THE IMPACT OF JOINT LAND TITLING: EVIDENCE FROM VIETNAM

Cuong Viet Nguyen[1,2]

[1] *Vietnam National University, Hanoi, Vietnam*
[2] *Thang Long University, Hanoi, Vietnam*

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ABSTRACT

In Vietnam, Land-Use Right Certificates (henceforth referred as LURCs) can be issued to either individuals or households. If the land and asset are defined as common property of husband and wife, both have the right of land use or asset ownership. In this study, we assess the impact of land use rights on household welfare using Vietnam Household Living Standard Surveys 2004 and 2014. We find a strong effect of jointly-titled LURCs of residential land on formal and informal credit. Having jointly-titled LURCs increases the amount of formal credit by 35.1% and informal credit by 18.9%. We also estimate the effect of having jointly-titled LURCs on per capita expenditure. Jointly-titled LURCs of agricultural land and residential land help households increase per capita expenditure by 1.6% and 2.5%, respectively.

KEY WORDS

land titling, gender, poverty, impact evaluation, Vietnam

JEL CODES

Q15, R14, O12, O15

1 INTRODUCTION

A positive correlation between gender equality and economic development is well documented (Appiah and McMahon, 2002; Duflo, 2012; Diebolt and Perrin, 2013; Bertay et al., 2020). Policy-makers as well as researchers have long been interested in policies, which can reduce gender inequality (e.g., Grown et al., 2005; Eswaran, 2014; Grown et al., 2016; Sharma and Tarp, 2018). In many countries, especially in low-income countries, women are found to have less legal rights to property than men, (e.g., Rao, 2005; Izumi, 2007; Roy, 2015; Chigbu, 2019; Deere and León, 2022). Land is an important form of property that serves as a resource for increasing production, improving access to credit, and reducing vulnerability (Roy and

Tisdell, 2002; Campus, 2016; Meinzen-Dick et al., 2019). There is an influential argument that having land rights can help women increases their power in the decision-making process (Agarwal, 1994; Izumi, 2007; Menon et al., 2017; Meinzen-Dick et al., 2019). An important question is whether joint land titling for both men and women can increase household welfare.

In this study, we examine whether having jointly-titled land-use right certificates (LURCs) can increase living standards of households in Vietnam. We estimate the effect of both joint titling of agricultural land as well as residential land using district fixed-effect regression and data from Vietnam Household Living Standard Surveys (henceforth referred as VHLSS) in 2004 and 2014. The empirical results show beneficial effects of joint land titling. Having jointly-titled LURCs of agricultural land and residential increased increase per capita expenditure by 1.6% and 2.5%, respectively. A mechanism through which joint land titling increase household expenditure is through raising loans, both informal and formal sources, and nonfarm income.

Our study is expected to contribute empirical findings on the effect of joint land titling to the literature on gender equality and economic development. There are several studies that focus on the role of ensuring legal rights in women's empowerment (Datta, 2006; Field, 2007; Wiig, 2013; Newman et al., 2015; Menon et al., 2017; Widman and Hart, 2019; Cherchi et al., 2019). However, most studies look at the outcomes of woman empowerment. There is little evidence on the effect of joint land titling on aggregate measures of living standards of households. An exceptional study is Menon et al. (2017), which also examine the effect of joint land titling on per capita expenditure in Vietnam using VHLSSs 2004 and 2008. Compared with Menon et al. (2017), we use more recent data, i.e., the 2014 VHLSS, and we investigate the role of joint titling of not only agricultural but also residential land. In addition, we show that increasing formal and informal credit is one of channels through which joint land titling increase household's expenditure. To our knowledge, our study is one of the first attempts to look at the effect of joint land titling on credit of households.

Vietnam is an interesting case to look at. The country has achieved significant success in improving gender equality and empowering women. Compared to other countries with similar levels of economic development, Vietnam has higher gender development indexes (United Nations, 2008). However, there is still significant inequality with regard to gender in both perception and economic conditions. Nguyen and Tran (2017) find that families continue to have children until they produce a male child. According to the 2016 VHLSS, monthly wages of women are 18 percent lower than men. It is estimated that the overall lifetime prevalence rate for physical violence against women by husbands in Vietnam is 31.5 percent (GSO, 2010).

Land-holding is the most common form of property for families, especially in Vietnam – a country with a high proportion of rural and agricultural households. The Marriage and Family Law of Vietnam states that properties that are purchased during marriage belong to both husband and wife. The Vietnamese Government's Decree No. 70, effective since October 2001, also regulates that all documents indicating the ownership of properties must be in the names of both spouses. A LURC must have the names of both husband and wife. The 2003 Land Law also requires that names of both husband and wife be written explicitly on LURCs. The LURCs issued since 2003 often contain the names of both spouses, but LURCs issued before 2003 might contain the name of only one spouse, and that is usually the husband. As a result, lands have been disproportionately controlled by men in Vietnam. If a land plot is "defined as common property" of the husband and wife, both have the right of land use even though one of them may not be named on the LURC. However, World Bank (2008) shows that a woman does have more power in decision-making processes in her family if her name is written explicitly in the LURC.

In Vietnam, there have been several studies on the role that LURCs play in the lives of women. Except for Menon et al. (2017),

which is discussed above, most studies rely on qualitative methods. These studies have shown that when women are not named in LURCs, they tend to have less economic power in the family. Greig et al. (2006) conducted a survey of 82 female business owners. According to these women, a main reason why women are less likely to access formal capital than men is that their names are not on LURCs. Ethnic minority women tend to receive less land than men in divorce and inheritance (Do and Hoang, 2005; Nguyen, 1999). When husbands are absent from the home or do not give consent, women cannot use LURCs to obtain loans from a bank (World Bank, 2008). Without land use rights, women are more economically dependent on their husbands. They are more afraid of divorce and suffer more domestic violence (World Bank, 2008). Razavi (2003) and Tinker and Summerfield (1999) indicate that LURCs can improve decision-making power of women and sustainably reduce gender inequality.

This paper is structured into 5 sections. Following the introduction section, the second section describes data sets and analytical methods used in this study. The third section presents the descriptive analysis of land and land titling in Vietnam. The fourth section discusses the empirical results from the impact of joint titling of LURCs on household welfare. The fifth section summarizes the conclusions of the study and discusses policy implications.

2 DATA AND METHODOLOGY

Data for the study comes from VHLSSs in 2004 and 2014. The sample household size of the 2004 and 2014 VHLSSs is 9,188 and 9,388, respectively. These VHLSSs are representative for the national, rural and urban, and regional levels. The VHLSSs were conducted by the General Statistics Office of Vietnam (GSO) with technical support from the World Bank. Although VHLSSs have been conducted every two years since 2002 by GSO, only the 2004 and 2014 VHLSS contain a special module on land and do contain information on land area as well as land titling of both agricultural and residential lands. This is the main reason why we use these two surveys in this study. The VHLSSs contain detailed information on households and household members. Individual-level data on individuals include demography, education, health care, and employment. Household-level data include assets, land holdings, production activities, access to credit, social protection programs , income and expenditure.

The most challenging is how to estimate the impact of land joint titling on outcomes of and households. We examine the effect of having land use right or having name on LURCs on household outcomes as follows:

$$Y_{j,t} = \beta_0 + \text{Joint}_{j,t}\beta_1 + X_{j,t}\beta_2 + \\ + T_t\beta_3 + v_j + u_{j,t}, \quad (1)$$

where $Y_{j,t}$ is an outcome of interest of household j in year t. The outcome variables include loans from different sources, share of income from different sources in total income, and per capita expenditure. $\text{Joint}_{j,t}$ is a dummy variable indicating household j has a joint titling of LURCs. The reference group is households who have LURCs but with only a single name on LURCs. It means that households without LURCs are excluded. In addition, we also exclude households, in which LURCs is held by a single person (who is unmarried, divorced or widowed). In other words, we compare married couples with joint-titled LURCs with married couples with LURCs held by only a husband or a wife. Model (1) is estimated using the household-level data from VHLSSs. $X_{j,t}$ is a vector of explanatory variables which consist of household-level variables. T_t is a set of year dummies. v_j denotes time-invariant variables of districts, and $u_{j,t}$ denotes unobserved variables on households.

