higher mountains. shortly, it is important to study farmers' access to credit and analyze the current situation. Therefore, this study explores the socio-economic factors influencing to obtain credit in agro-sector.

Study Variables Dependent Variable

Access to agricultural credit was the dependent variable in this study, which was measured as the ratio of the amount of credit received by farmers to their landholding size, as specified in equation:

where; Y_{ij} is as defined above, b_i denotes the coefficients, and ε_i denotes the random error term.

Independent Variables

The following independent variables were used in this study: age, education, experience, health status, family size, monthly income, landholding size, distance, proportion of owned land, and proportion of labor employed in the field. The descriptions, measurements, means and standard deviations of the variables are presented in Table 1.

Regression Model

Weighted least squares regression was employed to explore the factors influencing access to credit. The model was specified as in equation (1):

$$Y_{ij} = f(x_1; x_2; x_3; x_4; x_5; x_6; x_7; x_8; x_9). \quad (1)$$

The empirical model was indicated as in equation (2):

$$Y_{ij} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \varepsilon_i. \quad (2)$$

Using weighted least squares regression, the independent variables were standardized by the variance of access to credit. He data were analyzed using EViews 7 and Gretl.

Prior to estimating the model, multicollinearity was checked for all socio-economic factors where the VIF values were fairly low (less than 3) indicating no multicollinearity; these results are presented along with the regression results in Table 2. In addition, the correlation matrix was generated for all study variables and is shown in Appendix 1. Normality of residuals is shown in Figure 1 with the actual, predicted, and residual plots of the access to credit.

The table 1 shows that education, farming experience, total landholding, monthly income, family size, and owned land proportion were significant for obtaining credit. Education variable significantly influenced farmers' access to credit ($p < .01$).

Table 1. Descriptions, measurements, means, and standard deviations of the variables

Variable	Description	Measurement	Mean	Standard Deviation
Dependent variable				
Y_{ij} Access to agricultural credit	Access to agricultural credit	Specified in equation (1)	1.23	0.94
Independent variables				
X_1 Age	Farmers' age	In years	46.8	13.8
X_2 Education	Farmers' education	Year of schooling	5.6	5.5
X_3 Farming experience	Farming experience	In years	23.9	14.6
X_4 Total landholding	Landholding size	In acres	4.4	4.2
X_5 Distance	Farm distance from river	(Dummy; 1 = Farm within 500 m from Bank)	0.6	0.49
X_6 Monthly income	Average monthly income	In FRW ^a	31,048	17,414
X_7 Family size	Total number of family members	Number	9.1	3.3
X_8 Farm labor	Proportion of family members working as labor in the field out of total family members	Ratio	0.31	0.42
X_9 Owned land proportion	Proportion of owned land of total landholding in acres	Ratio	0.41	0.42

^a FRW stands for Rwandan Franc: the national currency of Rwanda.

Source: Authors' calculation.

This means that a one-year increase in the education of farmers increases probability to agricultural credit by 0.083 units. Similarly, a one-year increase in farming experience increases access to credit by 0.0258 units ($p < .05$). In addition, total landholding was significant ($p < .01$), implying that an increase in the landholding by one acre increases access to credit by 0.216 units. Moreover, an increase in family size by one member increases farmers access to credit by 0.059 units ($p < .05$) independently normally distributed with a zero mean and constant variance. The model had a good fit as implied by the coefficient of determination (R^2 0.55), indicating that 55 percent of the variations in access to credit by farmers was influenced by the independent variables. Indeed, the independent variables significantly influenced farmers' access to credit as indicated by the F-statistic value of 21.36 ($p < .01$). Among the socio-economic determinants, holding significantly increased access to credit ($p < .01$). Lastly, monthly income had a negative significant effect on access to agricultural credit ($p < .01$), although the effect was negligible (Table 2).

Table 2. Empirical results of heteroscedastically corrected weighted least squares regression with robust standard errors

Variable	Coefficient	P	VIF
X ₁ Age	-0.006 (0.009)	.480	1.93325
X ₂ Education	0.083 (0.0274)	.003**	1.41175
X ₃ Farming experience	0.0258 (0.0126)	.042*	2.23938
X ₄ Total landholding	0.216 (0.0333)	.000**	1.76491
X ₅ Distance	-0.172 (0.244)	.482	1.06996
X ₆ Monthly income	-1.31 × 10 ⁻⁶	0.000**	1.20099
X ₇ Family size	0.059 (0.0245)	.017*	1.47649
X ₈ Farm labor	-0.098 (0.073)	.181	1.29894
X ₉ owned land	0.946 (0.332)	.005**	1.59422
Proportion Constant	-0.689 (0.427)	0.109	
Sum squared residuals	1734.193	SE of regression	3.312991
R-squared	0.548896	Adjusted R-squared	0.5232
F (9, 158)	21.36128	P-value(F)	0.000
Log-likelihood	-434.4657	Akaike criterion	888.9314
Schwarz criterion	920.171	Hannan-Quinn	901.61

Significance levels: * ¼ p < .05; ** ¼ p < .01.

