# Determinants of Savings and Credit Cooperatives on Financial Intermediation

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***Authors’ contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

## ABSTRACT

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| The purpose of this research was to estimate the determinants of Saving and Credit Cooperatives on financial intermediation: a case study of Dalocha Woreda, Siltie Zone, Southern Ethiopia. A cross-sectional research design with a mixed research approach was used in the study. A multistage sampling technique was used to collect the required data from 264 cooperative members. A binary logistic model was used to estimate the determinants of saving and credit cooperatives on financial intermediation. The availability of defaulters, according to descriptive statistics, was the main challenge that hamper Saving and Credit cooperatives. According to the binary logistic result, the main determinants of Saving and Credit Cooperatives on financial intermediation in the study area were gender, education level, farm income, access to extension services, year of membership, distance, and livestock amount in Total livestock unit. Except for the distance to the cooperative, all significant factors have a positive impact on financial intermediation. As a result, the researcher suggests that appropriate interventions be implemented in the study area. |

*Keywords: Binary logistic model; challenges; financial intermediation; saving and credit cooperative.*

**1. INTRODUCTION**

According to [1] financial intermediation serves the following purposes: Pooling small savers' resources; many borrowers require large sums, while many savers offer small sums. Borrowers of large amounts of credit would be disadvantaged without intermediaries because they would incur enormous costs in searching for savers who would provide the required amount to be borrowed.

According to [2] financial intermediation is the process of obtaining indirect finance through the use of financial intermediaries. A financial intermediary accomplishes this by borrowing funds from lender-savers and then lending them to borrower-spenders. Without financial intermediaries, the modern world would not be as modern. Financial intermediation has earned savers' trust by safeguarding their assets and providing efficient asset management services. The pooling of savers' household savings enabled financial intermediaries to emerge as a single large lender capable of lending money to businesses and other borrowers.

Investment intermediaries, contractual savings institutions, and depository institutions such as banks and credit unions are all examples of financial intermediaries. According to [2] financial intermediaries can significantly reduce transaction costs, which are defined as the time and money spent performing financial transactions such as the exchange of assets, goods, or services. Credit provision is increasingly regarded as an important tool for increasing population income by redirecting resources to more productive uses Saving and Credit cooperatives are the most common financial intermediaries for credit unions.

Saving and credit cooperatives always sought to mobilize savings from middle and low-income groups while also providing credit to their members [3]. The core business of Saving and Credit cooperatives is to mobilise members' savings and provide them with credit at low-interest rates [4]. Saving and Credit cooperatives are likely to be the most viable and sustainable institutions for providing accessible and affordable financial services to the vast majority of low-income people [5]. Saving and Credit cooperatives Societies or Credit Unions were created to address the fundamental human need for a method of saving and borrowing without taking risks or giving too much power to a moneylender [6].

Previous studies in Saving and Credit cooperatives have attempted to identify the challenges that it faces. Abel et al. [7] discovered the problems of SACCOs in Ethiopia and other countries, but none of them demonstrated the challenges and determinants of saving and credit cooperatives on financial intermediation in combination and depth. Previous studies on the other hand, concentrated on the obstacles to saving and credit cooperative lending operations, and some on financial intermediation. The studies paid less attention to its growth and trends, and they didn’t use appropriate Econometrics analysis instead of narrating about the challenges and determinants of saving and Credit Cooperatives on financial intermediation; they are also confused. Furthermore, only limited research has been conducted in this topic in the study area .To fill these gaps, the study sought to investigate determinants of saving and Credit Cooperatives in Dalocha Woreda, Siltie Zone, Southern Ethiopia. The purpose of this article is evaluating the growth and trend of saving and credit cooperatives in the research area. Estimate the obstacles that prevent saving and credit operation of Saving and Credit cooperatives and to estimate the determinants of Saving and Credit cooperatives on financial intermediation in the study area.