A problem in estimating the above equations is the selection or endogeneity bias of LURCs. Individuals who have LURCs and households with joint land titling can be different from other households. To address this problem, we control for a number of observed variables including ethnicity, age, gender, education, household composition, and land areas. In Vietnam, LURCs are issues by district authorities. Thus we also control for dummies of districts, v_j. District variables can affect obtaining LURCs and at the same time the outcomes of individuals and households. Failure to control district variables can lead to biased estimates.[1] Using district fixed-effects regression, we expect to mitigate the selection bias, therefore being able to measure the effect of joint land titling.

3 LAND TITLING IN VIETNAM

3.1 Use of Land without LURCs

In this study, both agricultural land and residential land is analyzed. The agricultural land consists of annual cropland, perennial cropland, forestry land, and aquaculture surface. However, separate analysis of all agricultural land types is not presented in consideration of the breadth of material. Instead, the analysis for annual cropland and the remaining agricultural lands are grouped into "other agricultural land". Annual cropland is more important and common than other agricultural land. The main annual crops in Vietnam include rice, corn, potato, cassava, tomato, and other vegetable.

Fig. 1 reports the percentage of households using or managing lands, and the average land areas of these households. The percentage of household using and managing agricultural land decreased over time. In 2014, 48.2 percent of households used or managed annual cropland, and 22 percent of households used or managed other agricultural land. The average area of annual cropland (computed for households with annual cropland) and the other agricultural land (computed for households with these lands) was 4,794.5 and 10,361.4 square meters, respectively.

In VHLSS, residential land consists of house area and surrounding area. It should be noted that data on residential land are available in VHLSS 2004 and 2014. The percentage of households using or managing residential lands was 88 percent in 2014. This means that 12 percent of total households shared residential land with other households. It is fairly common in Vietnam that parents are living with their adult children in the same area, but they are counted as two or more households. The average residential area decreased from 711 to 455 square meters during the period 2004–2014. This decrease reflects the fact that population increased over time, while the total residential land area did not increase.

LURCs can be issued to individuals (male only or female only) or households (husband and wife).[2] If a LURC is granted to one or many persons, only the persons named on the certificate have the right of land use or ownership of properties attached to land. A LURC that is "issued to a household" often contains the name of one representative house-

[1] Two better estimation strategies (when randomization is not possible) are instrumental variables regression and household fixed-effects regression. Instrumental variable regression requires an instrument that is correlated with LURCs but not outcomes. This study was unable to find such an instrument. For example, the study used the proportion of joint-titled LURCs of provinces as the instrument for the joint-titled LURCs of households. However, this instrumental variable does not work well. The first-stage is strong, but the coefficients are extremely large (more than 10 times of OLS coefficients). This suggests that this instrumental variable is correlated with the error terms. Household fixed-effects regression control for time-invariant household variables using panel data. Since panel data are not available, this method cannot be used in this study.

[2] LURCs are issued by local authorities (provincial-level and district-level People's Committees). LURCs can have different names such as land use right certificate, land tenure certificates, certificate of ownership of residential houses and land use rights, certificates of land use rights, ownership of houses and other assets attached to land. They can be referred to as red book and pink book.

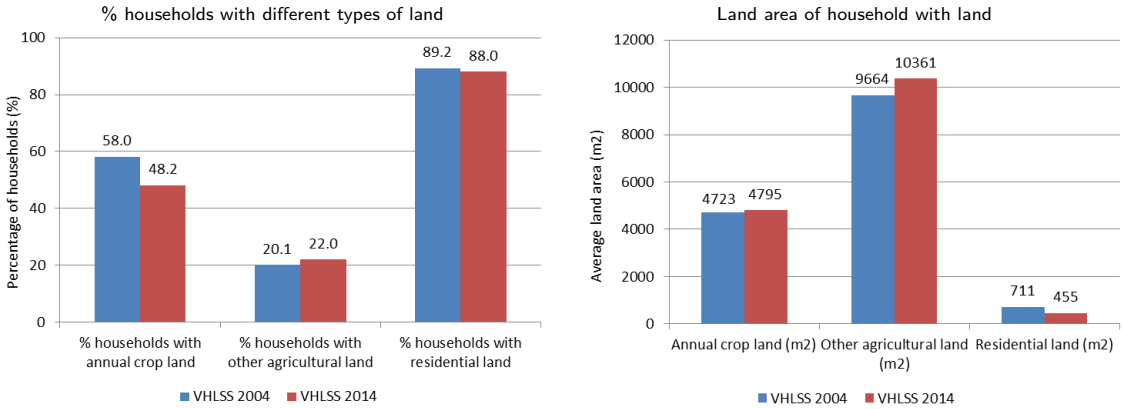


Fig. 1: Households using land and average land area (estimation from VHLSS 2004 and 2014)

hold member (usually the household head). In this case, ownership and use rights to the land and property stated on the LURC belong to all persons named in the household registration book, regardless of whether they are named in the certificate. It means that a person still has ownership and use rights to a land plot even if his or her name is not written in a LURC.

Tab. 1 presents the percentage of land area without LURCs by different characteristics of households. The percentage of annual cropland area without LURCs increased slightly from 26 percent to 30.5 percent during the period 2004 to 2014. However, the percentage of other agricultural land without LURCs decreased from 30.1 percent to 24.6 percent during the same period. The percentage of residential lands without LURCs also decreased from 22.6 percent in 2004 to 17.8 percent in 2014.

The proportion of land area without LURCs differs across regions and for different types of land. For example, Central Highlands has the highest rate of not having LURCs of annual croplands, but South Central Coast has the highest rate of not having LURCs of other agricultural lands. Regarding residential lands, the incidence of households without LURCs is highest in North West.

Tab. 1 also presents the proportion of land area without LURCs by gender and age of household heads. In 2014, female-headed households were more likely to have LURCs than male-headed households, especially for annual cropland. In 2014, 31.7 percent of annual cropland area of male-headed households did not have LURCs, while this rate for female-headed households was 22.6 percent.

In the 2014 VHLSS, various reasons emerge why households do not have LURCs. For annual croplands, 39.4 percent of land area without LURCs is due to the process of obtaining LURCs. Reclamation is responsible for 32.9 percent of cropland area without LURCs (Fig. 2). And about 17.9 percent of cropland area does not require LURCs by households. A small proportion of cropland area in dispute or conflict also has no LURCs. The reasons for not having LURCs for other agricultural land are rather similar to those for annual cropland. For residential land, the main reason is in the process of obtaining LURCs, accounting for 64.4 percent not having LURCs while another 15.7 percent of residential land does not need LURCs.

3.2 Land Titling by Gender

In the following analysis of titling by gender of holders, the discussion will focus on LURCs held by only male, only female or both (i.e., joint titling). Land area without LURCs is not considered in this particular analysis. As noted, there is a category of LURCs that are granted to households, but only a household head is named in this type of LURC. There is no information in VHLSS on individual-type or household-type of LURCs. Thus, LURCs that are granted to households would be defined as

Tab. 1: Percentage of land area without LURCs, 2014 (estimation from VHLSSs 2004 and 2014)

	Annual cropland		Other agricultural land		Residential land	
	2004	2014	2004	2014	2004	2014
Total	26.0	30.5	30.1	24.6	22.6	17.8
Region						
Red River Delta	28.9	45.3	32.2	22.1	29.1	17.3
North East	18.9	29.4	25.6	31.3	17.4	18.0
North West	51.2	50.6	12.3	24.4	23.9	29.1
North Central Coast	28.5	37.2	44.7	12.2	25.3	12.4
South Central Coast	34.8	40.5	34.5	43.4	18.1	16.3
Central Highlands	55.7	56.3	49.7	34.6	23.1	16.3
Southeast	39.4	22.1	35.0	25.2	25.7	24.4
Mekong River Delta	8.7	10.0	17.7	15.3	17.3	17.6
Gender of household head						
Male	26.3	31.7	29.9	24.7	22.2	18.3
Female	24.6	22.6	31.4	22.9	24.2	16.1

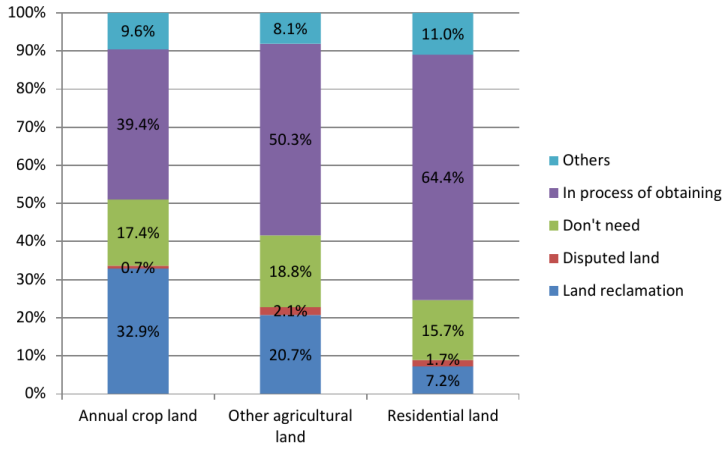


Fig. 2: Distribution of land area by reasons for not having LURCs, 2014 (estimation from VHLSS 2014)

single-titled LURCs since these LURCs contain the name of only one representative household member.

