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Factors associated with smallholder farmers' financial illiteracy in the context of an emerging economy

Access to finance poses a significant challenge for smallholder farmers, influencing the prospects for improving their livelihoods. Financial literacy stands out as a pivotal factor in overcoming this hurdle, playing a crucial role in attaining access to finance, maintaining creditworthiness and fostering economic stability. The objective of this study is to enable an understanding of the financial literacy level of smallholder farmers and to explore empirically the factors that can be associated with their financial literacy. The study is based on a field survey using structured questionnaires targeting 506 smallholder farmers located in different parts of Albania. Descriptive analysis and logit regression analyses are carried out in order to study the relationship between farmers' capacity to calculate credit obligations and their farm assets, access to knowledge, access to financial services and behaviours related to financial record keeping. The ability to correctly calculate the value of the credit costs has been found to be positively associated with access to previous training, experience with application for accessing subsidies, access to a bank account, and their habit of financial keeping records.

Keywords: financial literacy, credit costs, accounting competence, Albania.

JEL classifications: Q12, Q14

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Introduction

Access to finance stands as a pivotal determinant influence on the growth and modernisation of the agricultural sector. In developing and transitioning economies, credit plays a vital role in facilitating agricultural sector expansion by enhancing farmers' purchasing power for inputs, resulting in increased quantities and improved quality. In addition, credit empowers the adoption of advanced agricultural technologies, thereby boosting productivity (Chandio *et al.*, 2020; Yuni *et al.*, 2022).

Farmers' access to finance is influenced by the availability of assets, as well as socio-economic factors such as farmers' education, awareness, social capital, and reputation, demanding a deeper analytical understanding. Poor financial literacy is identified as a common constraint for credit in rural households in developing and emerging economies (Murendo and Mutsonziwa, 2017). Previous evidence suggests that financial literacy impacts farmers' performance and well-being in different ways, depending on personal characteristics such as education level, gender, and monthly income (Thongrak *et al.*, 2021). Indeed, studies have shown the farmers' education influences positively not only farm but also non-farm income, which in turn enhances household farm access to finance (Nguyen *et al.*, 2021). Despite the importance of financial literacy in terms of access to finance and overall farm performance, there is limited research on this topic in many developing and transition economies, including Albania, which is the focus of this paper.

Albania is a post-communist transition economy, which shifted from a planned economy (when all sectors of the economy, including farming and banking, were owned and managed by state structures) to a fragile market economy during the early 1990ies (Zhllima *et al.*, 2010). The planned economy was characterised by the absence of private banks, restrictions on loans by state-run banks and low-interest rates on savings (Imami *et al.*, 2020). The agriculture sector

is struggling to achieve competitiveness and remains for the time being stalled in what may be characterised as an early phase of development dominated by small farms – with small farm size (average 1.2 ha) and high fragmentation, a legacy of post-communist land reform (Zhllima *et al.*, 2010). Small farm size and high fragmentation undermine efficiency and market access (Shahu *et al.*, 2023), while farm growth is partially constrained by limited access to (financial) resources.

Despite macroeconomic stability in the last two decades, access to financing remains a significant challenge for the development of the agricultural sector in Albania. The agriculture sector also grapples with significant problems arising from a high degree of informality and widespread recordkeeping deficiencies, affecting both financial records and production process documentation. This not only affects farm performance but also makes it hard for banks to evaluate their farming clients due to a complete absence of reliable internal recordkeeping amid high informality overall. Consequently, the sector is underserved by the financial services sector: the proportion of loans for the agricultural sector in the total loan portfolio remains low, staying well below 2% (FAO, 2020).