**2. REVIEW OF RELATED LITERATURE**

**2.1 Financial Intermediation and Financial Intermediary**

The Business dictionary defines a financial intermediation as the process performed by bank and other financial institutions of taking in funds from depositors and then lending them out to a borrower. The banking business thrives based on the financial intermediation abilities of financial institutions that allow them to lend out money at a relatively high rate of interest while receiving money on deposit at relatively low rate of interest. A Financial intermediary is an institution which takes deposits or loans from individuals and lends money to clients [8]. According to [2] financial intermediaries are financial institutions that engage in financial asset transformation. They purchase one kind of financial asset from borrowers, generally, some kind of long-term loan contract whose terms are adapted to the specific circumstances of the borrower (e.g., a mortgage) and sell a different kind of financial asset to savers, generally some kind of relatively liquid claim against the financial intermediary (e.g., a deposit account). In addition, unlike brokers and dealers, financial intermediaries typically hold financial assets as part of an investment portfolio rather than inventory for resale [2]. According to [9] a financial intermediary is a financial institution that borrows from savers and lend to individuals or firms that need resources for investment.

**2.2 Role of Financial Intermediaries**

According to [2] financial intermediaries are so important in the financial markets due to their important role in transaction costs, risk sharing and information costs. [9] argues that financial intermediaries’ bears risk on behalf of investors by investing their savings across various sectors of business. They transform risk-by-risk spreading and risk pooling; they can spread risk across a range of institutions. In turn institutions can pool risk by spreading investment across firms and various projects. Diversification allows a financial intermediary to allocate assets and bear risk more efficiently. Financial intermediaries do risk screening, risk monitoring and risk evaluation. It is more efficient for institution to screen investment opportunity on behalf of individuals than for all individuals to screen the risk.

**2.3 Conceptual Framework of the Study**

The following conceptual framework gives a brief illustration about factors that determine the amount of saving deposited and credit received.

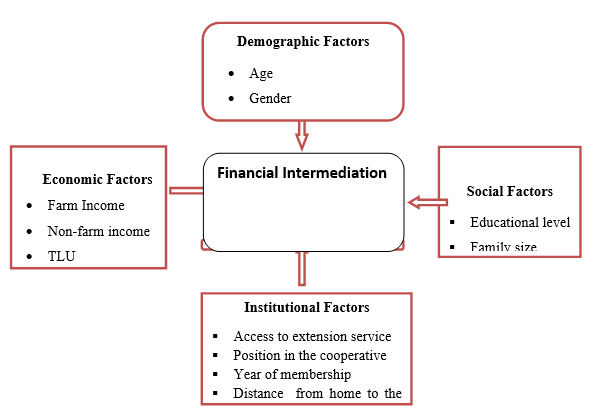
**3. RESEARCH METHODOLOGY**

**3.1 Method of Data Processing and Analysis**

The analysis techniques were performed in line with answering the research questions of the study. Accordingly, the background information of respondents and challenges were analyzed using descriptive statistics such as frequency, percentage, mean, standard deviation. Furthermore, t-test for continuous variables and chi-square for dummy variables were applied. In order to estimate the determinants of saving and Credit cooperatives on financial intermediation, binary logistic regression was used.

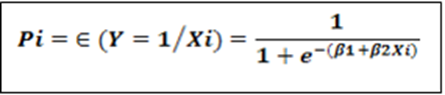
**3.2 Model Specification**

The researcher employed binary logistic regression which is a non-linear regression model specifically designed for binary response of a dependent variable system. The model was used to address the determinants of Saving and Credit cooperatives on financial intermediation through binary nature of the dependent variable that can be expressed as “Yes” or “No” responses using 1 and 0, respectively. In order to explain the model, the following logistic distribution function was used [10].

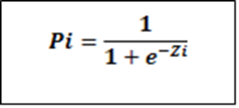


**Fig. 1. Conceptual framework showing a brief illustration about factors**

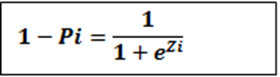
***Source****: Constructed by researcher from literature review, 20**21*

 (1)

In the logistic distribution, Pi is the dependent variable, X is the data; i, is the possibility of response by an individual (possibility of having 1 and 0 values by ith individual). When β1+β2Xi in equation 1 is obtained:

 (2)

Zi is between -∞ and +∞, and Pi is between 0 and 1. When Pi shows the possibility of saving and credit cooperative to play as financial intermediary, the possibility of saving and credit cooperative to not play as financial intermediary is 1-Pi [11]. Then the possibility of saving and credit cooperative has not play as financial intermediary can be explained as in equation three as follows:

 (3)

Equation 4 is obtained by dividing the possibility of saving and credit cooperative to play as financial intermediary by saving and credit cooperative has not play as financial intermediary as:

 (4)

When the natural logarithm of both sides of the equation is written, Equation 1 is obtained:

 (5)

When there are more than one independent variables (X1, X2 ...... XK), binary and logistic models was applied.