Tab. 2 shows a remarkable increase in the joint titling of LURCs over time. The left panel of the table presents the distribution of all LURCs ("whole sample") by joint titling status. In 2004, only 11.6 percent of LURCs of annual cropland area was joint-titled. In 2014, the proportion of joint-titled LURCs of annual cropland increased to 38.3 percent. The percentage of joint-titled LURCs of other agricultural land and residential land also increased significantly over the same period. Clearly, the legal regulation in Land Law 2013 has been effective and contributed to the success in issuing joint-titled LURCs in Vietnam.

The percentage of LURCs held by only female was quite stable over time, while the percentage of LURCs held by only male decreased significantly because of increasing joint-titled LURCs. However, the proportion of LURCs held by only male is still remarkably higher than that held by single female. In 2014, 46 percent of LURCs of annual cropland were held by only male, while 15.7 percent of LURCs were held by only female. For residential land, males are also more likely to have LURCs than female.

Tab. 2: Distribution of LURCs by gender of holders (estimation from VHLSSs 2004 and 2014)

	Only male	Joint	Only female	Total
Annual cropland				
VHLSS 2004	70.9	11.6	17.5	100
VHLSS 2014	46.0	38.3	15.7	100
Other agricultural land				
VHLSS 2004	71.2	13.9	14.9	100
VHLSS 2014	45.2	41.4	13.3	100
Residential land				
VHLSS 2004	64.7	15.7	19.7	100
VHLSS 2014	34.5	44.6	20.9	100

Gender inequality lies not only in titling of LURCs but also in the size of land holdings. Fig. 3 shows that the average land area (both agricultural and residential land) with LURCs held by only female is smaller than that with LURCs held by only male. Moreover, residential land with LURCs held by only male is larger than land with joint-titled LURCs or only female-titled LURCs. Simply looking at the distribution of LURCs by holders' gender does not reflect the full picture of the gender inequality in land use rights.

Finally, we use regressions to examine multivariate correlation between land titling and characteristics of households in the 2014 VHLSS. Tab. 7 in the Annex presents these results. The sample consists of plots of agricultural and residential lands. The dependent variables include a dummy indicating whether a land plot is titled and a dummy indicating whether a land plot is jointly titled. Overall, residential lands are more likely to be jointly titled, then perennial crop lands and annual crop lands. Residential lands which have a higher area are more likely to be titled but less likely jointly titled. Households with older and more-educated heads are more lily to have titled lands and joint-titled lands than households with younger and less-educated heads. Households with higher expenditure tend to have a higher proportion of titled lands as well as jointly-titled lands.

4 THE IMPACT OF LAND JOINT TITLING

Since land is important collateral for borrowing in Vietnam, land use rights have a positive effect on households by increasing access to credit (World Bank, 2008). The role of credit in increasing household production and reducing poverty has been well documented (e.g., Khandker, 2005; van Rooyen et al., 2012). In Vietnam, micro-credit as well as credit from informal sources can have a direct effect on poverty reduction (e.g., Nguyen, 2008; Swain et al., 2008; Lensink and Pham, 2012; Nguyen and van den Berg, 2014). With land use rights, women also have better access to credit and, as a result, can increase their opportunities for employment and give stronger voice to decision-making in their households. Qualitative research from World Bank (2008) find that "women feel they have more freedom in making decisions to take and use loans when their names are listed on the LTCs".

Fig. 4 and 5 show the important role of LURCs on access to formal credit. As shown in Fig. 4, the average amount of formal credit of households having agricultural land with only female-named LURCs was 7,090,000 VND in 2014. The formal credit for households with joint-titled LURCs was 6,429,000 VND. Households without LURCs and households with only male-named LURCs had remarkably lower amounts of formal credit at 4,433,000 and 3,885,000 VND, respectively.

Similarly, households with joint-titled LURCs of residential land also had larger amounts of formal credit than other households (Fig. 5). Informal credit and microcredit differed slightly among households with different titling status of LURCs since these types of credit do not depend largely on collateral. This estimate is also consistent with the estimate of the percentage of households using lands as collateral for borrowing. In the 2014 VHLSS, there is a question with regard to whether households have used lands as collateral to obtain loans. Around 12 percent households reported that they had used

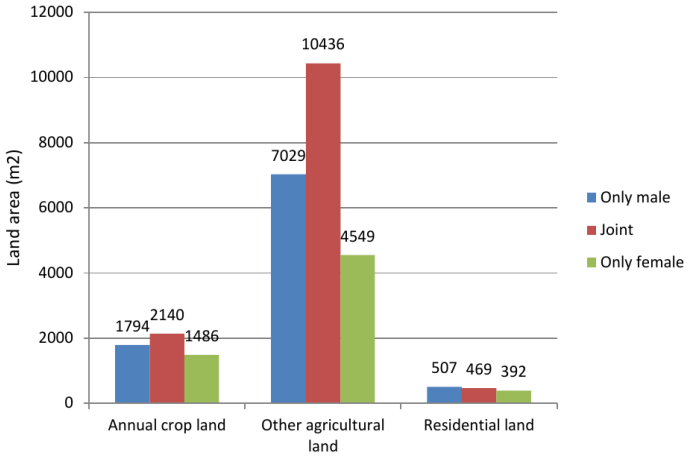
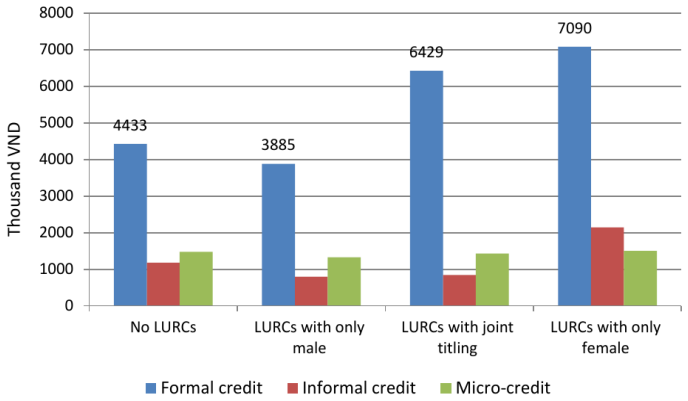


Fig. 3: The average land area by LURC titling, 2014 (estimation from VHLSS 2014)



Note: The credit sources are defined based on questionnaires of VHLSS 2014. In this study, formal credit includes loans from banks and other credit institutions. Informal credit consists of loans from private lenders, credit groups, friends, and relatives. Micro-credit is loan from Vietnam Bank for Social Policies.

