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FORMAL CREDIT INCLUSION WITHIN ONE-COMMUNE-ONE-PRODUCT PROGRAM (OCOP) IN THE AGRICULTURAL RESTRUCTURING STRATEGY OF NORTHWESTERN VIETNAM

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ABSTRACT. Considering international experience, Vietnam has carried out the One Commune One Product program (OCOP) to produce specialty farm products and improve income for farmers. However, success of such programs depends heavily on relaxing credit access constraints for primary OCOP producers to be able to fulfil their investment. This paper applies a logit regression and data collected from face-to-face interviews with 482 farm households and relevant stakeholders in Northwestern Vietnam to explain the existence of credit gap between credit demand and supply. The results show that credit access constraints are quite common for cinnamon and bamboo farm households. The amounts of credit provided satisfied only part of households' credit demand. Lack of valuable collateral in the form of residential houses and other fixed assets is the main factor explaining the shortage of bank credits. In addition, the proportion of farm households with bank accounts remains to be low, while convenient access to bank accounts improves household economy and facilitates access to bank credit. Redesigning the "one size fits all" bank credit policy is needed to be suitable for different OCOP programs. Moreover, promoting multiparty cooperation between banks and other actors can be a sustainable direction in connecting agricultural credit supply and demand.

1. Introduction

Farming sector is crucial for any level of economy as it provides food needed to feed the rising number of population in the world. In the context of climate change and decreasing areas of viable farm lands, the question of increasing farming efficiency is a strong concern for policy-makers. In an attempt to add value to farming products and increase farming

productivity, several countries have restructured the farming sector to increase efficiency and offer high-quality farm products (Haraguchi, 2008). For example, Korea has implemented the Samunel Undong to develop its rural economy. Japan and Thailand applied the economic theory of product differentiation to carry out the One Village One Product (OVOP) programme which aims to increase value and income for farmers (Natsuda et al., 2012). Considering successful experiences of these countries, Vietnamese government has launched the program titled "One Commune One Product" (OCOP) which aims to standardize about 2,400 farm products by 2020 based on national certified standards. The strategy is to restructure the agricultural sector, which serves as an important source of income and livelihood sustainability for about 65% of the total population and 50% of the labour force.

International experiences show that access to credit is crucial in helping OCOP producers to adopt new technologies, deal with unexpected risks, and enhance cooperation with enterprises in the value chain to overcome the disadvantages from being small-scale (Anang et al., 2016; Chakrabarty, 2011; Ciaian & Kancs, 2011; Li, 2018). Particularly, credit is necessary to expand food production to fulfil the demand of the rising global population (Oberholster et al., 2015). While credit inclusion or the delivery of credit services to farmers at affordable terms has the major role in agricultural restructuring, limited access to credit hinders farm investment and productivity in Vietnam (Iqbal & Sami, 2017; Luan & Bauer, 2016). Lack of access to credit is therefore a big challenge in moving the OCOP program forward and linking producers to bank loans.

The amount of literature recognizing the importance of rural credit in Vietnam has grown significantly in the recent years. For example, Cuong (2008), Hao and Mullineux (2007) showed that access to credit has a positive impact on poverty reduction in Vietnam. However, the authors also indicated that the success of credit schemes is highly dependent on specific regional contexts. In spite of a significantly growing volume of literature recognizing the importance of household access to credit, previous studies insufficiently discuss the determinants of access to credit by primary OCOP producers. This paper contributes to literature by examining demand and access constraints to formal credit by OCOP farm households.

2. Theoretical framework

The theoretical framework in this study is depicted in Figure 1. For successful OCOP programs, the starting points to be considered are external pressure and incentives set by market forces. Customers who buy final OCOP products are of great importance, as they decide the existence of the products on markets. Revenues from selling OCOP products help farmers to reinvest in farming activities. In addition, governmental intervention from local communes, districts, national governments is of great relevance in facilitating access to financial resources. The aforementioned pressures in the form of criteria will be passed through farmers, the primary OCOP producers. In response to stresses, farmers need financial incentives to make intensive investments to improve the quality of farm products. Accordingly, the removal of access constraints to credit and bridging the credit gap is crucial to the success of OCOP programs. This study limits its scope of analysis of access to credit at the farm household level.