**Table 1. Explanatory variables used in the logit model**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Explanatory variable** | **Variable character** | **Expectation sign** |
| 1 | Gender | Dummy |  |
| 2 | Age | Continuous | ± |
| 3 | Educational level | Continuous | + |
| 4 | Family size | Continuous | + |
| 5 | Farm income | Continuous | + |
| 6 | Non- farm income | Continuous | + |
| 7 | Total livestock unit | Continuous | + |
| 8 | Access to extension service | Dummy | + |
| 9 | Position in the cooperative | Dummy | + |
| 10 | Years of member ship | Continuous | + |
| 11 | Distance from home to cooperative office | Continuous | ± |

**4. RESULTS AND DISCUSSION**

**4.1 Descriptive Statistics Results**

**Table 2. Mean comparison of continuous variables**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variables** | **Financial Intermediation** | | | | **t-test** | **p-value** |
| **No** | | **Yes** | |
| **Mean** | **SD** | **Mean** | **SD** |
| *Age of the respondent* | 37.03 | 6.171 | 35.26 | 5.956 | 2.33 | .021 |
| *Family size* | 4.83 | 2.105 | 4.31 | 2.084 | 1.978 | .049 |
| *Farm income* | 4.1815 | .19744 | 4.381 | .26986 | -6.508 | .000 |
| *Non-farm income* | .3461 | 1.07418 | .8114 | 1.53768 | -2.696 | .007 |
| *Year of membership* | 8.51 | 3.181 | 9.96 | 4.994 | -2.626 | .009 |
| *Distance* | 4.73 | 1.613 | 3.20 | 1.540 | 7.724 | .000 |
| *Tropical livestock unit* | 3.817 | 1.72419 | 4.597 | 2.83613 | -2.525 | .012 |

*Source: Computed from own survey, 2022*

On the basis of the respondent's age, Table 2 revealed a substantial difference between saving and credit cooperatives that act as financial intermediaries and those that do not. The independent samples t-test yielded a significant result (t = 2.33, p 0.05). This finding reveals that respondents' ages ranged considerably between those who said saving and credit cooperatives had a role in financial intermediation (Mean = 35.26) and those who said they didn't (Mean = 37.03). As a result, saving and credit cooperatives serve as a financial intermediation middleman for younger cooperative members as opposed to those of a more advanced age.

The results of table showed a significant difference between saving and credit cooperatives which play as financial intermediation and saving and credit cooperatives which did not play as financial intermediation based on the farm income. The result of the independent samples t-test was significant (t = -6.51, p< 0.00). This finding showed that respondents' mean perception of the farm income significantly differed between the saving and credit cooperatives play as a financial intermediation (Mean = 4.38) and saving and credit cooperatives did not play as a financial intermediation (Mean = 4.18). Thus, saving and credit cooperatives play as a financial intermediary for those who had higher income cooperative members than lower income.

The result of the independent samples t-test was significant (t = -2.70, p< 0.01). This finding suggests that respondents' mean perception of the nonfarm income significantly differed between the saving and credit cooperatives play as a financial intermediation (Mean = 0.81) and saving and credit cooperatives did not play as a financial intermediation (Mean = 0.35). Therefore, saving and credit cooperatives play as a financial intermediary for those who had higher nonfarm income cooperative members than lower nonfarm income.

The results of table showed a significant difference between saving and credit cooperatives play as a financial intermediation and saving and credit cooperatives did not play as a financial intermediation on the year of membership. The result of the independent samples t-test was significant (t = -2.63, p< 0.01). This finding suggests that respondents' mean perception of the year of membership significantly differed between the saving and credit cooperatives play as a financial intermediation (Mean = 9.96) and saving and credit cooperatives did not play as a financial intermediation (Mean = 8.51). Thus, saving and credit cooperatives play as a financial intermediary for those who had long years of cooperative membership than those who had less years of cooperative membership.

