


Gender differences in formal credit approaches: rural households in Vietnam

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In Vietnam, women have poorer access to formal credit than men. This article determines the extent to which borrowing constraints restrict women's access to formal credit and identifies the socioeconomic characteristics that determine formal credit discrimination. The study used secondary data from the Vietnam Access to Resources Household Survey (VARHS) published in 2013–14, and analysis was undertaken by econometric approaches such as logistic and multiple linear regression models and propensity score matching methods. The results show that among those participants who successfully obtained credit, approximately 85 per cent of women obtained less credit than men; and the amount of credit that women obtained was also less (on average, approximately 1.8 per cent less). Gender, number of years of schooling, marital status, participation in agricultural activities, off-farm employment, and ownership of agricultural land for a male-headed household positively influenced discrimination in obtaining credit and the amount of credit obtained. Moreover, the propensity score matching results found that the average increase in the credit obtained by males was 220,000 Vietnamese Dong (VND) and this is mainly due to discrimination in favour of men. The results suggest that policy action is needed to avoid discrimination in credit disbursement on the basis of gender.

Introduction

Many researchers and organisations (e.g. Diagne and Zeller 2001; Fletschner 2009; World Bank 2009, 2012; Elahi et al. 2017) have noted the unequal access to and distribution of credit among women and men. Lower

access to credit in agriculture, where women's labour is dominant, may deprive them of the ability to achieve agricultural productivity targets (Fletschner 2009; Dong et al. 2010; FAO 2011; Duy 2015).

Vietnam's agriculture contributes significantly to gross domestic product and the livelihood of the rural community: approximately

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ten million households are directly or indirectly engaged in small-scale agriculture. The rural economy of Vietnam heavily depends on the actions of ten million small-scale households in rural areas, of which 17 per cent are headed by women (Government of Vietnam (GoV) 2014). In some rural areas, the main agricultural activities are handled by women; however, women do not have equal rights in accessing institutional services (e.g. agricultural credit) (Murthy and Sankaran 2003; GoV 2014). Credit markets in Vietnam's rural areas are fragmented and suffer from significant state interference (McCarty 2001). Formal agricultural credit is generally provided by state-owned banks such as the Vietnam Bank for Agriculture and Rural Development (VBARD), the Vietnam Bank for the Poor (VBP), and People's Credit Funds (PCFs). However, networks of these banks are not very widespread in villages and remote areas; VBARD, for example, has branches at the district level and only a few at the community level. In addition, deviations in risk assessments and complex administrative procedures have resulted in underutilisation of activities by VBRAD and other banks (Putzeys 2002). Women in these areas have been found to have more limited access to credit than men (FAO 2011).

Many studies worldwide have found evidence of difficulties faced by women in formal credit markets; for example, difficulties in opening bank accounts or executing financial contracts because of legal barriers and cultural mores. Moreover, women have fewer rights over the agricultural assets that are generally used as collateral for loans; and discrimination is commonplace in private and public lending institutions, which often grant smaller loans to women than to men (Fletschner 2009; World Bank 2009; FAO 2011). According to FAO/UNDP (2002), in Vietnam females had less access to credit and had to pay a higher interest rate on the principle amount of a loan than their male counterparts. However, no study has focused on gender inequality in accessing formal credit in Vietnam. Therefore, this study has three main objectives: (1) to analyse whether the household head's gender

affects its ability to access formal credit; (2) to identify the factors that determine the difference between male and female heads of household with respect to access to formal credit value or amount; and (3) to estimate the impact of gender on the amount of credit accessed.

Research methodology

Data

The data used for this study were compiled from the Vietnam Access to Resources Survey (VARHS), which is conducted every two years by the Central Institute of Economic Management (CIEM), the Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD), the Institute of Labour Science and Social Affairs (ILSSA), and the Development Economics Research Group (DERG) at Copenhagen University, with financial support from Danida (Denmark's development cooperation, an area of activity under the Ministry of Foreign Affairs of Denmark). The survey was conducted in 2002 in rural areas in four pilot provinces and since 2006 it has expanded to 12 provinces throughout Vietnam (Ha Noi, Phu Tho, Dien Bien, Lai Chau, Lao Cai, Nghe An, Quang Nam, Khanh Hoa, Dak Lak; Dak Nong, Lam Dong and Long An). This study is based on data collected in 2013–14. The survey helps to understand the economic situation of households in rural areas of Vietnam by focusing on socio-economic information obtained on savings, gender bias, access to institutional services and household incomes, in addition to household access to production resources such as physical capital, financial capital, human capital and social capital.