Source: Author's calculation. Note: Figures in parentheses are standard errors.

Discussion

The results reveal that farmers' access to credit increased according to higher levels of education due to better technical knowledge, greater understanding of credit markets and facilities, better know-how and farming skills, and familiarity with bureaucratic procedures. It is evident that educated farmers with secondary and higher secondary education had more access to credit than their counterparts with a lower level of education.

It has been mentioned that the education level of farmers enables them to cope with the procedures required for accessing loans. As in many areas, education plays a key role in borrowing decisions and reduces the transaction costs of credit. The results of different studies done before were also in accordance with our findings. They demonstrated a remarkable relationship between access to credit for livestock and education in Republic of Rwanda.

Our research reveal that farming experience showed a positive relationship with access to agricultural credit. In the case of informal sources, farmers with more experience had a better relationship with other farmers, money lenders, and traders.

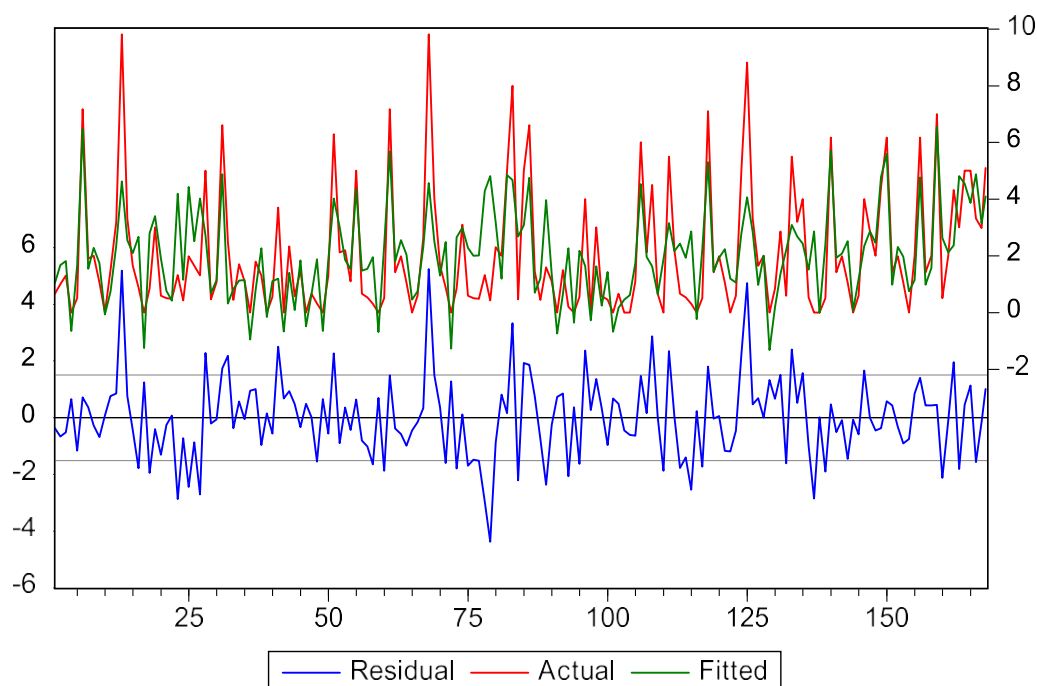


Figure 1. Actual, predicted, and residual values of access to credit model

It is important to mention that: access to credit through formal sources, experience also plays a key role because such farmers would have already dealt with banks several times in the past or have remarkable accounts movement, so they had a better understanding of the terms, conditions and procedure. Our results agreed with other author's findings [2; 7], who all reported a positive relationship between access to agricultural credit and farming experience. Landholding size is considered as a symbol of social status in Rwandan society. Therefore, farmers with large landholding are more likely to access loans from formal and informal sources. In all financial institutions it is well noted that the submission of a land ownership certificate is mandatory for the approval of loan. But the farmers with low landholding size; hence, they are limited to credit access compared to farmers with greater landholdings.