While literature on estimating and understanding farmers' capacity in developing and transition countries to calculate credit costs is limited (Nguyen *et al.*, 2021; Yuni *et al.*, 2022), it is even scarcer in Albania. An earlier study conducted by the Bank of Albania in 2013 (Ceca *et al.*, 2013) assessed the financial inclusion, knowledge, behaviour, and attitudes of surveyed Albanians regarding various aspects of managing personal or family finances. The lack of financial education emerged as a prevalent issue, affecting more than two-thirds of the Albanian population. Other studies, such as those by Nano and Cani (2013), Agalliu (2014), Mexhuani *et al.* (2018), Plakalović *et al.* (2019) and Çera and Tuzi (2019), provide insights into financial education challenges in Albania. However, these studies do not

deal with farmers’ financial literacy and calculation capacities levels and determinant factors.

This study aims to assess the financial literacy level of smallholder farmers and empirically explore factors associated with financial literacy based on a structured survey including 506 smallholder Albanian farmers. The research employs descriptive statistics and logit regression analysis to examine the correlation between farmers’ capacity to calculate credit obligations and their farm assets, access to knowledge as well as access to technologies and services. The study provides valuable findings and recommendations for researchers and financial institutions interested in improving smallholder access to the financing sector.

The remainder of this paper is structured as follows: a comprehensive literature review examining the determinants of financial literacy precedes the methodology section, which includes discussions on data and procedures. The results section then presents detailed findings from the analysis, including outcomes pertaining to formulated hypotheses. Lastly, the paper concludes by synthesising key insights derived from the study and discussing their implications.

Literature review

As highlighted in the introduction, the nexus between access to finance and overall farm performance is intricately linked to financial literacy and the farmers’ proficiency in calculations of costs and incomes (Adomako *et al.*, 2016; Bongomin *et al.*, 2017). Entrepreneurial competencies exhibit a positive correlation with the financial performance of farmers (Nieuwoudt *et al.*, 2017). In the realm of financial literacy literature, there is a notable emphasis on the role of mathematical competence in acquiring financial mathematical literacy knowledge (Gaurav and Singh, 2012; Yildirim and Vardari, 2020). Given the limited exploration of this knowledge component, this study investigates the extent of farmers’ accounting knowledge through a straightforward direct test question. Financial illiteracy is interpreted through

the lens of the farmers’ ability to accurately calculate credit interest costs, assessed through simple direct questions in the form of calculus exercises.

There are various factors influencing the level of farm competences. Figure 1 depicts some of the main factors (based on the literature review), categorised into head of household’s characteristics, family farm characteristics and relevant behavioural and access factors.

Several authors have studied the farmers experience with financial institutions and markets. Sivakumar *et al.* (2013) found that having a bank account is significantly associated with farmer’s financial literacy. Authors also discovered that the duration of relationships with the bank and the frequency of bank visits does positively influence financial literacy. Gaurav and Singh (2012) found that financial experiences are correlated with achievements in customised tests assessing mathematical and probabilistic abilities, considered as two components of cognitive ability and financial literacy. Consequently, we have formulated three inter-related hypotheses reflecting farmers experience with financial services, namely: our first hypothesis posits that possessing a bank account is expected to correlate with a higher capacity to estimate credit costs (Hypothesis 1); similarly, possessing a savings deposit is associated with higher financial literacy (Hypothesis 2); and the higher the credit experience, the higher is the financial literacy of the farmer (Hypothesis 3).

Poor (or lack of) recordkeeping of expenditures and income as well as failing to calculate costs and profits for their main products are deemed as a serious problem for many Albanian farmers and that affects the making of sound financial decisions and access to finance (FAO, 2020). Hence, our fourth hypothesis (Hypothesis 4) suggests that farmers who maintain records of costs and incomes are more adept at estimating credit costs.