Fig. 4: Average loan of households by titling status of agricultural land LURCs, 2014 (estim. from VHLSSs 2004, 2014)

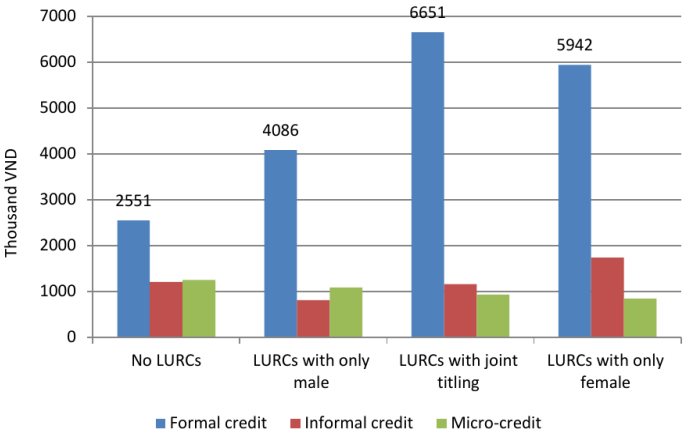


Fig. 5: Average loan of households by titling status of residential land LURCs, 2014 (estim. from VHLSSs 2004, 2014)

agricultural lands as collateral to obtain loans. This rate does not differ for households with and households without joint-titled LURCs on agricultural land. The rate of households using residential lands as collateral to obtain loans is higher; this rate differs between households with and household without joint-titled LURCs. Around 22 percent of households with joint-titled LURCs used residential lands as collateral to obtain loans, while this rate for households without joint-titled LURCs on residential land was 17 percent.

Fig. 4 and 5 do not represent causality of LURCs on credit access. Households with different titling statuses of LURCs can be different in other characteristics, which can also affect credit access. The regression method is used in this study to control for the differences in several characteristics that can affect the titling statuses of LURCs.

In Tab. 3 and 4, we run regression of households' access to credit and other household outcomes on joint land titling and control variables. The statistics of household variables is presented in Tab. 5 and 6 in the Annex. The impact evaluation of land joint titling for this study compares the outcomes of households with joint-titled LURCs and the outcomes of households with single-titled LURCs. Unlike the study by Menon et al. (2017), which use households without LURCs as the comparison group, this study drops households without LURCs. Households without LURCs often rent a house or land; they differ from households with joint-titled LURCs and account for a small proportion of households. Therefore, households with single-titled LURCs are used as the comparison group. Moreover, this group will be the targeted households for the policy of joint-titled LURCs. Control variables include age, gender, and education of household heads, ethnicity, urban dummy, household composition, land area, and district dummies. The reason why the study controls for district dummies (or also called district fixed-effects regression) is because that district People's Committees are responsible for issuing LURCs.

Tab. 3 and 4 present the coefficients of LURCs in regressions. The full regressions are reported in Tab. 8 and 9 in the Annex. It shows that the most direct effect of LURCs is on access to credit. Again, a regression was run on loan sizes from different sources on joint-titled LURCs of agricultural land (Tab. 3) and of residential land (Tab. 4). There are no significant effects of joint-titled LURCs of agricultural land. However, there are strong effects of joint-titled LURCs of residential land on formal and informal credit. Specifically, having joint-titled LURCs increases the amount of formal credit by 35.1 percent and informal credit by 18 percent.[3] The coefficient of micro-credit has a negative sign and is not statistically significant. This is expected since micro-credit does not require collateral. Our finding is consistent with qualitative study from World Bank (2008), which shows that LURCs can help households to be more likely to borrow and also help women feel more confidence in decision-making process.

A possible reason why the effect of joint-titled LURCs of residential land on loan is larger than the effect of joint-titled LURCs of agricultural land is that residential land values are higher than agricultural land values. According to the 2014 VHLSS, the average value of residential land of households is around 665 million VND, which is twice as much as the average value of agricultural land. In addition, there are no term limits for LURCs of residential land while the term of LURCs of annual cropland and perennial cropland is 20 and 50 years, respectively.

Having joint-titled LURCs of agricultural land does not affect the income structure of households. However, having joint-titled LURCs of residential land increases the share of non-farm business by 1.8 percentage points. This implies an increase in loans used in non-farm business. Finally, the study estimates joint-titled LURCs of agricultural land and of

[3]The coefficient of variable 'joint titling of residential land' in the regression of log of formal credit is 0.3008. The difference in log of formal credit between households with and households without joint titling of residential land is: $\log(\text{Credit1}) - \log(\text{Credit0}) = 0.3008$, or $\log(\text{Credit1}/\text{Credit0}) = 0.3008$. Thus $\text{Credit1}/\text{Credit0} = \exp(0.3008) = 1.351$. It means that the amount of formal credit of households with joint titling of residential land is around 35.1 percent higher than that of households without joint titling of residential land.

Tab. 3: Regression of household-level dependent variables on joint titling of agricultural land

Explanatory variables	Log of formal credit (thousand VND)	Log of informal credit (thousand VND)	Log of micro-credit (thousand VND)	Share of farm income in household total income	Share of non-farm income in household total income	Share of wage income in household total income	Share of income from other sources in household total income	Log of per capita expenditure
Joint titling in agricultural land	0.1091	−0.0193	−0.0579	0.0032	0.0037	−0.0086	0.0018	0.0161*
	(0.1136)	(0.0825)	(0.0843)	(0.0061)	(0.0053)	(0.0061)	(0.0045)	(0.0097)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	5.2382	1.8836	1.9689	−0.4542***	0.3408***	0.9412***	0.1722***	7.3992***
	(3.9408)	(2.8643)	(2.9246)	(0.0446)	(0.0388)	(0.0452)	(0.0331)	(0.0716)
Observations	11,121	11,121	11,121	21,558	21,558	21,558	21,558	21,558
R-squared	0.265	0.241	0.277	0.599	0.327	0.440	0.420	0.769

Notes: Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The full regression results are reported in Tab. 8 in the Annex. Source: Estimation from VHLSS 2002, 2004, 2008 and 2014.

Tab. 4: Regression of household-level dependent variables on joint titling of residential land

Explanatory variables	Log of formal credit (thousand VND)	Log of informal credit (thousand VND)	Log of micro-credit (thousand VND)	Share of farm income in household total income	Share of non-farm income in household total income	Share of wage income in household total income	Share of income from other sources in household total income	Log of per capita expenditure
Joint titling in residential land	0.3008***	0.1733**	−0.0843	0.0041	0.0177**	−0.0153	−0.0064	0.0247**
	(0.1062)	(0.0799)	(0.0798)	(0.0074)	(0.0090)	(0.0101)	(0.0062)	(0.0122)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	6.8456***	1.1266	1.1375*	0.0780	−0.0140	0.8563***	0.0797	8.5186***
	(1.2965)	(0.9931)	(0.6846)	(0.2322)	(0.0893)	(0.2233)	(0.0706)	(0.6145)
Observations	9,648	9,648	9,648	9,648	9,648	9,648	9,648	9,648
R-squared	0.255	0.227	0.261	0.542	0.289	0.387	0.379	0.796

Notes: Robust standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. The full regression results are reported in Tab. 8 in the Annex. Source: Estimation from VHLSS 2002, 2004, 2008 and 2014.

residential land increase per capita expenditure by 1.6 percent and 2.5 percent, respectively.

Notably, although the regression method controls for observed variables, including district dummies, it can be biased if households with dissimilar LURC tiling statuses are found to be different in not only observed but also unobserved characteristics. Without randomization of LURCs, it is challenging to estimate the causal effect of LURCs. Thus, the findings from the impact evaluation should be interpreted with discretion.

5 CONCLUSIONS AND POLICY RECOMMENDATIONS

Provision of joint land title for both men and women is important to ensure gender equality. In Vietnam, the 2003 Land Law requires joint-titled LURCs for married couples. As a result, there has been a remarkable increase in the joint-titled LURCs since 2004. For instance, the proportion of joint-titled LURCs of annual cropland increased from 11.6 percent in 2004 to 38.3 percent in 2014. The proportion of joint-titled LURCs of other agricultural land and residential land also increased significantly.

Using the 2004 and 2014 VHLSSs and district fixed-effect regression, we find several positive effect of joint-titled LURCs. The most direct effect of LURCs is on the access to credit. We find that joint-titled LURCs increased the amount of formal credit by 35.1 percent and informal credit by 18.9 percent. This finding is consistent with qualitative study from World Bank (2008), which shows that LURCs can help households to be more likely to borrow and also help women feel more confidence

in decision-making process. Compared with previous quantitative studies, our study is one of the first attempt which find a positive effect of joint land titling on credit.