The results of the table showed a significant difference between saving and credit cooperatives play as a financial intermediation and saving and credit cooperatives did not play as a financial intermediation on the livestock amount. The result of the independent samples t-test was significant (t = -2.53, p< 0.05). This finding suggests that respondents' mean perception of the livestock amount significantly differed between the saving and credit cooperatives play as a financial intermediation (Mean = 4.60) and saving and credit cooperatives did not play as a financial intermediation (Mean = 3.82). Thus, saving and credit cooperatives play as a financial intermediary for those who had large livestock amount than those who had low livestock amount.

**4.2 Descriptive Statistics Results for Categorical Variables**

**Table 3. Sex of respondents and financial intermediation**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sex** | **Financial Intermediation** | | | | **Total** | |  | **p-value** |
| **No** | | **Yes** | |
|  | **%** |  | **%** |  | **%** |
| Female | 10 | 9.5 | 36 | 22.6 | 46 | 17.4 | 7.563 | .006 |
| Male | 95 | 90.5 | 123 | 77.4 | 218 | 82.6 |
| Total | 105 | 100 | 159 | 100 | 264 | 100 |

*Source: Computed from own survey, 2022*

The results of Table 3 showed that among female saving and credit cooperative members more female (22.6%) has got financial intermediation from saving and credit cooperatives than those female who did not get financial intermediation (9.5%). On the other hand, among male saving and credit cooperative members, more male (90.5%) did not get financial intermediation from saving and credit cooperative than those male who get financial intermediation (77.4%). The Chi-square analysis (=7.56, p< 0.01) revealed that there is statistically significant relationship between sex and financial intermediation of the respondents. The result implied that female respondents had a better chance to get financial intermediation from saving and credit cooperative than male respondents in the study area.

As shown in Table 4, among the total saving and credit cooperative members who has got financial intermediation from SACCOs, 48.4% of them attended secondary school (Grade 9-12) whereas, among the total saving and credit cooperative members who did not got financial intermediation from SACCOs, 48.6% of them did not attend formal education. The *Chi*-square analysis (=15.14, p< 0.01) revealed that there is statistically significant relationship between education level and financial intermediation of the respondents. The result implied that saving and credit cooperatives play as a financial intermediation for cooperative members who had better education level in the study area.

According to Table 5, among the total saving and credit cooperative members who has got financial intermediation from SACCOs, 86.8% of them have access to extension service whereas, among the total saving and credit cooperative members who did not got financial intermediation from SACCOs, 77.1% of them has access to extension service. The *Chi*-square analysis (=4.16, p< 0.05) revealed that there is statistically significant relationship between access to extension service and financial intermediation of the respondents. The result implied that saving and credit cooperatives play as a financial intermediation for those who had access to extension service than did not have access to extension service respondents in the study area.

**Table 4. Education level and financial intermediation**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Education level** | **Financial Intermediation** | | | | **Total** | |  | **p-value** |
| **No** | | **Yes** | |
|  | **%** |  | **%** |  | **%** |
| No education | 51 | 48.6 | 38 | 23.9 | 89 | 33.7 | 36.173 | .000 |
| Primary (Grade 1-8) | 40 | 38.1 | 44 | 27.7 | 84 | 31.8 |
| Secondary (Grade 9- 12) | 14 | 13.3 | 77 | 48.4 | 91 | 34.5 |
| Total | 105 | 100 | 159 | 100 | 264 | 100 |

*Source: Computed from own survey, 2022*

**Table 5. Access to extension service and financial intermediation**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Access to extension service** | **Financial Intermediation** | | | | **Total** | |  | **p-value** |
| **No** | | **Yes** | |
|  | **%** |  | **%** |  | **%** |
| No | 24 | 22.9 | 21 | 13.2 | 45 | 17.0 | 4.164 | .041 |
| Yes | 81 | 77.1 | 138 | 86.8 | 219 | 83.0 |
| Total | 105 | 100 | 159 | 100 | 264 | 100 |