Determining the main factors that affect credit access for farm households plays an important role in designing credit schemes. Previous studies have shown that access to credit at household level depends heavily on both farmers and household characteristics. For example, Zeller and Sharma (2002) identified farm size as an important determinant of accessing both formal and informal credit. The distance of the household to the commune centre is used to capture the access to information and transaction costs of households. It is

expected that a greater distance hinders household social communication and increases transaction costs, which are expected to decrease the probability of credit access and repayment (Khoi et al., 2013; Stanton, 2002). Membership in local women's unions might improve household social networks, which improves women's empowerment, mobility, and social interactions at the community level as well (Pitt et al., 2006). A contribution of Dufhues et al. (2011) added to our understanding of the effects of social capital measured by household membership in social organizations on the loan repayment behaviour of borrowers in Vietnam. Moreover, the level and frequency of access to agricultural extension services such as information support, input supply, and training help farmers manage and use resources more effectively (Buadi et al., 2013). At the same time, maintaining relationships with agricultural extension stations can also improve household social capital. In return, social capital is very useful in providing information about credit programs to potential borrowers and reducing the cost of searching (Okten & Osili, 2004). Education and training experiences of borrowers are positively associated with a farmer's profits and ability to repay (Brehanu & Fufa, 2008). In another study, Grohmann et al. (2018) showed that access to credit is highly dependent on the financial literacy of households. A household's endowments such as age, ethnicity and education of household heads, household size and labors, access to markets, bank accounts, trainings, membership in farmer-based unions, and collateral are important in determining its access to credit (Baiyegunhi & Fraser, 2014; E. Saqib et al., 2018; Luan & Anh, 2015; Oluwasola & Alimi, 2008). To facilitate access to credit, there is a need for credit policy to address the real issues of farmers instead of applying a homogeneous policy to all farmers (Bai et al., 2018).
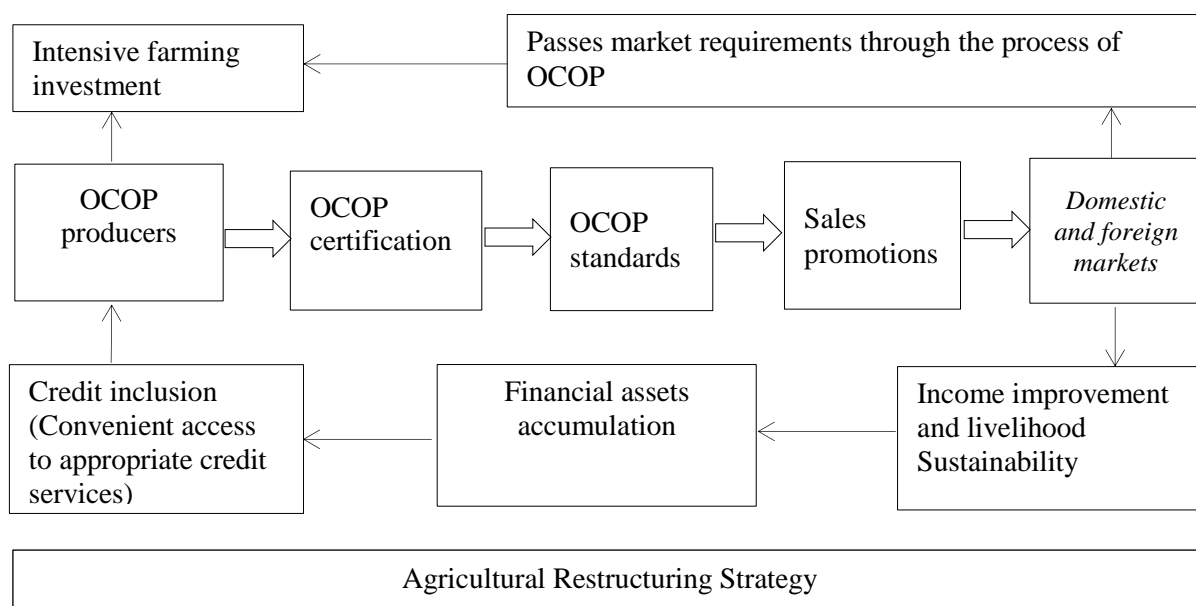

Figure 1. Conceptual framework of the study
Source: Own construction.

Khoi et al. (2013) found that convenient access to village roads improves household access to formal loans in the Mekong River Delta of Vietnam. Better road connection can reduce transaction costs of accessing credit. Households with a higher number of dependents are considered to be less able to improve their living standard and hence, less creditworthy. In Vietnam, ethnic minorities account for only 14.5% of the total population, but they make up 50% of the poor (World Bank, 2009). Ethnic minorities can have better access to subsidized

credit programs (Armendáriz & Morduch, 2010). Among household endowments, a number of helpers, number of contacts with agricultural extension, the age of household heads, ethnicity, family size, savings, and exposure to shocks emerged as reliable predictors of credit access (Luan & Bauer, 2016). According to Agyekumhene et al. (2018), mistrust and insufficient information between banks and applicants can cause problems and prevent households from accessing credit. Therefore, the authors suggest adapting digital platforms for trust building in credit provision.