The increase in credit is translated into an expansion of nonfarm production, resulting in an increase in the share of nonfarm income of households with joint-titled LURCs. As a result, consumption is increased. We find that joint-titled LURCs of agricultural land and residential land increases per capita expenditure of households by 1.6 percent and 2.5 percent, respectively. The positive effect of joint land titling is also found in Menon et al. (2017). Thus, together with Menon et al. (2017), our study provides the supportive evidence for the hypothesis that joint land titling can improve the living standards of households.

Our study suggests several policy implications. The Government should have policies to re-issue single-titled LURCs as joint-titled LURCs. Even for LURCs that are provided to households under the name of households should be revised. Not only household heads but also their spouses should be named on LURCs. To further gain the benefits from joint land titling, there is an opportunity to enhance joint-titled LURCs. It is important to strengthen communication and the enforcement of women's land rights, especially in rural and remote areas with high concentration of ethnic minority groups. The provincial authorities should incorporate tasks of raising awareness of women's land rights and benefits of joint titling in communication programs of local mass organizations, such as the Farmers' Association, the Youths' Union, and notably the Women's Union. Content should be provided in local language and should not only refer to the Land Law but to other related laws such as the Inheritance Law and the Law on Marriage and Families. Provincial authorities should provide assistance in the preparation of paperwork needed for obtaining joint-titled LURCs.

Finally, it should be noted that there is a limitation in estimation method in our study. Although we are seeking to estimate the causal effect of joint land titling, we are fully aware of selection bias. Households with and those without joint-titled LURCs can differ for unobserved variables such as cultural, legislation or linguistic factors. Although we tried to control for a large number of observed variables and district dummies, these unobserved variables might still cause biases. Thus the causal effect of joint land titling in this study should be interpreted with caution. Solving the selection bias requires better methods such as randomized control trials. Addressing this problem is out of scope of our study, but certainly important for the future study.

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7 REFERENCES

Agarwal, B. 1994. Gender and Command Over Property: A Critical Gap in Economic Analysis and Policy in South Asia. *World Development*, 22 (10), 1455–1478. DOI: 10.1016/0305-750X(94)90031-0.

Appiah, E. N. and McMahon, W. W. 2002. The Social Outcomes of Education and Feedbacks on Growth in Africa. *Journal of Development Studies*, 38 (4), 27–68. DOI: 10.1080/00220380412331322411.

Bertay, A. C., Đorđević, L. and Sever, C. 2020. *Gender Inequality and Economic Growth: Evidence from Industry-Level Data*. International Monetary Fund, 2020.

Campus, D. 2016. *Does Land Titling Promote Women's Empowerment? Evidence from Nepal*. Working Paper. Università degli Studi di Firenze, Italy. DOI: 10.13140/RG.2.2.14264.96004.

Cherchi, L., Goldstein, M., Habyarimana, J., Montalvao, J., O'Sullivan, M., Udry, C. and Gruver, A. 2019. *Empowering Women Through Equal Land Rights: Experimental Evidence from Rural Uganda*. Gender Innovation Lab Policy Brief, No. 33. World Bank, Washington, DC.

Chigbu, U. E. 2019. Masculinity, Men and Patriarchal Issues Aside: How Do Women's Actions Impede Women's Access to Land? Matters Arising from a Peri-Rural Community in Nigeria. *Land Use Policy*, 81, 39–48. DOI: 10.1016/j.landusepol.2018.10.033.

Datta, N. 2006. Joint Titling – A Win-Win Policy? Gender and Property Rights in Urban Informal Settlements in Chandigarh, India. *Feminist Economics*, 12 (1–2), 271–298. DOI: 10.1080/13545700500508569.

Deere, C. D. and León, M. 2022. Consensual Unions, Property Rights, and Patrimonial Violence against Women in Latin America. *Social Politics: International Studies in Gender, State & Society*, 29 (2), 608–633. DOI: 10.1093/sp/jxab001.

Diebolt, C. and Perrin, F. 2013. From Stagnation to Sustained Growth: The Role of Female Empowerment. *American Economic Review*, 103 (3), 545–549. DOI: 10.1257/aer.103.3.545.

Do, T. B. and Hoang, T. S. 2005. Land Management and Using by Women in Ethnic Minority Group of Co Tu. *Women's Studies Journal*, 71 (4), 28–35.

Duflo, E. 2012. Women Empowerment and Economic Development. *Journal of Economic Literature*, 50 (4), 1051–79. DOI: 10.1257/jel.50.4.1051.

Eswaran, M. 2014. *Why Gender Matters in Economics*. Princeton, NJ: Princeton University Press.

Field, E. 2007. Entitled to Work: Urban Property Rights and Labor Supply in Peru. *Quarterly Journal of Economics*, 122 (4), 1561-1602.DOI: 10.1162/qjec.2007.122.4.1561.

Greig, F., Weeks, J. R. and Nguyen, T. T. 2006. *Women Business Owners in Vietnam: A National Survey*. Private Sector Discussion Papers Series, No. 21. Washington, DC: World Bank Group.

Grown, C., Addison, T. and Tarp, F. 2016. Aid for Gender Equality and Development: Lessons and Challenges. *Journal of International Development*, 28 (3), 311–319. DOI: 10.1002/jid.3211.

Grown, C., Rao Gupta, G. and Kes, A. 2005. *Taking Action: Achieving Gender Equality and Empowering Women*. UN Millennium Project. Task Force on Education and Gender Equality.

GSO (General Statistics Office). 2010. *Results from the National Study on Domestic Violence Against Women in Viet Nam*. General Statistics Office of Vietnam. Hanoi, Vietnam.

Izumi, K. 2007. Gender-based Violence and Property Grabbing in Africa: A Denial of Women's Liberty and Security. *Gender & Development*, 15 (1), 11–23. DOI: 10.1080/13552070601178823.

Khandker, S. R. 2005. Microfinance and Poverty: Evidence Using Panel Data from Bangladesh. *The World Bank Economic Review*, 19 (2), 263–286. DOI: 10.1093/wber/lhi008.

Lensink, R. and Pham, T. T. T. 2012. The Impact of Microcredit on Self-Employment Profits in Vietnam. *Economics of Transition*, 20 (1), 73–111. DOI: 10.1111/j.1468-0351.2011.00427.x.

Meinzen-Dick, R. S., Quisumbing, A. R., Doss, C. R. and Theis, S. 2019. Women's Land Rights as a Pathway to Poverty Reduction: Framework and Review of Available Evidence. *Agricultural Systems*, 172 (C), 72–82. DOI: 10.1016/j.agsy.2017.10.009.

Menon, N., Rodgers, Y. and Kennedy, A. R. 2017. Land Reform and Welfare in Vietnam: Why Gender of the Land-Rights Holder Matters. *Journal of International Development*, 29 (4), 454–472, DOI: 10.1002/jid.3203.

Newman, C., Tarp, F. and van den Broeck, K. 2015. Property Rights and Productivity: The Case of Joint Land Titling in Vietnam. *Land Economics*, 91 (1), 91–105. DOI: 10.3368/le.91.1.91.

Nguyen, C. 2008. Is a Governmental Micro-Credit Program for the Poor Really Pro-Poor? Evidence from Vietnam. *The Developing Economies*, 46 (2), 151–187. DOI: 10.1111/j.1746-1049.2008.00061.x.

Nguyen, C. and Tran, A. 2017. The Effect of Having Children on Women's Marital Status: Evidence from Vietnam. *The Journal of Development Studies*, 53 (12), 2102–2117. DOI: 10.1080/00220388.2016.1269887.

Nguyen, C. and van den Berg, M. 2014. Informal Credit, Usury, or Support? A Case Study for Vietnam. *The Developing Economies*, 52 (2), 154–178. DOI: 10.1111/deve.12042.

Nguyen, N. T. 1999. *An Investigation on Female-Mastered Households and Land Using in Ethnic Minorities*. Hanoi, Vietnam.

Rao, N. 2005. Gender Equality, Land Rights and Household Food Security: Discussion of Rice Farming Systems. *Economic and Political Weekly*, 40 (25), 2513–2521. DOI: 10.2307/4416780.

Razavi, S. 2003. Introduction: Agrarian Change, Gender and Land Rights. *Journal of Agrarian Change*, 3 (1–2), 2–32. DOI: 10.1111/1471-0366.00049.

Roy, K. C. and Tisdell, C. A. 2002. Property Rights in Women's Empowerment in Rural India: A Review. *International Journal of Social Economics*, 29 (4), 315–334. DOI: 10.1108/03068290210419870.