*Source: Computed from own survey, 2021*

**Table 6. Position in the cooperative and financial intermediation**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Position in the cooperative** | **Financial Intermediation** | | | | **Total** | |  | **p-value** |
| **No** | | **Yes** | |
|  | **%** |  | **%** |  | **%** |
| Leader | 29 | 27.6 | 25 | 15.7 | 54 | 20.5 | 5.50 | .019 |
| Member | 76 | 72.4 | 134 | 84.3 | 210 | 79.5 |
| Total | 105 | 100 | 159 | 100 | 264 | 100 |

*Source: Computed from own survey, 2021*

**Table 7. Results of binary logistic regression model**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Variables** | **Β** | **S.E** | **Wald** | **p-Value** | **Exp(B)** |
| Sex of respondent\*\*\* | 1.739 | .623 | 7.794 | .005 | 5.691 |
| Age of Respondent | -.057 | .039 | 2.127 | .145 | .945 |
| Educational Level\*\*\* | 1.614 | .338 | 22.777 | .000 | 5.023 |
| Family size | -.297 | .158 | 3.541 | .060 | .743 |
| Farm income\*\*\* | 5.249 | 1.173 | 20.028 | .000 | 190.33 |
| Nonfarm income | .309 | .175 | 3.114 | .078 | 1.362 |
| Access to extension service\*\*\* | 2.232 | .588 | 14.397 | .000 | 9.322 |
| Position in the cooperative | .490 | .473 | 1.073 | .300 | 1.632 |
| Year of membership | .147 | .071 | 4.227 | .040 | 1.158 |
| Distance\*\*\* | -.604 | .136 | 19.650 | .000 | .547 |
| Tropical livestock unit\*\* | .209 | .093 | 5.069 | .024 | 1.232 |
| Constant | -26.129 | 5.752 | 20.636 | .000 | .000 |
| Number of observation | 264 |  |  |  |  |
| LR *Chi*2*(11)* | 166.21 |  |  |  |  |
| Prob>*Chi*2 | 0.000 |  |  |  |  |
| Pseudo R2 | 0.4684 |  |  |  |  |

***Note:*** *Note: \*\*\*and \*\* implies statistical significance at 1%and 5% levels, respectively; Source: Computed from own survey, 2022*

As it can be seen from Table 6, among the total saving and credit cooperative members who has got financial intermediation from SACCOs, 84.3% of them were member in the cooperative whereas, among the total saving and credit cooperative members who did not got financial intermediation from SACCOs, 72.4% of them were member. The Chi-square analysis (=5.50, p< 0.05) revealed that there is a statistically significant relationship between position in the cooperative and financial intermediation of the respondents. The result implied that saving and credit cooperatives play as a financial intermediation for cooperative members than leader respondents in the study area.

**4.3 Determinants of SACCO on Financial Intermediation**

Under this topic, determinants of saving and credit cooperatives on financial intermediation were analyzed using binary logistic regression. The results are presented in Table 7. Before applying regression analysis to test the determinants of saving and credit cooperatives on financial intermediation, multicollinearity tests are made to identify misspecification of data if any to fulfill research quality and there is no violation of the assumptions.

According to binary logistic regression output, out of eleven variables included in the model, seven predictors significantly affected financial intermediation. The significant variables that influence the financial intermediation of respondents in the study area were sex, education level, farm income, access to extension service, year of membership, distance, and livestock amount in TLU. Thus, the following few paragraphs describe only these significant variables.

**Sex:** According to the results of Table 7, sex has a positive and statistically significant effect on financial intermediation (B =1.74, p <0.01). The odd of respondents who were female has got a financial intermediation service from saving and credit coperatives is 5.69 times higher than those respondents who were male.

**Education level:** According to the results of table, education level has positive and statistically significant effect on financial intermediation (B =1.61, p <0.00). The odds of respondents who had higer education level has got a financial intermediation service from saving and credit coperatives is 5.02 times higher than those respondents who had lower education level. This revealed that sampled respondents who had higer education level have better chance to be saving and credit cooperatives play as a financial intermediation than had lower education levelsaving and credit cooperative members.