3. Methodological approach

3.1. Data collection

The present study selected two districts where a majority of ethnic minorities live and rely on farming activities to sustain their livelihood in Yen Bai province to collect primary data. These two districts are well known for farming, especially bamboo and cinnamon products. The local government considers those two suitable products for the OCOP programs. Cinnamon, a medicinal plant, has been grown in Van Yen a long time with more than 40,000 hectares, contributing 70% of the province's total output. In 2011, cinnamon was granted geographical indication protection by the National Office of Intellectual Property of the Ministry of Science and Technology. Cinnamon trees provide different types of products for domestic and foreign markets such as Japan, China, Sri Lanka, and India. Cinnamon products such as bark, branches, tops, and leaves can be used as an alternative medicine for treatment and prevention of diseases. Cinnamon trunks are used for making traditional handicraft wood products and for housing and paper materials. Every year, the district produces around 7,000 tons of all kinds of dried cinnamon bark and other products with total revenue of hundreds of VND billions, contributing to poverty reduction as well as environmental protection. Bamboo shoots, a type of special fresh vegetable, have been grown in Luc Yen district with a current area of about 50 hectares to meet both domestic demand and exports to Japan and Taiwan. Both bamboo shoots and cinnamon share some common features which are also the main criteria applied in certifying OCOP products: (1) Close to the traditional farming culture of ethnic minorities such as Dao, Nung, and Tay ethnic minorities; (2) Known as specialty products using local materials and very relevant to the community development; (3) Benefit not only for economic development but also environmental protection, an important criterion in sustainable development; (4) Both products were identified as potential OCOP products and received strong consideration from local governments to develop the rural economy and reduce poverty.

To collect primary data, the study conducted face-to-face interviews using structured questionnaires with 319 cinnamon households in Van Yen and 163 Bat Do bamboo households in Luc Yen during the period between August and December 2017. The main contents of the interviews covered issues as follows:

- Household demographics; participation in the value chain.
- Ascertain the linkages between farmers and other actors in the value chain.
- Farming methods, production, inputs, sales outlets, and income.
- Household access to credit and banking accounts.
- Advantages, disadvantages, and recommendation of farmers to policymakers.

Such information is useful to understand factors that might affect access to credit and willingness to lend, lending conditions, debt risks management, and other credit transactions activities in study areas. Additional primary data was collected through in-depth interviews with relevant stakeholders such as bank managers, governmental agencies, heads of

agricultural extension stations and enterprises. Household sample size and decomposition of sample size are presented in Table 1.

Table 1. Decomposition of household sample size

Households	Districts	Communes	Sample size (households)	Sampling rate (%)
Cinnamon	Van Yen	Dai Son	73	22.88
		Vien Son	68	21.32
		Mo Vang	30	9.40
		Chau Que Ha	25	7.83
		Yen Phu	30	9.40
		Phong Du Thuong	25	7.83
		Xuan Tam	26	8.15
		Tan Hop	42	13.19
		Sub-total	*319*	*100*
Bamboo	Luc Yen	Minh Tien	60	36.81
		Dong Quan	63	38.65
		An Phu	40	24.54
		Sub-total	*163*	*100*

Source: Author's calculation based on the household survey 2017.

Table 2. Definition of variables used in the study

Dimension	Variable codes	Type	Definition
Farmers	HAGE	C	Age of the household head, measured by taking the year 2017 deducted the year of birth of the household head (years)
	HEDU	C	Education of the household head measured by the number of years in school (years)
	ETHI	D	The ethnicity of the household head (=1 if the household head is the majority group; 0 otherwise ethnic minorities)
Households	HLABO	C	Number of labours who are in working age and able to generate income for households (labours)
	HSIZE	C	Total number of family members (persons)
	MADIS	C	The distance in km from the house to the nearest market
	MVSIT	C	The frequency of market visits per week (visits)
	BACOU	D	Ownership of a bank account (=1 if the household has a bank account and 0 otherwise)
	FSIZE	C	Total farm size (ha)
	OGANI	D	The holder of an organic cinnamon certificate (=1 if the household has the certificate; 0 otherwise)
	COLAT	D	If the loan needs to secured by a red book certificate (1=Yes, 0 otherwise)
	TRAIN	D	A dummy that equals one if the farmer attended a training course (e.g bookkeeping, technical assistance, post-harvest facilities; entrepreneurship, market linkage
	UNION	D	Membership status of local unions (=1 if the household has at least one person who is a member of a women's union or a farmers' union; 0 otherwise)
	INCOM	C	Total family income measured in millions of VND dong per month
	FICOM	C	Total family farm income measured in millions of VND dong per month
	NICOM	C	Total family non-farm income measured in millions of VND dong per month
	SOCOP	C	The income share of OCOP products in total family income per month (%)
	LIKAG	D	Dummy =1 if traders/firms allowed prepayment to the farmers and 0 otherwise.

