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LAND OWNERSHIP AND INFORMAL CREDIT IN RURAL VIETNAM

Matteo Migheli

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Matteo Migheli[a,b]

Abstract

Access to credit and its cost is a major challenge for farmers in developing countries. Several studies show that land serves as collateral for accessing formal credit, but they often do not find any significant effect of land size on access to informal credit. I study the effects of land ownership on both the demand and the cost of informal credit in the Mekong Delta. The results show that as land ownership increases, both the demand and the cost of informal loans decrease. Design and implementation of appropriate land redistributions seems a fundamental way to fight the informal credit market.

Keywords: informal credit, cost of credit, rural Vietnam, Mekong Delta, land ownership

a University of Torino, Department of Economics and Statistics "Cognetti de Martiis", lungo Dora Siena, 100 I-10153 Torino, Italy. Tel. +390116709630, email: matteo.migheli@unito.it

b CeRP – Collegio Carlo Alberto, via Real Collegio, 30 I-10024 Moncalieri (TO), Italy.

1. Introduction

In most of the developing countries, credit rationing represents a major obstacle to growth and development (Duong and Izumida, 2002; Bond et al., 2015 and Luan et al., 2015). The lack of credit from formal institutions (i.e. banks, international organisations, microcredit programs, etc.) induces the economic agents that are rationed in the formal market to resort to informal sources of credit. Relatives and friends as well other moneylenders are included in this set of informal sources. However, the diffusion of these informal moneylenders is generally a concern: informal moneylenders may follow illegal procedures, for example charging usury interest rates. Indeed, also in the market of credit, the respect of legality are considered important conditions for economic development (Massenot and Straub, 2015).

The reasons why the economic agents in developing countries resort to informal credit have been widely studied and the next section of this paper provides the reader with a review of the most relevant literature on the issue. A major economic sector in the developing countries is agriculture. While informal credit is diffused also in urban areas and in the industrial sector (Nguyen and Luu, 2013), it characterises especially the countryside, where the commercial banks have less branches and the international organisations have less penetration. Moreover, in the developing countries, farms are in general small enterprises and farmers have more difficulties than industrial entrepreneurs to access formal credit. Understanding the mechanisms that induce economic agents to borrow from informal moneylenders is relevant to design policies aimed at reducing the phenomenon. In addition, the analysis of the link between credit and land ownership is particularly important in developing countries, as these were characterised by land reforms during the development process. These land reforms entailed the distribution of relatively small parcels (few hectares per household) to farmers. This transformation has generated several small agricultural enterprises, which started needing credit to finance the productive process.

In analysing access to formal and informal credit, a major variable of interest is represented by the collateral available to the borrower. In rural areas, land is the most common collateral; as the next section highlights, the extant literature shows that land generally constitutes a collateral for accessing formal credit, while informal moneylenders are likely not to ask for such a guarantee. However, the literature on the issue has considered basically only the extension of the land cultivated by the borrowers. Few articles include the ownership of land in the analyses. However, these studies do not consider the fact that farmers often do not own all the land that they cultivate, but rent some. This fact may have different consequences on both the access to credit and on its cost (i.e. the interest rate paid by the borrower to the lender). On the one hand, renters may have less collateral to provide and therefore may be more rationed and may pay higher costs than owners. On the other hand, farmers who rent some of the land that they cultivate may need less money for their activity.

Using data provided by the World Bank on a sample of farmers from the Mekong Delta, in this paper I inquiry the relationship that exists between land ownership on the one hand and access to informal credit and its cost on the other hand. Vietnam is an interesting country for the type of study presented in this paper, as land redistribution from collectives to farmers was one of the first and most relevant policies actuated within the *Doi Moi* process. Moreover, since the introduction of the *Doi Moi*¸ the Vietnamese economy has started a dual process, with a substantial reduction of the share of poor population (Luan et al., 2015), but with wages and living conditions improving much more in the urban than in the rural areas (Stampini and Davis, 2009 and Migheli, 2012). Differently from previous works, here land ownership is measured as the share of the land cultivated by a household that the household itself owns. In addition, the analyses control for several other variables, including the total extension of the land cultivated by the household and the different types of crops grown. Contrary to what the most of the literature has found so far, the results show

that land ownership has a significant impact on determining whether a household accesses informal credit or not; in addition, as the share of cultivated land increases, the interest rate paid on the loan decreases. These outcomes show that land somehow constitutes a collateral also for informal credit.