The farmers’ ability to gather information on credit costs (Antwi and Ohene-Yankyira, 2017) is an important component of farmers’ knowledge accumulation. Thus, access to the internet enhances farmers’ knowledge on how to inter-

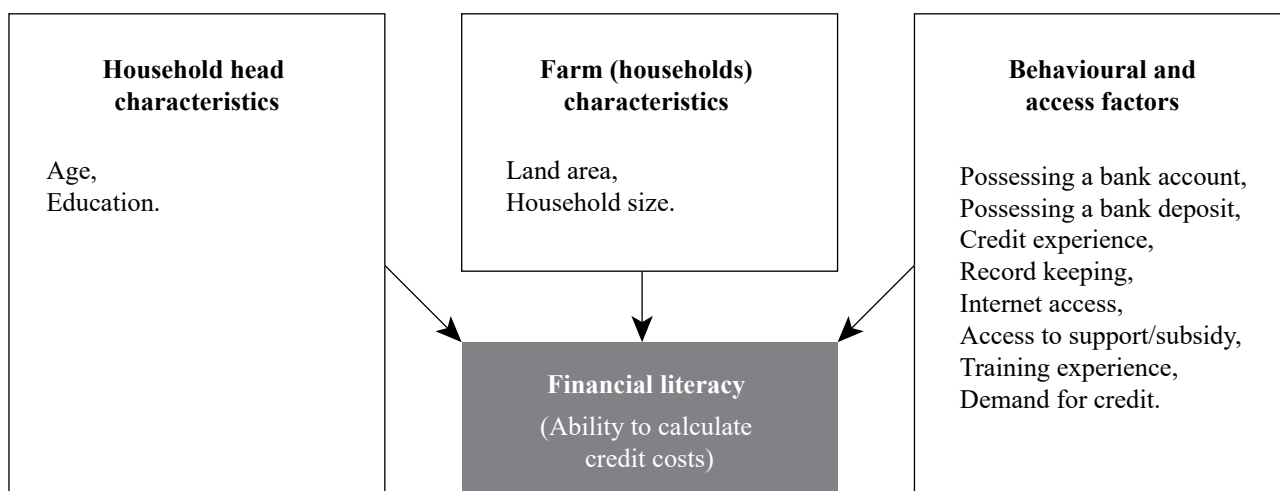


Figure 1: Conceptual framework for exploring the factors influencing the financial literacy.

Source: Authors own elaboration

pret credit costs, potentially increasing their attention to calculating credit interest costs. Our next hypothesis is that farmers with access to (mobile) internet are also more capable of calculating credit costs (Hypothesis 5).

Aid programmes, namely government budgetary support programmes, have usually a direct benefit based on their focus (enhancing investments, reducing yearly costs, increasing access to technology or knowledge) as well as indirect effects (improving quality and safety or increasing or formalising the farming activities and increasing farmers education). In the context of an application for grants/subsidies, it is often required to submit a business plan, including financial analysis. Increasing farmers' competence in this regard may enable them to benefit from farm subsidy programmes sooner. Thus, it is expected that farmers applying for subsidy support programmes are also more able to calculate credit costs (Hypothesis 6).

Our study examines two factors that have received limited attention in the literature. First is the participation in training. Drawing from Su *et al.* (2018) and Sivakumar *et al.* (2013), we explore the effect of previous participation in training and capacity-building programmes. For instance, Su *et al.* (2018) found that respondents who engage with educational programmes are more likely to be financially literate. Accordingly, we posit that farmers with access to previous training on farm management are more proficient in accounting skills (Hypothesis 7). The other factor is the demand for credit. The demand for credit increases farmer's efforts to understand credit costs. Entering and negotiating with various institutions on credit offers make farmers more prepared to estimate costs. Thus, we expect that the higher the demand/need for credit the larger is their ability for assessing credit costs (Hypothesis 8).

Various farmers' characteristics, including education, gender, age, experience, and income, have been linked to farmers' literacy (Gaurav and Singh, 2012; Lalrinmawia and Gupta, 2015; Gaisina and Kaidarova, 2017; Levantesi and Zaccchia, 2021). Other studies emphasise the significance of household-related variables influencing literacy, such as household size, the size of labour used in the farm, or the size of the farm (Lalrinmawia and Gupta, 2015; Sivakumar *et al.*, 2013). These factors are incorporated as control variables in the context of the empirical analysis.