Source: own specification.
Note: D= discontinuous variables; *C*= Continuous variables.

Based on literature reviews and consultants from local governmental officials, the study selected variables included in an econometric model (Table 2). In Vietnamese culture, the household head is the representative of a family in the decision-making process. Therefore, the survey covers the characteristics of household heads such as age, ethnicity, and education, which are included in the logit model. The education level of the household heads can influence resource use efficiency and is related to the ability to understand farming and resource management.

3.2. Analysis of determinants of access to credit

In the present study, the logit model connects the status of access to credit to a set of farmers and households' characteristics. In general, the ideal of probability models is written as follows:

$$Prob(even\ j\ occurs) = Prob(Y = j) = F[relevant\ effects, parameters].$$

In the present research, the dependent variable Y takes a value equal to 1 if the households received credit and Y=0 otherwise. Considering households' endowments in vector X that explains credit access status of households, so that:

$$Prof\big((Y = 1|X)\big) = F(X'\beta);$$

$$Prof\big((Y = 0|X)\big) = 1 - F(X'\beta).$$

The set of parameters, β, reflects the impact of the changes on X on the probability of the dependent variable. The logistic distribution has been used in many analyses giving rise to the logit model.

$$Prob(Y = 1|X) = \frac{e^{X'\beta}}{1 + e^{X'\beta}} = \Lambda(X'\beta).$$

The notation, $\Lambda(.)$, is used to indicate the logistic cumulative distribution function. The maximum likelihood estimation is used to estimate the logit model. The LF function is a function of the parameter, β , since X is known and is written as:

$$f(Y_1, Y_2, \dots, Y_n) = \prod_1^n f_i(Y_i) = \prod_1^n P_i^{Y_i} (1 - P_i)^{1-Y_i}\ (*),$$

where: *n* is the number of observations; (Y_i) denote the probability that Y_i=1 or 0, $f(Y_1, Y_2, \dots, Y_n)$ is the joint probability of observing the Y value.

Suppose the expected benefit from loan use is EX_i^* and the actual access to credit of the ith household is denoted by CA_i which is equal to 1 if the household gets a loan within the past 24 months and equal to 0 otherwise. This relationship is described through the following model:

$$CA_i = \begin{cases} 1, if\ EX_i^* = \beta_i X_i + \varepsilon_i > 0 \\ 0, if\ EX_i^* = \beta_i X_i + \varepsilon_i < 0 \end{cases}$$

EX_i^* is not actually observed but only the actual borrowing of households is observed. β is the parameter vector k x₁ to be estimated by the model. X_i is a set of explanatory variables, representing household resources and may affect household credit access; ε_i is the error term from model estimation. Because the dependent variable is a binary variable, the model is estimated by the maximum reasonable estimation method MLE- Maximum-Likelihood Estimation (Norton & Dowd, 2018).

4. Conducting research and results

4.1. Main characteristics of surveyed households

Table 3 presents the characteristics of households in the sample. Household samples with secondary and graduate levels indicate that the farming sector is mostly occupied with the primary educational level. The shares of ethnic minorities in the two districts are different. The Nung people, making up 63% of total respondents, are an ethnic minority at the national level but are the majority in Luc Yen district. In Van Yen district, the Kinh people are considered to be the ethnic majority, making up 28% of total respondents. On average, bamboo households had about 0.34 harvest hectares while cinnamon households had 2.73 hectares.

Table 3. Demographic and socioeconomic characteristics of sampled cinnamon households

Dimension	Variable	Bamboo households (n=163)		Cinnamon households (n=319)	
		Mean	Standard errors	Mean	Standard errors
Farmers	HAGE	47.18	11.51	44.75	10.85
	HEDU	6.77	3.734	6.16	3.99
	ETHI	.63	.48	.28	.45
Households	UNION	.41	.49	.23	.42
	HSIZE	4.85	1.57	4.65	1.57
	HLABO	2.82	1.18	2.64	1.12
	MADIS	7.01	5.35	5.74	5.69
	MVSIT	1.26	.64	1.74	1.34
	FSIZE	.34	.33	2.73	3.36
	COLAT	.21	.41	.17	.37
	BACOU	.03	.19	.09	.29
	TRAIN	.19	.39	.14	.35
	INCOM	9.70	4.26	6.13	4.51
	FICOM	4.41	2.56	3.77	3.41
	NICOM	5.29	3.95	2.25	3.50
	SOCOP	21.57	18.60	66.93	27.22

Source: Author's calculation based on the household survey 2017.