2. Related literature

In almost all the developing countries, dual credit markets exist: on the one side banks, international institutions and official NGOs lend money; on the other side credit in this formal market is often rationed, and consequently informal moneylenders represent a large share of the total credit supply (Manig, 1996 and Stampini and Davis, 2009). This is true even in countries – such as South Africa – where the formal financial sector is relatively well developed (Chisasa and Makina, 2012). Given that the credit market is characterised by asymmetric information, lenders usually ask the borrowers to provide collaterals, generally in the form of real assets. In rural areas, the most common type of collateral is land (Feder et al., 1988). Given that poor households are generally poor also of land, they are more rationed than the rich (Barham et al., 1996; Kochar, 1997 and Ibrahim and Aliero, 2012), especially in the formal market, where land constitutes the most important collateral (see for example Kochar, 1997 and Ssonko and Nakayaga, 2014)[1]. Not only formal credit requires more real assets as collateral and is more rationed than the informal, but it also tends to be much more expensive, as Giné (2011) shows, using Thai data. The same paper presents a theoretical model, which illustrates that the simultaneous presence of formal and informal lenders is optimal when small- and large-scale projects are to be financed at the same time. Similarly, Dalla Pellegrina (2011), Dehejia (2012) and Mookherjee and Motta (in press) highlight that, generally, the formal credit institutions (including microcredit financial institutions) lend money following

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[1] This is not always true: Feder et al. (1988) show that in Korea, land constitutes a collateral rather in the informal than in the formal market.

standardised procedures, which are not always optimal for small farms. Indeed, these may need

loans for non-standard durations, for example to face delayed harvests due to adverse

meteorological conditions[2]. Mallick (2012) confirms that formal credit is more expensive than the

informal, even though average interest rates are usually higher in the latter than in the former case

– this is also a consequence of the fact that some informal moneylenders borrow from banks and

then lend to farmers (Madestam, 2014)[3]. Indeed, bureaucratic procedures and the need of providing

collateral to formal lenders in the end render borrowing in the formal market more expensive than

resorting to the higher-interest loans supplied in the informal market.

With specific reference to Vietnam, Cuong (2008) highlights that the governmental programs

aimed at enhancing microcredit have positive impact on the reduction of poverty. However, they

also still entail too formal procedures with respect to informal credit, helping this last to survive and

to concentrate informal borrowing within the poor (indeed, Nguyen and van der Berg, 2014 provide

evidence of this). Always focusing on Vietnam, Barlsund and Tarp (2008) show that formal lenders

provide larger amounts and for longer time periods than informal lenders do. This is perhaps due to

the fact that, while the former require substantial collateral (including land), the latter do not. In

addition, the authors find that the extension of land owned by the borrower does not affect the

probability of resorting to informal credit, and has a negative and significant effect on the amount

borrowed. Khoi et al. (2013) confirm that also in Vietnam formal and informal credit are

complementary, and that the second represents a large share of the total credit market in rural

areas, in spite of large public subsidies to formal moneylenders.

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[2] Manin (1996) had already noted that the transaction costs are higher in the formal than in the informal credit market.
[3] Both Madestam (2014) claims and Nguyen and van der Berg (2014) show that informal moneylenders may be fund-constrained and therefore "obliged" to borrow in the formal market, to be able to satisfy the demand of the borrowers.

Land constitutes a major collateral in the formal market, and it is rarely required by informal moneylenders (Feder et al., 1988; Kochar, 1997; Barslund and Tarp, 2008 and Duy et al., 2012); however, some studies exist, which have inquired its importance also in the informal credit market (Ali et al., 2014). Guirkinger (2008) finds that as the size of the farm increases, so does the probability of accessing informal loans; on the one hand this result may simply witness that larger farms need more credit and therefore they borrow both in the formal and in the informal market. On the other side, this result does not exclude the possibility that, as the size of the farm increases, the household is less rationed also in the informal market. However, the author focuses on the total extension of the farm, without distinguishing between owned and rented land. For this reason, the first interpretation of her results – i.e. larger farms need larger loans – is the most tenable (indeed Dalla Pellegrina, 2011, shows that the larger the farm size, the larger the value of the working capital employed). Giné (2011) finds that land titling programs in Thailand have reduced the share of economic agents resorting to informal credit. The reason seems to be that land ownership allows farmers to go beyond the obstacle of credit rationing. Also Reyes and Lensink (2011) – using Chilean data – show that the more land a farmer owns, the lower his probability of be rationed in the formal credit market. Shoji et al. (2012) come to the same conclusions studying the credit market in Sri Lanka. Khoi et al. (2013) show that owning land (in the paper this is assessed by the means of a dummy equal to 1 if the household owns some land) has a positive and statistically significant influence on accessing informal credit in rural areas of the Mekong Delta region. The authors also find that formal and informal credit are complementary, as they serve different purposes: generally farmers finance the production using formal credit, while the informal supports the household's consumption (on this see also Mallick, 2012 and Nguyen and Berg, 2014). Also Ali et al. (2014) find that land reduces the probability of being credit-rationed in rural Rwanda. This suggest that land

may be offered as collateral also in the informal market, although there this practice is apparently less generalised than in the formal market.