Empirical framework

Factors that affect ability to access credit. To estimate the influence of various factors such as gender, family structure, and socioeconomic

variables on credit access, a logistic model was used. This statistical technique is widely used in the social sciences: for example, Mohamed (2003) and Garay (2006) used logistic regression to determine factors affecting micro-credit in Zanzibar and the Philippines. Okurut (2006) analysed the credit of poor farm households in South Africa using logistic regression, and similarly, Pham and Lensink (2007) used binary logistic regression to estimate the lending policies of informal, formal and semi-formal lenders in Vietnam. The general form of the logistic model is given as:

$$\text{logit}(Y_j) = \ln\left(\frac{p}{1-p}\right) = \alpha + \beta_i x_i + e_i \quad i = 1, 2, \dots, N \quad (1)$$

where Y_i represents a dichotomous dependent variable (1 = access to credit; 0 = no access to credit), p ($1 - p$) shows the probability of the dependent variable taking the value one, X_s are the independent variables that may affect the credit accessed by respondents, α is the intercept, β_i represent the parameters that must be estimated with respect to the value of x_i , and e_i is the error term. The definition of parameters is given in Table 1. The estimation of parameters using the simple ordinary least square method is not appropriate; therefore, the maximum likelihood method was used for parameter estimation (Elahi et al. 2017).

Furthermore, to estimate the role of factors on the amount of credit accessed by male and female-headed households, we used multiple linear regression (Quddus and Amin 2010). The general form of this model can be represented as:

$$\ln Y_i = \beta_0 + \beta_i \ln X_i + \ln e_i \quad i = 1, 2, \dots, N \quad (2)$$

where Y_i represents the amount of credit granted to male and female heads of household, \ln is the natural logarithm, β_0 is the constant, and the β_i are the parameters to be estimated. To check the reliability of the data and statistical models used, we performed tests such as the variance inflation factor to check for multicollinearity and the Durban-

Watson to check for autocorrelation and independent errors. However, no multicollinearity or autocorrelation was found.

Propensity score matching technique (PSM).

Following Elahi et al. (2017) and Zulfiqar and Thapa (2016), the impact of gender on the amount of credit accessed was estimated using a PSM method to eliminate self-selection bias. The PSM followed a two-stage process: in the first stage of the estimation, a dependent dichotomous variable (gender) was regressed against various socioeconomic variables using a logistic regression, and in the second stage, nearest neighbour matching (NNM) was used to compare the results by gender using the propensity score obtained in the first stage. The PSM technique helps to remove the effects of observable factors on the outcome variables (amount of formal credit accessed).

Results and discussion

Descriptive statistics

A summary of the descriptive statistics of male and female farmers, including their socioeconomic characteristics, credit accessed, amount of loan, and other information is given in Table 1. Compared to female-headed households, male-headed households have more access to credit information and the amount they borrow is also higher (1.8 per cent). It may be that this difference in credit obtained is due to less access to credit information for women (Goetz and Gupta 1996; Pal and Ghosh 2007); however, other factors may also influence this difference.

The socioeconomic information shows that the men were in a more productive age range, more education, and off-farm employment (which may have made them more aware of credit access). Also, those respondents who obtained credit had a lower monthly net income. It is therefore possible that respondents with lower incomes preferred to avail themselves of agricultural credit to fulfil their

Table 1
Basic statistics of borrowers and non-borrowers, characterised by gender

Variables	Definition of variables	Access to credit			No access to credit		
		Male head of HH (N = 800)	Female head of HH (N = 130)	Difference	Male head of HH (N = 294)	Female head of HH (N = 69)	Difference
Credit obtained	Dummy(1 = obtained; 0 = Not obtained)	0.86	0.14	0.72**			
Amount of loan	'000 VND	10,060	9880	180***			
Access to credit information	Dummy(1 = yes; 0 = no)	0.90	0.87	0.02***	0.25	0.18	0.07**
Age	Years	50.98	60.49	-9.51**	51.85	62.76	-10.91**
Education	Years	8.91	8.26	0.64***	5.00	6.00	1**
Marital status	Dummy(1 = married; 0 = not married)	0.76	0.27	0.49**	0.21	0.68	0.47**
Off-farm employment	Dummy(1 = yes; 0 = no)	0.44	0.21	0.23***	0.30	0.20	0.12**
Net income	Monthly income ('000 VND)	10.32	10.07	0.25***	13.01	12.76	0.25**
Participation in agricultural activities	Dummy(1 = yes; 0 = no)	0.88	0.66	0.21**	0.40	0.64	0.24***
Participation in HH chores	Dummy(1 = yes; 0 = no)	0.79	0.92	-0.12*	0.81	0.93	-0.12*
Ownership of agricultural land	Dummy(1 = yes; 0 = no)	0.87	0.40	0.47***	0.40	0.23	0.17*
Dependency ratio	Economically dependent persons in HH (N)	1.38	1.25	0.12***	1.41	1.34	0.07**