Roy, S. 2015. Empowering Women? Inheritance Rights, Female Education and Dowry Payments in India. *Journal of Development Economics*, 114 (C), 233–251. DOI: 10.1016/j.jdeveco.2014.12.010.

Sharma, S. and Tarp, F. 2018. Female Autonomy and Women's Welfare: An Introduction. *Review of Development Economics*, 22 (4), 1385–1389. DOI: 10.1111/rode.12542.

Swain, R. B., Tuan, V. V. and Sanh, N. V. 2008. Microfinance and Poverty Reduction in the Mekong Delta in Vietnam. *African and Asian Studies*, 7 (2–3), 191–215. DOI: 10.1163/156921008X318736.

Tinker, I. and Summerfield, G. (eds.). 1999. *Women's Rights to House and Land: China, Laos, and Vietnam*. Boulder, Colorado: Lynne Rienner Publishers.

United Nations. 2008. Fighting Climate Change: Human Solidarity in a Divided World. In *Human Development Report 2007/2008*, Chapter 1, pp. 1–18. DOI: 10.1057/9780230598508_1.

van Rooyen, C., Stewart, R. and de Wet, T. 2012. The Impact of Microfinance in Sub-Saharan Africa: A Systematic Review of the Evidence. *World Development*, 40 (11), 2249–2262. DOI: 10.1016/j.worlddev.2012.03.012.

Widman, M. and Hart, R. 2019. Joint Land Titling and Household Bargaining in Madagascar. *Feminist Economics*, 25 (4), 211–239. DOI: 10.1080/13545701.2019.1665195.

Wiig, H. 2013. Joint Titling in Rural Peru: Impact on Women's Participation in Household Decision-Making. *World Development*, 52 (C), 104–119. DOI: 10.1016/j.worlddev.2013.06.005.

World Bank. 2008. *Analysis of the Impact of Land Tenure Certificates with Both the Names of Wife and Husband in Vietnam* [online]. Washington, DC: World Bank. Available at: `http://documents.worldbank.org/curated/en/215551468329364648/Analysis-of-the-impact-of-land-tenure-certificates-with-both-the-names-of-wife-and-husband-in-Vietnam`.

8 ANNEX

Tab. 5: Household welfare indicators by LURCs of agricultural lands in 2014 (estimation from VHLSS 2014)

Household welfare indicators	No LURCs	LURCs with only male	LURCs with joint titling	LURCs with only female	Total
Loan from formal bank (thousand VND)	4433.2	3884.7	6428.8	7089.5	5017.7
Loan from informal sources (thousand VND)	1184.3	792.2	845.8	2143.7	982.3
Loan from Bank for Social Policies (thousand VND)	1475.0	1322.6	1434.3	1501.0	1415.5
Share of farm income in total income (%)	37.9	41.6	44.1	31.8	40.9
Share of nonfarm income in total income (%)	14.3	12.6	11.3	14.2	12.8
Share of wages in total income (%)	36.5	33.1	32.8	42.7	34.4
Share of other income in total income (%)	11.3	12.7	11.8	11.3	11.9
Real per capita expenditure (thousand VND)	7188.0	8007.5	8510.1	8676.2	7929.4
Poverty rate (%)	21.2	14.9	14.2	10.1	16.6

Tab. 6: Household welfare indicators by LURCs of residential lands (estimation from VHLSS 2014)

Household welfare indicators	No LURCs	LURCs with only male	LURCs with joint titling	LURCs with only female	Total
Loan from formal bank (thousand VND)	2551.3	4085.6	6651.2	5941.8	4868.8
Loan from informal sources (thousand VND)	1215.3	813.0	1170.6	1742.9	1100.6
Loan from Bank for Social Policies (thousand VND)	1260.2	1097.0	936.2	854.0	1059.3
Share of farm income in total income (%)	27.6	30.8	25.9	12.7	27.2
Share of nonfarm income in total income (%)	17.1	15.8	18.8	22.4	17.7
Share of wages in total income (%)	45.4	39.9	42.8	52.9	43.0
Share of other income in total income (%)	9.8	13.6	12.5	12.0	12.1
Real per capita income (thousand VND)	9264.3	10397.1	11870.1	13350.0	10861.0
Real per capita expenditure (thousand VND)	8484.5	9291.7	11107.0	11202.4	9938.3
Poverty rate (%)	18.6	12.0	9.2	5.4	12.2

Tab. 7: OLS regression of land titling

Explanatory variables	Dependent variable is 'land plot with titling' (estimated using the full sample of land plots)			Dependent variable is 'land plot with joint titling' (estimated using the sample of land plots in households with married household heads)		
	All land plots	Agricultural land plot	Residential land plot	All land plots	Agricultural land plot	Residential land plot
Annual crop land (yes = 1, no = 0)	Reference					
Perennial crop land (yes = 1, no = 0)	0.0366**	0.0209		0.0222	0.0023	
	(0.0161)	(0.0163)		(0.0213)	(0.0231)	
Forestry land (yes = 1, no = 0)	−0.0707***	0.0102		−0.0712**	−0.1140***	
	(0.0224)	(0.0235)		(0.0284)	(0.0297)	
Aquaculture surface (yes = 1, no = 0)	−0.1425***	−0.1570***		0.0477	0.0410	
	(0.0244)	(0.0233)		(0.0342)	(0.0347)	
Residential land (yes = 1, no = 0)	0.0875***			0.1106***		
	(0.0114)			(0.0158)		
Ethnic minorities (yes = 1, Kinh = 0)	−0.0213	0.0108	−0.0644***	0.0709*	0.0863**	0.0144
	(0.0213)	(0.0248)	(0.0214)	(0.0367)	(0.0434)	(0.0319)
Gender of household head (male = 1, female = 0)	0.0077	−0.0013	0.0073	0.0506*	0.0454	0.0566**
	(0.0125)	(0.0179)	(0.0126)	(0.0282)	(0.0448)	(0.0253)
Age of household head	0.0234***	0.0236***	0.0207***	−0.0090	−0.0131*	−0.0020
	(0.0027)	(0.0037)	(0.0028)	(0.0056)	(0.0076)	(0.0051)
Age of household head squared	−0.0002***	−0.0002***	−0.0001***	0.0001*	0.0001*	0.0000
	(0.0000)	(0.0000)	(0.0000)	(0.0001)	(0.0001)	(0.0000)
Head with less than primary education	Reference					
Head with primary education	0.0453***	0.0412**	0.0471***	−0.0099	−0.0021	−0.0231
	(0.0152)	(0.0194)	(0.0152)	(0.0277)	(0.0342)	(0.0247)
Head with lower-secondary education	0.0428***	0.0320	0.0584***	0.0035	0.0272	−0.0305
	(0.0156)	(0.0201)	(0.0162)	(0.0292)	(0.0362)	(0.0258)
Head with upper-secondary education	0.0438*	0.0425	0.0555**	−0.0228	−0.0174	−0.0295
	(0.0225)	(0.0309)	(0.0217)	(0.0381)	(0.0490)	(0.0333)
Head with technical degree	0.0289	−0.0064	0.0789***	−0.0143	−0.0273	−0.0164
	(0.0210)	(0.0299)	(0.0208)	(0.0384)	(0.0529)	(0.0321)
Head with post-secondary education	0.0829***	0.0342	0.1206***	0.0622	0.0902	0.0255
	(0.0249)	(0.0488)	(0.0232)	(0.0451)	(0.0837)	(0.0369)
Log of per capita expenditure	0.0671***	0.0688***	0.0534***	0.0506**	0.0580**	0.0361*
	(0.0117)	(0.0165)	(0.0107)	(0.0200)	(0.0272)	(0.0187)
Proportion of older people in household	0.0378	0.0053	0.0694***	−0.1483***	−0.1897***	−0.0817*
	(0.0252)	(0.0347)	(0.0243)	(0.0503)	(0.0642)	(0.0462)
Proportion of children in household	−0.2166***	−0.2626***	−0.1495***	0.0836	0.0896	0.0631
	(0.0358)	(0.0482)	(0.0347)	(0.0603)	(0.0794)	(0.0541)
Household size	0.0283***	0.0269***	0.0295***	−0.0082	−0.0085	−0.0067
	(0.0040)	(0.0052)	(0.0039)	(0.0071)	(0.0088)	(0.0064)
Log of land areas	0.0018	−0.0437***	0.0520***	0.0250***	0.0414***	−0.0160*
	(0.0039)	(0.0053)	(0.0056)	(0.0059)	(0.0086)	(0.0088)
Urban areas (urban = 1, rural = 0)	−0.0350**	−0.0151	−0.0106	0.0428*	−0.0077	0.0429*
	(0.0146)	(0.0245)	(0.0148)	(0.0258)	(0.0416)	(0.0236)
Red River Delta	Reference					
North East	0.1963***	0.2371***	0.0891***	−0.0432	−0.0195	−0.0853**
	(0.0212)	(0.0266)	(0.0191)	(0.0396)	(0.0476)	(0.0333)
North West	0.1263***	0.1958***	0.0015	−0.2334***	−0.2422***	−0.1921***
	(0.0349)	(0.0396)	(0.0350)	(0.0562)	(0.0640)	(0.0529)
North Central Coast	0.0741***	0.0973***	0.0452**	0.0940**	0.1010**	0.0928***
	(0.0239)	(0.0318)	(0.0207)	(0.0391)	(0.0505)	(0.0330)
South Central Coast	0.0854***	0.1482***	−0.0079	−0.0246	−0.0362	0.0032
	(0.0236)	(0.0300)	(0.0225)	(0.0389)	(0.0498)	(0.0337)
Central Highlands	0.0516*	0.1281***	0.0228	0.1842***	0.1925***	0.1787***
	(0.0273)	(0.0373)	(0.0266)	(0.0396)	(0.0557)	(0.0359)
Southeast	0.0700***	0.2623***	−0.0020	0.0044	0.0399	−0.0467
	(0.0220)	(0.0359)	(0.0233)	(0.0367)	(0.0612)	(0.0362)
Mekong River Delta	0.1381***	0.3484***	−0.0023	−0.1891***	−0.1901***	−0.2213***
	(0.0177)	(0.0255)	(0.0183)	(0.0319)	(0.0444)	(0.0291)
Constant	−0.9371***	−0.6820***	−0.8630***	−0.0113	−0.0991	0.3165
	(0.1382)	(0.1905)	(0.1369)	(0.2535)	(0.3460)	(0.2359)
Observations	24,811	15,963	8,848	14,543	9,153	5,390
R-squared	0.100	0.122	0.103	0.064	0.064	0.060