Another dimension of credit, which affects household's financial conditions, and – more in general – rural development is the interest rate paid by the borrower. The works that study the relationship between the cost of credit and land ownership are much lesser than those linking land ownership and access to credit. Kochar (1997) finds a negative correlation between the extension of the land owned and the cost of formal credit. Mallick (2012) finds a complex relationship between the presence of MFIs and the interest rates paid to informal moneylenders. In addition, this author finds that, as the percentage of households with less than 10 decimals of land in a village increases, the interest rates charged by informal moneylenders tend to decrease. However, this result is not robust to different specifications of the estimated model[4].

With particular reference to Vietnam, Duong and Izumida (2002) show that households with more assets (in particular land) are less credit-rationed in the formal (and highly subsidised) credit market. Barslund et al. (2008) find the usual positive effect of cultivated land on the amount borrowed in the formal market. However, they also find a negative effect of the same variable on the amounts borrowed in the informal market (although the extension of the land cultivated by the household has no statistically significant impact on the probability of borrowing in this last market). The main reason behind this result seems to be that more land reduces rationing in the formal market and therefore reduces resorting to the informal. This result may also be explained by the large public subsidies present in Vietnam, which reduce the cost of formal credit.

All the works cited have studied the relevant issue of farm size and access to credit. However, they have not addressed another relevant issue: farmers are legally entitled to offer land as

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[4] Moreover, the author does not provide any interpretation of this result.

collateral, limited to the land they own. In other words, the lender cannot take rented land as collateral, as the borrower has no property right on that land. Consequently, what really matters is the land owned by the households that accesses the credit market. In the present paper I try to fill this gap.

3. Data and methodology

The data used in this paper are from the World Bank and cover a rural area in the Mekong Delta region (in the meridional part of Vietnam). A total of 2,412 households were interviewed; of these 603 reported full answers to the questionnaire and therefore the analysis conducted in this paper is limited to these households. While this sample size is limited, on average it is not very different from other studies on formal and informal lending in developing countries. Feder et al. (1988) is based on 316 observations from eight Thai provinces; Barham et al. (1996) analyse data for 189 households in Guatemala; Kochar's (1997) sample size is 2,415, but the country studied – India – is very large and diverse across regions; Duong and Izumida (2002) use data from 500 Vietnamese households; 449 are those used in Guirkinger (2008); Barslund and Taro (2008) use a dataset with 932 rural households in four different provinces of Vietnam; Dalla Pellegrina observes 1,798 households in Bangladesh; Wydick and Hayes (2011) analyse 465 Guatemalan farmers; Reyes and Lensink (2011) base their paper on 177 Chilean households; focusing on the Mekong Delta, Duy et al. (2012) present a study with 325 observations; 928 Vietnamese households form the sample used by Khoi et al. (2013).

The focus of the paper is on land ownership and its effects on accessing informal credit and on the interest rate paid by borrowers on it. In the survey used, this interest rate is reported on a monthly base. The percentage of land owned refers to the land cultivated by the household and the

surface used for residential purposes. This is included as a control for two reasons: first, it helps to proxy the household's wealth (other indicators of it are included and are discussed further in this section); second, it is part of the total land used by the household, which could borrow money also for residential improvements.

The percentage of cultivated land owned by the household is the main regressor of interest and different transformations of it have been included in the estimated models to find the best functional form that captures the largest share of variance as possible. After considering its simple "raw" value, its squared and cubic value and its logarithm, the last form has appeared to be the best to fit the data, and therefore the tables commented in this section and included in the paper consider the logarithm of the share of owned cultivated land. The result of the various trials just described is a first interesting result. It suggests that the relationship between the interest rate paid to informal lenders and the percentage of cultivated land owned is not linear, but such that the contribution of the share of land owned to the level of the interest rate is very large for small ownership shares, and then it decreases. In other terms, when the household owns a small fraction of the land cultivated, then small variations in this fraction have large effects on the interest rate requested by the lender; however, when this fraction is very large, the interest rate becomes much less sensitive to variations in the share of land owned. To test the robustness of the main results, different specifications of the model are estimated and presented. In the following of this section, I will present and comment all the variables included in all the specifications.

Another important set of variables captures the extension of cultivated (either owned or rented) land assigned to different crops: rice, other vegetables and orchards. The rationale for including these variable is twofold: on the one hand the total extension of land usable as a collateral is relevant to determine both the total amount of the credit that may be accessed and the riskiness of the borrower. On the other hand, as this land is used for growing different products, its value

may vary with the destination. In addition, in a region where the main crop is rice, paddies may be valued differently than land destined to other crops. Consequently, the inclusion of the land owned divided by use allows for a better representation of the collateral available to the farmer. A fourth category measures the share of land used to grow fishes (an important activity in the Mekong Delta). In addition, assuming that different crops and fishes are subject to different pests and are differently sensitive to meteorological events (i.e. assuming that the different productions are subject to partially uncorrelated risks), diversification may increase the financial stability of a household, reducing both the need of borrowing money and – for any given quantity borrowed – the interest rate paid.