HH = household.

Note: The Mann-Whitney test was used to determine the difference between two mean values, where ***, ** and * represent levels of significance at $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively; standard deviations (SD) are in parentheses.

Source: VARHS (2013–2014).

crop objectives. Moreover, a greater percentage of men were engaged in agricultural activities, while a greater percentage of females opted to do household chores. Furthermore, the dependency burden of households headed by men is almost equal to that of households headed by women. In the group of those who obtained credit, the majority of males, almost 90 per cent, held ownership of agricultural land.

Factors affecting formal credit access

The significant impacts of factors affecting formal credit access are shown in Table 2. The results show that education significantly increased the likelihood of obtaining credit of males and females: by 0.10 and 0.11 times, respectively. These results are in line with previous research (Soman and Cheema 2002; Kumar et al. 2010). Having a male as the

household head increased the likelihood of obtaining credit by 0.49 times; however, for females, obtaining credit is not dependent on whether or not the female is a household head. Having a married male as a household head increased the likelihood of the household obtaining credit by 1.22 times. This result may reflect the greater responsibilities in life for men after marriage; support for this argument can be found in a study arguing that in a majority of cases, married men were more likely to be financially responsible for their families (Ackerly 1995).

Male participation in agricultural activities and in off-farm employment significantly increased the likelihood of obtaining credit, by 0.14 and 0.44 times, respectively. Similar findings have been found by De Janvry and Sadoulet (2001), Escobal (2001), and Hazarika and Alwang (2003). It is also the case that credit obtained is highly dependent on the ownership of agricultural land; this parameter was found to be highly significant, and the likelihood of obtaining credit increased by 0.44 times when males had ownership of agricultural land. These results are also in line with previous studies (Rand 2007). By contrast, an increase in net income significantly reduced the likelihood of obtaining formal credit; this might be because these households have sufficient resources to fulfil their needs and do not need to avail themselves of formal credit.

We divided the participants into two groups based on gender and used the multiple linear regression model to estimate the level of significance of the variables on the amount of credit obtained (see Table 3). Education is highly statistically significant in both male and female-headed households: a one-unit increase in education caused a 0.019 and 0.024 times increase in the amount of credit obtained by males and females, respectively. Education might increase exposure and the wisdom to analyse daily matters; and it could allow people to approach technology in a more productive manner (Jung and Thorbecke 2003, Schuller et al. 2004). Being married has a significant influence on the amount of credit obtained by males; but this is not true for

Table 2
Logit model results (dependent variable
1 = credit obtained; 0 = otherwise)

Variables	Coefficient (SD)
Age	0.012 (0.02)
Education of male HH head	0.10 (0.04)**
Education of female HH head	0.11 (0.058)**
Male as the HH head	0.49 (0.20)***
Female as the HH head	0.61 (0.34)
Dependency burden	0.19 (0.07)**
Marital status of male	1.22 (0.84)***
Marital status of female	0.81 (0.55)
Male participation in agricultural activities	0.14 (0.051)***
Female participation in agricultural activities	0.15 (0.11)
Off-farm employment of male	0.44 (0.21)*
Off-farm employment of female	0.67 (0.46)
Male ownership of agricultural land	0.78 (0.28)***
Female ownership of agricultural land	0.70 (0.40)
Net income of male HH	-0.50 (0.21)**
Net income of female HH	-0.44 (0.20)*
Constant	-8.50 (1.11)***
Log likelihood	-119.10

HH = household.

Note: ***, ** and * represent levels of significance at $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively; standard deviations (SD) are in parentheses.