International experiences showed that ownership of a bank account is positively associated with savings accumulation and financial literacy and poverty reduction (Li, 2018; Sen & De, 2018). However, in the sample, the share of households surveyed with a bank account remains low, with 3% in the case of bamboo households and 9% in the case of cinnamon households compared to 20.67% of rural adults with bank accounts nationwide. Although Elahi et al. (2018) showed that agricultural training services can reduce access barriers to credit and improve farming efficiency, only 19% and 14% of bamboo and cinnamon households respectively had received training courses regarding cultivation, harvest and primary processing techniques. The distance to the nearest market is relevant to transport costs, information gaps, and product sales. On average, cinnamon farmers could access the nearest market within a radius of 5.74 kilometres, while bamboo households in Luc Yen district had to travel nearly 5.74 kilometres to access the nearest market. Local unions such as women's and farmers' unions are important channels for addressing the problems of information asymmetry and facilitating social networks in credit transactions information. The share of households with memberships in local unions is quite high in the case of bamboo households (41%) compared to cinnamon households (23%).

4.2. Credit sources and main characteristics

As can be seen in Table 4, the percentage of farm families who received formal credit in the last 24 months was 54% in the case of bamboo households and 48% in the case of cinnamon ones. Although farm families reported that access to credit is easier today, around 24-28% of farmers cannot access credit due to problems such as lack of collateral, fear of debt, complicated procedures and unawareness of effective credit use. In the study area, both formal and informal credit is available at various interest rates depending on the source.

Table 4. Main characteristics of loans received by households

Households	Characteristics of loans	Measurement units	Formal credit sources		
			Vietnam Bank for Agriculture and Rural Development	Vietnam Bank for Social Policy	Overall
Bamboo	Duration	Years	3.21	4.59	4.02
	Monthly interest	%	.82	.61	.70
	Collateral	% of loans	.89	.00	.37
	Demand for credit	% of households	NA	NA	.77
	Received credit	% of households	.22	.32	.54
Cinnamon	Duration	Years	3.51	3.87	3.58
	Monthly interest	%	.84	.66	.72
	Collateral	% of loans	.74	.00	.34
	Demand for credit	% of households	NA	NA	.76
	Received credit	% of households	.15	.32	.47

Author's calculation based on the household survey 2017.
Note: NA: No data available.

The Vietnam Bank for Social Policy (VBSP) and Vietnam Bank for Agriculture and Rural Development (Agribank) are two formal credit sources in the study area. A majority of loans from Agribank are secured by collateral in the form of land use certificates, while free-collateral loans from VBSP are subsidized by the government. In both districts, VBSP is the main credit lender, particular for those who are ethnic minorities and lower-income households. Credit lines are available to cinnamon households for hiring labours to harvest cinnamon products, primary processing of cinnamon bark (drying) and storage to make them ready to be sold to collectors. Post-harvest appears to be the main reason for credit demand by cinnamon households. On the other hand, farmers in Luc Yen used credit to purchase fertilizers and clearance for bamboo gardens. The VBSP has some common shares in the formal credit supply in both districts.

4.3. The gap between credit demand and supply

Table 5 presents the extent to which loan amount received fulfils the credit demand by OCOP households. Considering all credit sources, credit volumes received are around 19.99% to 36.81% lower compared to the amount of credit applied for by the farmers. This data suggests the existence of credit rationing, resulting in the gap between the demand for and supply of formal credit. The lending policy of the banks applied to determine the amount of credit disbursed to households is the main explanation for the inadequate amount of credit received by households. VBSP offered no more than 50 million VND due to the limited

budget of subsidies by the government. Agribank lent in amounts no greater than 70% the value of the collateral asset. Agribank relies on collateral to mitigate the lending risks and recover the amount disbursed. Both banks in both districts applied the same lending policies, which are regulated primarily by the headquarter boards at the national level. A one-size-fits-all credit policy was applied in this case. It is recognized that liquidity constraints in OCOP households remain a hindrance to intensive farming to fulfil the requirement of OCOP standards.