Note: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Tab. 8: Regression of household-level dependent variables on joint-titled LURCs of agricultural land

Explanatory variables	Log of formal credit (thousand VND)	Log of informal credit (thousand VND)	Log of micro-credit (thousand VND)	Share of farm income in household total income	Share of non-farm income in household total income	Share of wage income in household total income	Share of income from other sources in household total income	Log of per capita expenditure
Joint titling in agricultural land	0.1091	−0.0193	−0.0579	0.0032	0.0037	−0.0086	0.0018	0.0161*
	(0.1136)	(0.0825)	(0.0843)	(0.0061)	(0.0053)	(0.0061)	(0.0045)	(0.0097)
Household head is male	0.2782	−0.2076	−0.1168	0.0548***	0.0203***	−0.0481***	−0.0271***	−0.0136
	(0.1784)	(0.1297)	(0.1324)	(0.0075)	(0.0065)	(0.0076)	(0.0056)	(0.0120)
Age of household head	0.0048	−0.0657***	0.0125	0.0031***	−0.0020**	−0.0052***	0.0041***	0.0112***
	(0.0264)	(0.0192)	(0.0196)	(0.0010)	(0.0009)	(0.0011)	(0.0008)	(0.0017)
Squared age of household head	−0.0001	0.0005***	−0.0002	−0.0000***	0.0000	0.0000***	−0.0000	−0.0001***
	(0.0003)	(0.0002)	(0.0002)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Household head is married	−5.5814	1.9514	0.1047	0.0040	0.0122	−0.0131	−0.0032	−0.0132
	(3.8593)	(2.8051)	(2.8642)	(0.0326)	(0.0284)	(0.0330)	(0.0242)	(0.0523)
Head with less than primary education	Reference							
Head with primary education	−0.0002	−0.0593	−0.0807	−0.0162***	0.0131***	−0.0047	0.0078**	0.0935***
	(0.1198)	(0.0871)	(0.0889)	(0.0050)	(0.0043)	(0.0050)	(0.0037)	(0.0080)
Head with lower-secondary education	0.0738	−0.1305	0.0651	−0.0348***	0.0171***	0.0062	0.0114***	0.1559***
	(0.1350)	(0.0982)	(0.1002)	(0.0056)	(0.0049)	(0.0057)	(0.0042)	(0.0090)
Head with upper-secondary education	0.3414*	−0.0800	−0.0347	−0.0632***	0.0353***	0.0101	0.0178***	0.2220***
	(0.1864)	(0.1355)	(0.1383)	(0.0078)	(0.0068)	(0.0079)	(0.0058)	(0.0125)
Head with technical degree	0.5682***	−0.3746***	0.1009	−0.1220***	0.0336***	0.0451***	0.0433***	0.3030***
	(0.1827)	(0.1328)	(0.1356)	(0.0082)	(0.0072)	(0.0084)	(0.0061)	(0.0132)
Head with post-secondary education	0.2136	0.0666	−0.2760	−0.1531***	−0.0290**	0.1437***	0.0384***	0.4232***
	(0.3190)	(0.2318)	(0.2367)	(0.0141)	(0.0122)	(0.0142)	(0.0104)	(0.0226)
Spouse with less than primary education	Reference							
Spouse with primary education	−0.0761	−0.0771	−0.0269	−0.0093*	0.0097**	−0.0093*	0.0089**	0.0617***
	(0.1170)	(0.0850)	(0.0868)	(0.0049)	(0.0043)	(0.0050)	(0.0037)	(0.0079)
Spouse with lower-secondary education	0.0201	−0.0667	−0.1529	−0.0079	0.0193***	−0.0138**	0.0023	0.1095***
	(0.1392)	(0.1012)	(0.1033)	(0.0059)	(0.0051)	(0.0059)	(0.0044)	(0.0094)
Spouse with upper-secondary education	0.0774	−0.2065	−0.1707	−0.0356***	0.0435***	−0.0083	0.0004	0.1737***
	(0.2148)	(0.1561)	(0.1594)	(0.0089)	(0.0078)	(0.0090)	(0.0066)	(0.0143)
Spouse with technical degree	0.2002	−0.3578**	−0.3499**	−0.1346***	−0.0020	0.1208***	0.0157**	0.3081***
	(0.2307)	(0.1677)	(0.1712)	(0.0102)	(0.0089)	(0.0103)	(0.0076)	(0.0164)
Spouse with post-secondary education	0.5688	−0.2904	−1.1611***	−0.1590***	−0.0568***	0.2367***	−0.0209*	0.4569***
	(0.3530)	(0.2566)	(0.2620)	(0.0156)	(0.0136)	(0.0158)	(0.0115)	(0.0250)
Urban area	−0.2825*	−0.1002	−0.2873**	−0.0759***	0.0737***	0.0077	−0.0055	0.0873***
	(0.1678)	(0.1219)	(0.1245)	(0.0094)	(0.0082)	(0.0096)	(0.0070)	(0.0152)
Ethnic minorities	−0.3600**	−0.2039	0.3192**	0.0339***	−0.0462***	0.0068	0.0055	−0.2338***
	(0.1824)	(0.1326)	(0.1354)	(0.0086)	(0.0075)	(0.0087)	(0.0064)	(0.0138)
Household size	0.1059***	0.0651***	0.0179	−0.0210***	0.0084***	0.0273***	−0.0147***	−0.0720***
	(0.0296)	(0.0215)	(0.0220)	(0.0012)	(0.0011)	(0.0012)	(0.0009)	(0.0020)
Proportion of children below 15	−0.1373	−0.1761	−0.0085	0.0925***	−0.0128	−0.1001***	0.0203**	−0.5185***
	(0.2626)	(0.1909)	(0.1949)	(0.0108)	(0.0094)	(0.0110)	(0.0080)	(0.0174)
Proportion of people above 60	−0.9013***	−0.5059***	−0.6851***	0.0321***	−0.0281***	−0.1774***	0.1735***	−0.1398***
	(0.2585)	(0.1879)	(0.1918)	(0.0112)	(0.0098)	(0.0114)	(0.0083)	(0.0180)
Log of agricultural land areas	0.2341***	−0.0692**	−0.0974***	0.1243***	−0.0298***	−0.0749***	−0.0197***	0.0779***
	(0.0455)	(0.0330)	(0.0337)	(0.0020)	(0.0018)	(0.0020)	(0.0015)	(0.0032)
Constant	5.2382	1.8836	1.9689	−0.4542***	0.3408***	0.9412***	0.1722***	7.3992***
	(3.9408)	(2.8643)	(2.9246)	(0.0446)	(0.0388)	(0.0452)	(0.0331)	(0.0716)
Observations	11,121	11,121	11,121	21,558	21,558	21,558	21,558	21,558
R-squared	0.265	0.241	0.277	0.599	0.327	0.440	0.420	0.769

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: Estimation from VHLSS 2002, 2004, 2008 and 2014.