Data and methods

This paper is based on a structured face-to-face survey conducted in 2020 with 506 farmers in different parts of Albania (from north to south) including Peshkopi, Maliq, Librazhd and Kurbin. The survey design and overall implementation were guided by the authors of the study. Some of the issues included in the structured questionnaire were: 1. Family farm demographics (age, education and gender); 2. Structure of the farm and economic activities (crops, livestock and others): inputs, production, sales; 3. Aspects related to financial management and education (keeping records and knowledge about the calculation of costs and income, budgeting, understanding different financial institutions, etc.); 4. Participation in various forms of financial

education and their perception and views of financial institutions and services; and 5. Farmers' relations with micro-finance institutions/banks and their working capital (micro-finance institutions, banks, government, donors, relatives, remittances, borrowing from informal lenders, etc.). The questionnaire was tested and refined accordingly before data collection began.

Survey data was collected using tablets, which facilitated automatic and fast data entry into a CSPro database. The data was converted in an Excel database and transferred to SPSS, a specialised package, with a view to this being used as the main tool for processing the results and statistical analysis.

Questionnaires were conducted with family farms' representatives. The average age of the head of the household/farm manager is 52 years with a standard deviation of 10.4 years. In all four regions included in the structured survey, male heads of households dominate. The average family size is 4.5 members. The average monthly expenses are around €410 with a standard deviation of approximately €200.

Table 1: Descriptive statistics of the sample.

Category	Mean	Std. Dev.
Age of household head	52.09	10.42
Number of family members	4.53	1.47
Expenses monthly family (euro)	410	195.90

Source: DSA Survey (2021)

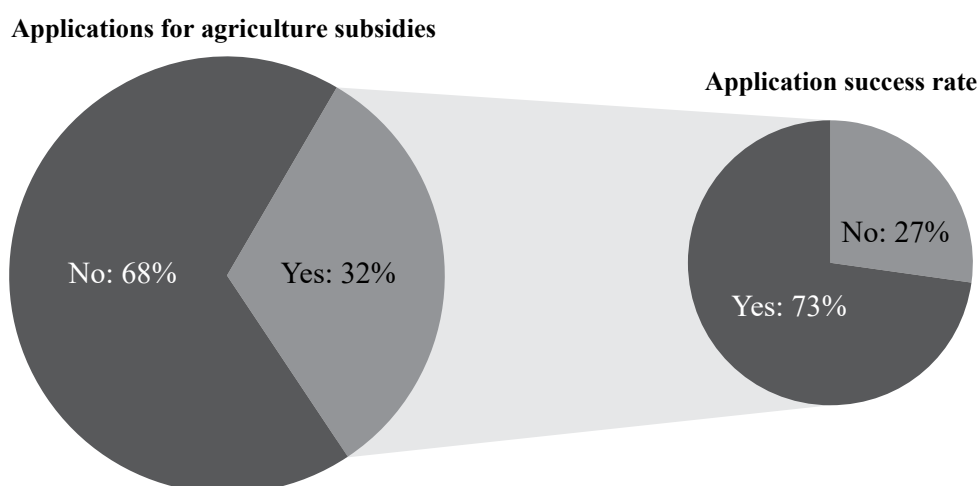
In this paper, operational definitions and types of variables with their respective attributes have been meticulously delineated to investigate the relationship between various factors and financial literacy, specifically focusing on the ability to calculate credit costs. In order to analyse the factors influencing the ability of the farmer to assess credit costs, which have been highlighted in the context of the literature review and the conceptual framework, a binary logit regression is used. The dependent variable takes the value 1 in the case the calculation made was correct and the value 0 if the calculation was incorrect. According to Bergtold *et al.* (2018), the strongest deviations in the estimation of the logistic regression coefficients, possibly even affecting the signs of the coefficients, when there are multicollinearity problems between the variables, occur when the number of data is less than 200, in our case, the number of modelled data is significantly higher than 200. Therefore, the results are considered stable.