Table 5. The extent of fulfilling credit demand by farm households

Households	Credit sources	Sample size	Credit gap			
			Volume received (VND millions)	Volume demanded (VND millions)	Credit Gap (VND millions)	Satisfactory extent (%)
			(1)	(2)	(3)=(2)-(1)	(4)=[(1)/(2)]*100
Cinnamon	Agribank	47	80.97	98.53	17.56	82.18
	VBSP	103	32.16	41.81	9.65	76.92
	Overall	154	47.42	59.27	11.85	80.01
Bamboo	Agribank	37	53.86	69.32	15.46	77.69
	VBSP	52	32.46	63.61	31.15	51.03
	Overall	87	41.35	65.43	24.08	63.19

Source: Author's calculation based on the household survey 2017.

4.4. Reasons for explaining non-credit farmers

An attempt was made to investigate the farmers who did not receive credit during the last 24 months. The reasons for not applying for credit by this group of farmers are presented in Fig. 2. About 30.27% and 41.82% of bamboo households and cinnamon households respectively had no need for credit. This factor is derived from the fact that farmers who are able to finance their activities from their own income have no need for credit from external sources or simply discouraged by the lending policies. About 39% and 27% of cinnamon households and bamboo households have access problems in formal financial credit due to various reasons, such as lack of collateral, fear of complicated procedures, and lack of knowledge to use credit effectively.
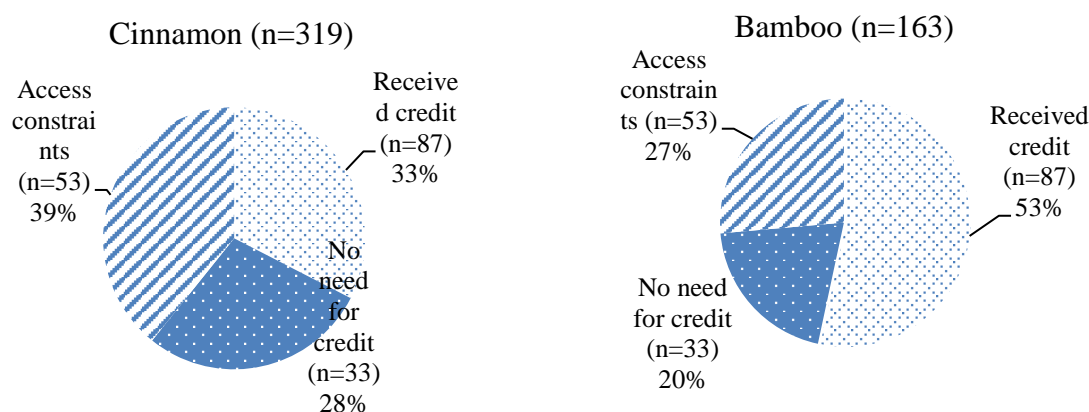

Figure 2. Reasons for not receiving credit by surveyed households

Source: Author's calculation based on the household survey 2017.

Elaborate security and tangible collateral are required as prerequisites, according to the lending policies of the Agribank. The complicated application requirements also raise the cost of getting credit for farmers. Also, the lack of knowledge on how to use credit effectively reflects the limited knowledge and skills of cultivation, trading, and business.

4.5. Determinants of access to commercial credit

The result of the logistic regression is presented in Table 6. It provides the driving force that motivated the OCOP household to access Agribank credit. The dependent variable is binary, taking the value of 1 if the household accessed credit and zero otherwise. The various test of goodness-of-fit indicates that the selected covariates provide good estimates to use model. For example, LR chi2(11) test statistics indicate that explanatory variables are jointly statistically significant ($p<0.01$).

Table 6. Determinants of credit access constraints to Agribank credit

Variables	Bamboo			Cinnamon		
	Coefficient	Standard Error	Z statistics	Coefficient	Standard Error	Z statistics
Intercept	−13.61745**	5.56273	−2.45	−2.20230	1.40417	−1.57
AGE	.11559	.06877	1.68	−.00193	.02345	−0.08
EDU	.57433**	.24778	2.32	.01036	.06398	0.16
ETHNI	.00638	1.29356	0.01	.26858	.47821	0.56
HLABO	−.36711	.58198	−0.63	−.24139	.23083	−1.05
MADIS	−.13621	.12910	−1.06	−.15189**	.06852	−2.22
MVISIT	.16378	.76834	0.21	.04910	.15803	0.31
BACOU	3.66984	1.97700	1.86	1.01751	.68465	1.49
FSIZE	.99002	1.51879	0.65	.05200	.07626	0.68
COLAT	8.69956***	2.06166	4.22	3.87540***	.46296	8.37
TRAIN	.91720	1.18179	0.78	−.36806	.61649	−0.60
UNION	.16674	1.19619	0.14	.22969	.50396	0.46
Number of observations	163			319		
LR chi2(11)	142.23			113.31		
Prob > χ2	.00000			.00000		
Pseudo R2	.81450			.42480		
Correctly classified (%)	95.71			92.16		

Source: Author's regression using Stata 12.0 and survey data.
Note: *** significant at 1%; ** significant at 5%.