Our study reveals the negative association between monthly income and access to agricultural credit. As the level of income increased, access to credit decreased. This implies that the farmers with higher income had the ability to finance their farming activities by their own resources; that's why, they were not in need of agricultural credit. The empirical results show that family size had a positive relationship with access to credit. As family size increased, dependence on the farm also increased and farmers required credit for agricultural production to provide food and other needs for their family.

Another reason for the positive association is that families with more members can diversify in their agricultural income, generating income with livestock, fruits, vegetables, and other agricultural activities which would otherwise require high amounts of credit. It is also likely that large families would have more contacts with traders and merchants who could help in accessing loans. Our con-

clusions are consistent with previous studies that revealed that access to credit was considerably determined by family size [6].

The results show that as the proportion of owned land increases, informal lenders would be more willing to grant loans to these farmers based on the understanding that these farmers would repay the loans on schedule.

Moreover, the credit policy in particular and agricultural policy in general can be amended to protect the interest of tenant farmers who lack suitable forms of collateral. Authors declare no conflict of interest.

	Y	X1	X2	X3	X4	X5	X6	X7	X8	X9
Y	1									
X ₁	0.326 (0.000)	1								
X ₂	0.473 (0.000)	0.177 (0.022)	1							
X ₃	0.427 (0.000)	0.660 (0.000)	0.221 (0.004)	1						
X ₄	0.634 (0.000)	0.424 (0.000)	0.461 (0.000)	0.413 (0.000)	1					
X ₅	0.028 (0.718)	0.164 (0.033)	0.003 (0.973)	0.087 (0.260)	0.163 (0.035)	1				
X ₆	0.048 (0.538)	0.153 (0.048)	0.218 (0.005)	0.204 (0.008)	0.294 (0.000)	0.084 (0.281)	1			
X ₇	0.358 (0.000)	0.169 (0.028)	0.361 (0.000)	0.224 (0.003)	0.398 (0.000)	0.120 (0.120)	0.350 (0.000)	1		
X ₈	0.114 (0.143)	0.051 (0.511)	0.212 (0.006)	0.118 (0.128)	0.266 (0.000)	0.143 (0.064)	0.247 (0.001)	0.413 (0.000)	1	
X ₉	0.492 (0.000)	0.316 (0.000)	0.353 (0.000)	0.515 (0.000)	0.414 (0.000)	0.001 (0.993)	0.131 (0.090)	0.201 (0.009)	-0.006	1

Source: Authors' calculation.

The findings of this study reveal that socio-economic factors play a key role in farmers' access to agricultural credit. Experience, education, landholding size, family size, and proportion of owned land positively influenced farmers' access to credit, while monthly income had a negative association. Most of farmers were illiterate and lacked collateral security to access credit from formal sources and sometimes from informal sources as well. For improving their agriculture and satisfying the demand on the market farmers need more credit to finance activities. The existence of informal agricultural credit channels in less developed and developing countries highlights the need for a broader assessment of the merits of a well-functioning formal agricultural credit market. A more general perspective is needed for evaluating the nature of the link between agricultural credits and agricultural productivity as well as understanding the main underlying mechanisms.

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ВЛИЯНИЕ ГОСУДАРСТВЕННЫХ РАСХОДОВ В СЕЛЬСКОХОЗЯЙСТВЕННОМ СЕКТОРЕ НА ЭКОНОМИЧЕСКИЙ РОСТ В РУАНДЕ

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В этой статье рассматриваются факторы, влияющие на доступ фермеров к сельскохозяйственным кредитам в районе Западной провинции Ньябиху (Республика Руанда). С помощью структурированного вопросника путем многоступенчатой выборки были собраны данные о 168 землевладельцах, ведущих натуральное хозяйство. Эмпирические результаты показали, что образование, опыт ведения сельского хозяйства, общая площадь владения землей, ежемесячный доход, размер семьи и доля принадлежащей земли являются значимыми факторами доступа фермеров к кредитам. Результаты этого исследования показывают, что социально-экономические факторы играют ключевую роль в доступе фермеров к сельскохозяйственным кредитам. Следовательно, существует необходимость в обновленной кредитной политике для решения проблем мелких фермеров. Кроме того, существующая кредитная политика может быть изменена в направлении защиты интересов фермеров-арендаторов, которым не хватает залогового обеспечения.

Ключевые слова: сельскохозяйственный кредит, Западная провинция Ньябиху, Руанда, государственная поддержка