Financial literacy, as the outcome concept of our study, was measured using two main approaches. The first approach was to ask farmers if they know how to calculate their obligations when receiving a credit. In addition to this self-declaration of knowledge, farmers were required to calculate the credit repayments based on a simple exercise where the credit amount and credit rate of interest was given. The exercise was to ask farmers to calculate the credit costs in a year for a credit of €1000 with a yearly interest rate of 12%. The correct answers were collected and analysed through a descriptive analysis. Furthermore, the answer converted into a dummy variable is used in our study as the dependent variable (in the context of the

Table 2: Variables used in the regression model.

	Operational definition	Type of variable and related attributes
Dependent variable		
Financial literacy	Ability to calculate credit cost	Dummy variable: 1=correctly calculate the cred it cost; 0=in-correctly calculate the credit cist
Independent Variable		
Age	Age of household head/farm manager	Scale variable expressed in number (of years)
Family size	Number of members in the family	Scale variable expressed in number of members
Education	Education of the head of the household	Scale variable in categories of education 1=Elementary; 2=8-Years; 3=High School; 4=Professional High School; 5=University
Cultivated area	Cultivated land surface	Scale variable expressed in area units (0.1 Ha)
Experience in agriculture subsidies	Have you ever applied for any government subsidy scheme for agriculture?	Dummy variable No=0, Yes=1
Need for credit	Do you usually need small loans to buy inputs?	Ordinal/likert scale; 1= Never, 2=Rarely, 3=Somewhat, 4=Often, 5= Always
Internet access	Possession of smart phone with internet	Dummy variable No=0, Yes=1
Bank account	Possession of bank account in the family	Dummy variable No=0, Yes=1
Deposit	Do you save money in a bank deposit?	Ordinal/likert scale; 1= Never, 2=Rarely, 3=Somewhat, 4=Often, 5= Always
Credit experience	Have you applied for any loan in the last 5 years?	Dummy variable No=0, Yes=1
Keep records (expenses and income)	Do you (you or your family) keep records of the farm's expenses and income?	Ordinal/likert scale; 1= Never, 2=Rarely, 3=Somewhat, 4=Often, 5= Always
Training experience	Have you or other members of your family ever been trained to calculate costs and profit?	Dummy variable No=0, Yes=1

Source: Authors' own elaboration

**Figure 2:** Application for government subsidy schemes and application success rate.

Source: DSA Survey, 2021

regression analysis). It is operationalised as the ability to correctly calculate credit costs, represented as a dummy variable where a score of 1 indicates accurate calculation and 0 denotes incorrect calculation. Explanatory/independent variables such as age, family size, education level, land area, experience in government support, need for credit, internet access, possession of a bank account, deposit behaviour, credit experience, record-keeping practices, and training experience are operationalised through a combination of scale, categorical, and ordinal variables, each with distinct attributes facilitating comprehensive analysis. This meticulous operationalisation ensures clarity and precision in examining the factors influencing financial literacy within the context of the credit calculation.

Results

General situation of farm financial inclusion

The survey analyses results provide indicators of farmers' inclusion in the formal economy. In general farmers' formalisation is still low but growing. More than 55% of the farmers surveyed stated that they were equipped with a tax identification number. In addition, the farmers' inclusion in the government support schemes is relatively low. Approximately 32% of the farmers have applied for the Agriculture and Rural Development Fund programme measures provided in the last 5 years (Figure 2) and more than 70% of them were successful.

Almost all farmers (99%) have affirmed that they buy inputs. Regarding the source of the money used to buy these inputs, approximately 20% of farmers answered that they often or always needed financing to buy inputs. More than 74.7% have affirmed that they use their own savings, 12.8% money rely on money sent by the emigration of family members (remittances), 6.8% borrow from friends and acquaintances, 4% receive loans from input suppliers and buyers and only 1.8% receive bank loans.

Farmers' integration into the banking system remains limited. Only 35% of farmers report having savings within a specific timeframe over the last 5 years, and a mere 4% claim to save annually. Consequently, just 31.3% of respondents indicate having a bank account. The primary use of the banking system is for saving money, yet even in rural areas, this activity remains modest, with only 12% asserting that they can often or always save money.