Variables such as age, education, and ethnicity of household heads are included to cover the characteristics of the household heads responsible for economic decision-making. Among those variables, only the education level of the household heads is positively correlated with households' access to credit. This finding is strongly confirmed in the case of bamboo households as the estimated coefficient of the variable EDU is statistically significant at $p<0.01$. Agribank normally asked applicants to show the feasible and effective credit use proposal to make the lending decision. The more educated the household head is, the better the credit use plan is prepared.

Among the variables used to capture household information, the coefficients of the two variables representing the distance to the nearest market and collateral security are statistically significant at $p<0.01$. Other factors held constant, the household closer to market points is more likely to access credit. This result is strongly evidenced in the case of cinnamon farm households in Van Yen district, where the transportation road is in poor condition and costly for cinnamon trading activities. In addition, the greater distance to the market can make

it hard for households to connect and complete credit applications with Agribank in the district centre. Mau A is the main town of Van Yen district, is a major potential market centre where a variety of markets are available. There are fresh product markets, cooperatives, cinnamon companies and a variety of supermarkets. The distance to this centre has an impact on farmers' access to markets.

The result further shows that households with collateral assets are more likely to have access to Agribank credit than one without collateral. This finding is strongly confirmed in both cinnamon and bamboo households. The two estimated coefficients of the variable COLAT are statistically significant at $p<0.01$. This result could be explained by the fact that the lending policy of Agribank relied mainly on collateral, commonly known as a red book in Vietnam, seen as a legal document allowing the bank to sell out the land if the borrowers cannot repay loans. It is therefore concluded that the ownership of a red book eases access to commercial loans from Agribank. Similarly, findings from the other developing countries indicated farmers' lack of land titles makes it hard for them to obtain credit. In Vietnam, land use rights, expressed through the ownership of land use right certificates can be used to secure bank loans. Provision of agricultural land use rights is essential to promoting agricultural investment in Vietnam (Simelton et al., 2017). However, the certificate of land use right is mainly issued to households, so all members of the household must agree and give written consent to complete mortgage procedures. This is also a constraint for using red books to secure bank credit.

4.6. Determinants of access to subsidized credit

Table 7 presents the estimated logit equation describing participation in subsidized credit programs. The dependent variable is a dummy variable with a value of 1 if households received subsides credit in the previous 24 months and 0 otherwise. There are five explanatory variables perceived to be associated with subsidized credit accessibility at a 1% level of statistical significance.

Table 7. Determinants of credit access constraints to Vietnam Bank for Social Policy's credit

Variables	Bamboo shoots			Cinnamon		
	Coefficient	Standard Error	Z statistics	Coefficient	Standard Error	Z statistics
Intercept	.29419	1.84574	0.16	–.69513	.95564	–0.73
AGE	–.02593	.02692	–0.96	–.01782	.01756	–1.01
EDU	–.12921	.09603	–1.35	–.03455	.04612	–0.75
ETHNI	–.16835	.57452	–0.29	–.94711**	.45263	–2.09
HLABO	–.18973	.22363	–0.85	–.07432	.15993	–0.46
MADIS	.01569	.05760	0.27	.10849***	.03220	3.37
MVISIT	.44286	.40220	1.10	–.14273	.14300	–1.00
BACOU	–.07123	1.26306	–0.06	.25347	.61310	0.41
FSIZE	–.07538	.79325	–0.10	–.08004	.05482	–1.46
COLAT	–3.37885***	.79085	–4.27	–.43193	.48384	–0.89
TRAIN	–.68363	.71244	–0.96	1.12340	.47599	2.36
UNION	3.80121***	.59968	6.34	4.01090***	.46447	8.64
Number of observations	163			319		
LR chi2(11)	79.82			156.88		
Prob > χ2	.00000			.00000		
Pseudo R2	.39100			.39090		
Correctly classified (%)	87.12			84.95		

Source: Author's regression using Stata 12.0 and survey data.
Note: *** significant at 1%; ** significant at 5%.