**Farm income:** The farm income of the sampled cooperative members has a positive and statistically significant effect on the financial intermediation(B = 5.25, p <0.00). It can be inferred from the values of odds ratio that if the farm income of a sampled cooperative members increased by one unit, a household head has a 190.33 chance to get financial intermediation service from saving and credit cooperatives regardless of other independent variables in the model. This indicated that farm income has a positive effect on financial intermediation. This finding matches with finding of Adane and enyew (2018).

**Acess to extension service:** According to the result in Table 7 , acess to extension service has positive and statistically significant effect on financial intermediation (B =2.23, p <0.00).The odds of respondents who had acess to extension service has got a financial intermediation service from saving and credit coperatives is 9.32 times higher than those respondents who had no acess to extension service. This revealed that sampled respondents who had acess to extension service have better chance to be saving and credit cooperatives play as a financial intermediation than had no acess to extension servicesaving and credit cooperative members.

**Year of membership:** The year of membership of the sampled cooperative members has a positive and statistically significant effect on the financial intermediation(B = 0.15, p <0.05). It can be inferred from the values of odds ratio that if the year of membership of a sampled cooperative members increased by one unit, a household head has a 1.16 chance to get financial intermediation service from saving and credit cooperatives regardless of other independent variables in the model.

**Distance to the cooperative:** The distance to the cooperative of the sampled cooperative members has a negative and statistically significant effect on the financial intermediation(B = -0.60, p <0.00). It can be inferred from the values of odds ratio that if the distance to the cooperative of a sampled cooperative members increased by one unit, a household head has a lower chance of 0.55 unit to get financial intermediation service from saving and credit cooperatives regardless of other independent variables in the model.

**Livestock amount:** The livestock amount of the sampled cooperative members has a positive and statistically significant effect on the financial intermediation (B = 0.21, p <0.05). It can be inferred from the values of odds ratio that if the livestock amount of a sampled cooperative members increased by one unit, a household head has a 1.23 chance to get financial intermediation service from saving and credit cooperatives regardless of other independent variables in the model. This indicated that livestock amount has a positive effect on financial intermediation.

**5. CONCLUSION AND RECOMMENDA-TIONS**

Female SACCOs members have a better chance of getting financial intermediation from cooperatives than malesaving and credit cooperative members. Likewise, cooperative members who had higher education levels have a better chance of getting financial intermediation support than other cooperative members who had lower education levels. Similarly, farm income and livestock amount have a positive effect on financial intermediation. Correspondingly, cooperative members who had access to extension service have a better chance to get financial intermediation from SACCOs than other SACCO members who had no access to extension service. Equally, cooperative members who had large years of membership have a better chance to get financial intermediation from SACCOs than other SACCO members who had low membership duration. On the other hand, distance to the cooperative has a negative effect on financial intermediation.

The main challenge that hinders the saving and lending operations of SACCOs was the availability of defaulters. A greater number of sampled respondents agreed that the number of defaulters increases from time to time in the saving and Credit Cooperatives. This is due to the fact that saving and credit cooperatives have a limit of collateral to give a credit. Thus, an adequate witness is a must to take credit.

Based on the main finding of the study the flowing recommendations are forwarded Male members of saving and credit cooperatives should be encouraged more because only female members have a better chance of receiving financial intermediation from cooperatives than male members of saving and credit cooperatives. Furthermore, credit and saving Cooperatives should provide training to members, particularly those with lower education levels, and should also create some additional opportunities for those with higher education levels to receive financial intermediation support than other cooperative members.

As a result, savings and credit cooperatives should help other cooperative members with low farm income and livestock amounts. Members of savings and credit cooperatives should be encouraged to gain access to extension services as well, because sampled respondents who have access to extension services have a higher chance of obtaining financial intermediation.

Saving and credit cooperatives should encourage members who have a short membership history and live far from the office. Finally, low repayment performance of members of saving and credit cooperatives is a challenge that impedes saving and lending operations in the study area.

To ensure the continuity of its lending operations, saving and credit cooperatives should know about their members and their witnesses before distributing credit.

Competing interests

Authors have declared that no competing interests exist.

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