Tab. 9: Regression of household-level dependent variables on joint-titled LURCs of residential land

Explanatory variables	Log of formal credit (thousand VND)	Log of informal credit (thousand VND)	Log of micro-credit (thousand VND)	Share of farm income in household total income	Share of non-farm income in household total income	Share of wage income in household total income	Share of income from other sources in household total income	Log of per capita expenditure
Joint titling in residential land	0.3008*** (0.1062)	0.1733** (0.0799)	−0.0843 (0.0798)	0.0041 (0.0074)	0.0177** (0.0090)	−0.0153 (0.0101)	−0.0064 (0.0062)	0.0247** (0.0122)
Household head is male	0.0734 (0.1366)	−0.0855 (0.1086)	−0.0807 (0.0912)	0.0467*** (0.0082)	0.0095 (0.0130)	−0.0421*** (0.0140)	−0.0141* (0.0078)	−0.0015 (0.0169)
Age of household head	−0.0029 (0.0251)	−0.0315* (0.0167)	0.0081 (0.0186)	0.0057*** (0.0019)	0.0006 (0.0020)	−0.0074*** (0.0023)	0.0011 (0.0017)	0.0078*** (0.0030)
Squared age of household head	−0.0000 (0.0002)	0.0001 (0.0001)	−0.0001 (0.0002)	−0.0001*** (0.0000)	−0.0000 (0.0000)	0.0001*** (0.0000)	0.0000 (0.0000)	−0.0001* (0.0000)
Household head is married	−6.2921*** (1.0541)	1.3148 (0.8396)	0.3746 (0.3952)	−0.1356 (0.2257)	0.3344*** (0.0674)	−0.2418 (0.2128)	0.0431 (0.0557)	−0.2400 (0.6086)
Head with less than primary education	Reference							
Head with primary education	0.0698 (0.1353)	-0.2304** (0.0978)	-0.1090 (0.1030)	-0.0101 (0.0104)	0.0371*** (0.0097)	-0.0156 (0.0112)	-0.0113 (0.0075)	0.0888*** (0.0145)
Head with lower-secondary education	0.0129 (0.1500)	-0.3143*** (0.1115)	-0.0452 (0.1170)	-0.0259** (0.0111)	0.0285** (0.0113)	0.0036 (0.0127)	-0.0062 (0.0082)	0.1563*** (0.0162)
Head with upper-secondary education	0.1435 (0.1874)	-0.1746 (0.1470)	-0.1978 (0.1356)	-0.0651*** (0.0134)	0.0602*** (0.0164)	-0.0028 (0.0173)	0.0078 (0.0108)	0.2671*** (0.0209)
Head with technical degree	0.1594 (0.1874)	-0.3738*** (0.1414)	0.0825 (0.1388)	-0.1228*** (0.0125)	0.0426*** (0.0145)	0.0941*** (0.0163)	-0.0139 (0.0106)	0.3026*** (0.0204)
Head with post-secondary education	0.0930 (0.2270)	-0.3594** (0.1711)	-0.2499* (0.1475)	-0.1081*** (0.0142)	-0.0761*** (0.0184)	0.2233*** (0.0206)	-0.0392*** (0.0127)	0.4261*** (0.0265)
Spouse with less than primary education	Reference							
Spouse with primary education	−0.1221 (0.1316)	0.0357 (0.0936)	−0.0376 (0.0999)	0.0037 (0.0097)	0.0040 (0.0096)	−0.0022 (0.0109)	−0.0055 (0.0072)	0.0709*** (0.0144)
Spouse with lower-secondary education	−0.0736 (0.1525)	−0.0116 (0.1125)	−0.2536** (0.1154)	−0.0012 (0.0108)	0.0109 (0.0117)	−0.0039 (0.0130)	−0.0058 (0.0083)	0.1147*** (0.0168)
Spouse with upper-secondary education	0.0972 (0.2063)	−0.2321 (0.1535)	−0.2219 (0.1487)	−0.0366*** (0.0135)	0.0464** (0.0182)	−0.0081 (0.0191)	−0.0017 (0.0112)	0.1992*** (0.0237)
Spouse with technical degree	−0.0521 (0.2060)	−0.1378 (0.1696)	−0.4710*** (0.1565)	−0.0876*** (0.0130)	−0.0321* (0.0171)	0.1329*** (0.0190)	−0.0133 (0.0123)	0.2929*** (0.0240)
Spouse with post-secondary education	0.0262 (0.2450)	−0.3804** (0.1812)	−0.6853*** (0.1550)	−0.0902*** (0.0141)	−0.0899*** (0.0199)	0.1967*** (0.0225)	−0.0166 (0.0133)	0.3861*** (0.0290)
Urban area	−0.1945 (0.1530)	0.0449 (0.1000)	−0.3831*** (0.1002)	−0.1527*** (0.0103)	0.1357*** (0.0125)	0.0027 (0.0130)	0.0143* (0.0077)	0.1336*** (0.0162)
Ethnic minorities	−0.5204** (0.2205)	−0.2522* (0.1517)	0.4266** (0.1731)	0.0938*** (0.0152)	−0.0962*** (0.0134)	−0.0046 (0.0159)	0.0070 (0.0094)	−0.2845*** (0.0219)
Household size	0.1292*** (0.0328)	0.0397* (0.0238)	0.0273 (0.0234)	−0.0081*** (0.0022)	−0.0004 (0.0024)	0.0321*** (0.0028)	−0.0237*** (0.0018)	−0.0746*** (0.0036)
Proportion of children below 15	−0.2853 (0.2750)	0.0643 (0.2120)	−0.2289 (0.2052)	0.0469** (0.0189)	0.0285 (0.0224)	−0.0958*** (0.0245)	0.0204 (0.0147)	−0.4972*** (0.0306)
Proportion of people above 60	−0.9904*** (0.2293)	−0.1081 (0.1492)	−0.5499*** (0.1667)	−0.0111 (0.0194)	−0.0382** (0.0190)	−0.1364*** (0.0219)	0.1856*** (0.0193)	−0.2345*** (0.0308)
Log of residential land areas	0.1866*** (0.0490)	−0.0320 (0.0346)	−0.0274 (0.0336)	0.0590*** (0.0034)	−0.0301*** (0.0038)	−0.0291*** (0.0041)	0.0002 (0.0025)	0.0516*** (0.0055)
Constant	6.8456*** (1.2965)	1.1266 (0.9931)	1.1375* (0.6846)	0.0780 (0.2322)	−0.0140 (0.0893)	0.8563*** (0.2233)	0.0797 (0.0706)	8.5186*** (0.6145)
Observations	9,648	9,648	9,648	9,648	9,648	9,648	9,648	9,648
R-squared	0.255	0.227	0.261	0.542	0.289	0.387	0.379	0.796

Notes: Robust standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: Estimation from VHLSS 2004 and 2014.

AUTHOR'S ADDRESS

Cuong Viet Nguyen, International School, Vietnam National University, Hanoi, Vietnam; Thang Long Institute of Mathematics and Applied Sciences (TIMAS), Thang Long University, Hanoi, Vietnam; e-mail: cuongwur@gmail.com