Unlike in the bamboo households, the coefficient of TRAIN is positive and significant. In Van Yen district, training is a principal tool to deliver techniques regarding cinnamon harvest, drying, and storage. Training is provided by agricultural extension stations through the district extension network. Content is focused on new and improved methods of cinnamon farming techniques, drying and storage. Access to technical assistance and extension services are believed to positively affect the use of modern technologies. In fact, farmers who have access to training services are more likely to obtain credit information and share their knowledge of credit use. The frequency of attending a training course was also among the factors shown to have an effect on participation in credit programs. This result collaborates with earlier studies that revealed access to training services is one of the most important factors either to enhance the technical capability or facilitate inputs for introduced technologies, thereby increasing the likelihood of using credit.

As expected, ethnic minorities such as Dao and Nung in Van Yen district are more likely to access subsidized credit. If all other variables in the model are held constant, ethnic minorities are more likely to receive subsidized loans compared to the Kinh majority. What is surprising is that ethnicity in Luc Yen is not significant. The ethnic majority in Luc Yen district (bamboo) is Nung people, which are regarded as ethnic minorities at the national level.

The positive and significant coefficient of UNION appears to be the result of two factors. First, unions share with their members not only farming and trading techniques, but also important information on credible sources. Second, unions serve as an important partner of the VBSP in selecting and screening potential credit applicants. Unions also cooperate with VBSP in delivering credit and collecting repayments. Households are in the position to derive better access to credit from the union membership. On the other hand, all subsidized credit programs in the sample communes put special emphasis on targeting poor women, who are predominantly members of women's unions. Local unions disseminate information to farmers and help them form interest groups to share and support each other in economic development activities. This result is consistent with the finding by Uronu and Ndiege (2018), which indicated that members of unions help households to strengthen social relations and motivate households to apply agricultural technologies and access markets.

5. Conclusion

The One Commune One Product (OCOP) program is regarded as a strategy for restructuring the agricultural sector towards increasing value-added of agricultural products and sustaining the livelihood of farmers in Vietnam. However, a key precondition for the success of the program is to create investment incentives for the OCOP producers as farm households. The provision of credit to OCOP producers, particularly those in remote areas and ethnic minorities, is therefore a priority for policy makers. This paper provides empirical evidence of the drivers and the extent of credit inclusion by farmers producing OCOP products in Northwestern Vietnam. The hypothesis that formal credit inclusion is determined by household endowments is examined using the logit model regression using primary data collected through face-to-face interviews with 319 cinnamon households and 163 bamboo households. In addition, in-depth interviews with banks, enterprises and government agencies were conducted in order to further support the analysis.

The analysis has confirmed that collateral greatly affects access to commercial credit. This finding suggests that the government should accelerate the process of granting land use right and property certificates to borrowers to be used as collateral. However, the use of a red book as collateral and credit limitation ignores farmers' ability to access and use credit. Although credit limitation and the collateral requirement are necessary for the bank to recover loans, uniform credit policy by the Agribank should not be applied to all farmers. Each farmer

should be judged on the basis of economic performance. In the long term, agricultural loans need to be renewed to get out of too much dependence on collateral. The bank needs to be more proactive in agriculture as a true partner in the agricultural value chain to find opportunities for loans without collateral.

The size of land, training, good road conditions connecting the nearest town or formal markets were found to be essential in increasing credit inclusion. Therefore, giving priority to low-income households with subsidized credit and policies such as land allocation, training on marketing, encouraging cooperation with farmer-based unions, and infrastructure can help OCOP farmers access credit. Another finding from this study is that the share of households with ownership of a bank account remains very low. International experience has also shown an improvement in financial awareness and usage of banking services can be obtained through facilitating access to banking accounts. To this point, relaxing access constraints to a bank account can contribute to national credit inclusion in a sustainable manner.

The credit gap between credit demand and supply exists and the lending terms and conditions employed by banks do not address the demand for credit by OCOP farm households. Mistrust exists between banks and applicant households due to the fact that banks lack reliable information regarding the cash flow and business of bamboo and cinnamon households in the region. The lack of information leads to reluctance among creditors to lend out the full amount required by households. Another important result from this study is that women's and farmers' unions serve an important role in providing credit to low-income households without collateral. Unions have the ability to easily access information on potential borrowers, which lowers the transaction costs of lending. Therefore, not only subsidized credit but also commercial credit could be expanded through farmer-based unions. Coordination between banks, unions and government agencies could be enhanced to create favourable conditions for farmers to access credit for OCOP production.

Finally, promoting multi-party cooperation and sharing risks and benefits can be a sustainable direction in connecting agricultural credit supply and demand. To exploit local knowledge in credit disbursement, the study recommends that a platform for a frequent meeting or digital data sharing between banks, households, firms and government agencies be developed to deal with the information gap. The platform can serve as a channel for providing farming record databases and credit packages for relevant actors.

Acknowledgement

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