The adoption of communication technology among farmers is also deficient (Table 3). Proficiency in technology usage can impact access to new methods, including utilising banking applications on mobile phones. Although slightly over 75% of respondents claim to possess smartphones with internet connectivity, only 4.6% state that they have conducted banking transactions through their mobile phones,

Table 3: Farmers access to mobile banking, banking services and their practices related to financial management.

Type of services accessed by farmers	Yes	No
Farmers having smart phone	75.70%	24.30%
Farmers having a bank account (household usage)	31.30%	68.70%
Farmers having a debit card	19.80%	80.20%
Farmers performing mobile banking actions	4.60%	95.40%
Farmers who state to be part (family members) in financial literacy training	72.60%	27.40%
Farmers keeping systematic accounts of incomes and costs	87.90%	12.10%
Farmers currently having a credit /loan	3.55%	96.45%

Source: DSA Survey (2021)

reflecting a significant underutilisation of available technology. Knowledge on technology adaptation is the main reason for the underutilisation.

It is not common for Albanian smallholders to apply for investments credit. The use of credit is based mainly on small amounts demanded for yearly farm operations. The findings show that there is a small share of the respondents applying for credit, corresponding to about 5% of the total.

Farmers' financial literacy

As described in the method section several questions were used to understand farmers' level of illiteracy. It is noted that less than 44% of those surveyed declare that they know how to calculate the amount of credit payments required for a bank credit. In addition, around 35% of the farmers know how to assess the best credit offer in the market. Approximately, 40% of the farmers are aware on the extra credit costs from credit interests.

Based on the self-declaration, as explained in the methodology, farmers were given a simple exercise to calculate the credit repayment - the exercise entails offering a credit of 1000 euros with an interest rate of 12%. The study found that slightly more than 28% of the farmers mistakenly calculated the amount of credit costs to have been repaid.

A research question of the study is to explore the factors associated with the farmers' weak competences. Therefore, considering the attributes of the variable of financial illiteracy, their ability to calculate credit costs, a binary regression analysis is carried. Table 4 presents the findings from the regression analysis by incorporating also various demographic and socioeconomic variables, as discussed in literature review section, to discern their significance in this context.

The availability of banking services, specifically having a bank account, is correlated with enhanced abilities to calculate credit costs (Hypothesis 1). Results show that the odds ratio (probability to be correct versus probability not to be correct) for switching from farmers with no bank account

Table 4: Regression analysis of the factors associated with the ability to calculate correctly the credit interests.

Variables in the equation	B	S.E.	Wald	Sig.	Exp(B)
Age	-0.009	0.010	0.658	0.417	0.992
Family size	-0.143	0.088	2.638	0.104	0.867
Education	-0.070	0.165	0.180	0.672	0.933
Farmed area	0.058	0.025	5.598	0.018	1.060
Experience in government support	0.581	0.335	3.001	0.083	1.787
Need for credit	-0.216	0.110	3.847	0.050	0.806
Internet access	0.385	0.322	1.424	0.233	1.469
Bank account	0.633	0.342	3.421	0.064	1.883
Deposit	-0.081	0.127	0.412	0.521	0.922
Credit experience	-0.162	0.440	0.136	0.712	0.850
Recordkeeping (expenses and income)	0.271	0.125	4.670	0.031	1.311
Training experience	1.431	0.299	22.949	0.000	4.185

Note: Omnibus Tests of Model Coefficients Chi-square=146.522, sig=,000, Cox & Snell R Square=0.346, Nagelkerke R Square=0.461, Hosmer and Lemeshow Test Chi-square=11,040, sig=199.

Source: DSA Survey (2021)

to the one with bank account is 1.883. This means having a bank account is a good predictor of financial literacy. However, Hypothesis 2 (having a bank deposit) and Hypothesis 3 (having previous credit experience) are not confirmed.