Table 3
Factors affecting the amount of credit (log–log regression model)

Variables	Pooled sample (N = 930)	Male headed HH borrowed credit (N = 800)	Female-headed HH borrowed credit (N = 130)
	Coefficients (SD)	Coefficients (SD)	Coefficients (SD)
Age	0.013 (0.009)	0.015 (0.01)	0.011 (0.008)
Education	0.051 (0.016)***	0.019 (0.001)***	0.024 (0.018)*
Marital status	0.122 (0.03)***	0.2 (0.07)***	0.3 (0.19)
Off-farm employment	-0.19 (0.082)*	-0.22 (0.09)**	-0.071 (0.08)
Participation in farm activities	0.36 (0.16)**	0.42 (0.19)*	0.25 (0.15)
Participation in HH chores	0.029 (0.017)	0.039 (0.021)	-0.22 (0.13)
Dependency ratio	0.024 (0.009)**	0.014 (0.005)****	0.31 (0.13)
Credit information	0.07 (0.021)*	0.17 (0.04)**	0.021 (0.03)
Net income	-0.62 (0.13)***	-0.76 (0.17)***	-0.41 (0.15)*
Owned agricultural land	0.06 (0.01)***	0.081 (0.031)**	0.19 (0.12)
Constant	4 (0.91) ***	2.77 (0.63)***	9.11 (1.95)***
R ²	0.62	0.65	0.6

HH = household.

Note: ***, ** and * represent levels of significance at $p < 0.01$, $p < 0.05$ and $p < 0.1$, respectively; standard deviations (SD) are in parentheses.

females. It may be that the responsibilities of married males make them more interested in obtaining credit. Similar results are seen in Table 1 for obtaining formal credit. Participation in off-farm activities may create awareness and interest among both males and females in obtaining loans and may influence the amount of credit obtained (Pitt and Khandker 1998); however, only the participation of males in off-farm employment is statistically significant and increased the likelihood of obtaining credit: by 0.42 times. Further, the participation of males in agricultural activities significantly impacted the amount of credit obtained. These results are in line with Diagne (1999).

Although the majority of families in Vietnam have a nuclear structure, the results show that at least one person (children or parents, mother or father) in a family is dependent on working family members (Table 1), and the dependency burden in both male and female-headed families significantly impacted the amount of credit obtained. Males have more credit information, and in this regard, credit information increased the likelihood of

obtaining credit by 0.17 times. Similarly, the ownership of agricultural land is a very important factor in obtaining credit (Feder and Onchan 1987). We found the majority of men owned their agricultural land and that this variable is statistically significant; meaning that an increase of one unit in land

Table 4
Impact of gender on credit obtained

Variables	Amount of credit obtained ('000 VND)
Average gender effect for the matched using NNM method (ATET/ATT)	220 (20.2)***
Average gender effect for all (ATE)	180 (18.55)***
Observations (N)	890

ATE = average treatment effect; ATET = average treatment effect on the treated; NNM = nearest neighbour matching.

Notes: *** represents level of significance at $p < 0.01$, respectively; standard deviations (SD) are in parenthesis.

ownership increased the amount of credit obtained by 0.08 units.

Impact of gender on amount of credit obtained

In the next step, we estimated the average effect of gender on credit obtained before and after matching (see Table 4). The results show that the average treatment effect on the treated (ATET) increased the credit obtained by males on average by 220,000 VND. However, the average treatment effects (ATE) presented a lower increase in credit than the ATET. This difference may be due to selection bias, as the observable factors may have affected the credit obtained, and this potential bias is removed using a PSM technique. The results may be biased if we do not use a matching technique.

Conclusions and policy implications

This study explored the impact of gender, along with other socioeconomic factors, on

credit access and on the amount of credit obtained using different econometric parametric (logistic regression, multiple linear regression and PSM) and non-parametric (Mann–Whitney test) methods. The study found that a comparatively greater percentage of males than females availed themselves of formal credit and that the amount of credit obtained was higher. Moreover, education, marital status, participation in agricultural activities, off-farm employment and ownership of agricultural land by the male HH head significantly increased the likelihood of obtaining credit and the amount of that credit. However, the likelihood of credit access and the amount of credit obtained decreased with an increase in net income for both male and female-headed households. According to PSM, the difference in credit obtained is on average 220,000 VND between men and women, and this is mainly caused by the gender difference. The study findings stress the need to look at policy in the banking sector to eliminate gender discrimination in credit access and the amount of credit obtained.

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