The findings show that there is a positive association between record-keeping behaviour and higher competencies, supporting the findings of Hypothesis 4. The odds ratio (probability to be correct versus probability not to be correct) for switching from farmers with no record keeping behaviours to the one with record keeping behaviours is 1.311.

However, Hypothesis 5 is not substantiated, indicating no discernible difference between farmers with access to the internet and smartphones. While Hypothesis 6 is supported, revealing a positive relationship between farms applying before for government support and the ability to calculate credit costs. Results show that the odds ratio (probability to be correct versus probability not to be correct) for switching from farmers with no experience on subsidy application to the one with subsidy application experience is 1.787.

Hypothesis 7 reveals, as expected, a statistically significant positive relationship between farmers' access to training and their ability to accurately calculate credit costs. Results show that the odds ratio (probability to be correct versus probability not to be correct) for switching from farmers with no training experience to the one with training experience is 4.185.

In the case of Hypothesis 8, reverse relation is observed: farmers in need of small credit demonstrate a lower probability of being proficient in calculations. Results show that the odds ratio (probability to be correct versus probability not to be correct) for switching from farmers with no need for credit to the one with need for credit is 0.806.

Among control variable, only land area in ownership appears to have an influence on financial literacy level, with odds ratio for each increase of units of land area with 1.060. Thus, farmers with larger land area exhibit higher competence in the ability to calculate credit costs.

Conclusions

The realm of financial literacy has garnered heightened research attention, especially in the realm of credit market expansion. Scholars are actively investigating the impact of financial literacy and its related factors. The study's findings illuminate the state of financial literacy in a group of Albanian smallholders underscoring the need for more inclusive financial systems that take into account the cognitive and informational constraints of rural households. The analysis delves into the intricate role of financial literacy in agricultural development, revealing the interplay of diverse factors. Specifically, the study evaluates farmers' proficiency in calculating credit costs and the factors influencing this ability.

The results of the regression analysis unveil a significant correlation between farmers' literacy and key farm characteristics, namely household and farm size. The accurate computation of credit obligations is linked to factors such as land/farm area, credit demand, access to banking services (availability of a bank account), record-keeping prac-

tices, and farmers' participation in training. Furthermore, farmers with adept accounting skills are more prevalent among those already utilising banking services, maintaining systematic records of expenditures and incomes, and having undergone training to enhance financial and non-financial capacities.

Stakeholders in agriculture and agribusiness, including advisory services, banking institutions, and educational entities, should intensify efforts to enhance the financial competencies of smallholders. Recognising the positive attributes associated with the ability to calculate credit costs, policymakers, academia, and financial institutions can concentrate on farmers lacking these attributes, providing them with tailored training and awareness initiatives to boost their financial skills, especially prior to taking a loan. Development programmes provided by aid agencies and state advisory services should encourage initiatives that focus on small farms since they tend to have poorer financial education including limited abilities to calculate credit costs.

Farmers with a higher need for credit seem to have lower proficiency in this area. Thus, financial literacy programmes targeted at farmers with high credit needs may help to make these farms more resilient. While the very fact of having a bank account might imply that a farmer possesses a certain level of financial literacy, it still seems likely that promoting financial inclusion and encouraging farmers to have bank accounts may have positive effects on farmers' calculating capabilities.

The inclusion of farmers into subsidy schemes also has indirect positive effects on their financial education and their capacity to involve more capital in their farming activities. Previous studies on Albania have already shown that government subsidy schemes have had a net positive impact on expanding the main supported agriculture activity and on part-time on-farm employment (Skreli *et al.*, 2015). Government and development agencies must therefore make more efforts to link grant provision with financial education services (in the shape of capacity building or training).

One of the limitations of the study is that cannot establish causality, such as the precise nature of the relation between having a bank account and financial literacy (or calculation capability). While it is rational to expect that having a bank account or being exposed to financial services may improve financial literacy, on the other hand, higher financial literacy can increase the likelihood of opening a bank account or using bank services. Future research, replicated across different countries and employing combined qualitative and quantitative methods, can offer deeper insights into causality.

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