Among the other controls is the amount of money borrowed both from formal and from informal lenders. The first allows to measure two aspects: on the one hand, it allows for capturing the total indebtedness of the household; this may increase the interest rate requested, as the debtor may have already pawned part of its land as collateral for the formal creditor, and this may decrease the solvability of the debtor. On the other hand, households who can access large amounts of formal credit may need informal borrowing less than the households who have more difficulties in accessing formal credit. Finally, there is an another possible aspect captured by the amount of formal credit: if a formal institution has lent large amounts to a household, this may entail a high degree of solvability and reliability of this household; this may have a negative effect on the interest rate required by the informal lender. The interest rate paid by the household on the amounts borrowed in the formal market is also included. This serves a couple of purposes: first, is measures the financial resources absorbed by the other lines of credit opened by the household. Second, it is a synthetic measure of how risky that household is perceived by formal lenders and helps to capture some possible variables affecting creditworthiness, which are not included in the dataset. In other words, it helps also to clean the results from the effect of possible relevant omitted variables.

The household's income is another important control. Instead of using total income, I use the disaggregation offered by the survey and include income from crops, income from remittances and in-kind income (transformed in dongs by the interviewer). Furthermore, also per-capita total income is included. Additional information about income comes from the number of the household's members, who work outside the farm. These people represent both an additional source of income and a way to diversify its sources[5]. Following the extant research (for example Wydick et al., 2011 and Luan et al., 2015), the household's wealth is approximated by a series of dummies, which capture the ownership of different goods: TV, radio, motorbike and refrigerator. Actually, the data contain information about the ownership of eighteen different durable goods, which may be used to proxy the household's wealth. To avoid the inclusion of eighteen dummies, a principal component analysis is run on these variables and the components with eigenvalue lager than one are included in one of the specifications of the model (the correlation matrix between these eighteen dummies and the five components retained is presented in Table 1). Assets other than land may either correlate positively with the quantity of credit demanded, as the household has more collateral available, or negatively, as richer households need less credit (Shoji et al., 2012). The questionnaire also provides a dummy for being poor in absolute terms or not (in this case poor means that the household is officially classified as "poor" according to the World Bank standards, i.e. a per-capita income of the household's members lower than 1 USD a day).

Other controls include the yield per hectare and the price of the commodity grown in the third- and in the second-to-last crop seasons (i.e. the last two seasons before the interview). These controls capture the effect of meteorological and market shocks on the household's income and,

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[5] However, Barrett et al. (2001a and 2001b) highlight that if people seeking off-farm jobs are from poor farmer households, then they are very likely low skilled and get trapped in low-wage and unskilled jobs. This phenomenon contributes to keep poor households in poverty. However, Reardon (1997) finds that generally the diversification of income sources increases the household's total income.

therefore, on its need for financial aid. Moreover, bad crop seasons may increase also the interest rates required by the lenders both because of worse solvability conditions of the farmers and because of an increase in the demand for loans (see for example the theoretical discussion of Barham et al., 1996).

The analysis proposed in the following section is twofold. First, probit regressions analyse the probability of asking for informal loans. Also in this case, the main variable of interest is the share of cultivated land owned by the household. These regressions inquiry whether the share of owned land has some impact on the probability of resorting to informal credit. In such a case the dependent variable is a dummy taking value 1 if the household has borrowed money from informal institutions and 0 otherwise. The amount borrowed has no effect on the dummy (i.e. I consider any loan, no matter the amount). A second set of regressions presents the results of tobit regressions, where the dependent variable is the cost of the informal credit (i.e. the monthly interest rate paid by the farmer). Several farmers declared not to have borrowed from informal lenders, but this information may contain underreporting: not all the borrowers may want to disclose that they resorted to informal credit, as the interviewer worked to the World Bank, which is a formal lender. For this reason, some declared zeros, may hide actual informal borrowing. Given this, running tobit regressions on the whole dataset is a better strategy than deleting the households declaring no informal borrowing (García and Labeaga, 1996 and Humphreys, 2013). This procedure entails censoring the dependent variable at 0.

Table 2 presents the descriptive statistics for the variables used in the regressions.

4. Results

Table 3 reports the probit estimates for resorting to informal credit. The figures show that as the share of cultivated land owned increases, the probability of resorting to informal credit

decreases. This result is in line with the initial expectations: on the one hand, land ownership allows farmers to access formal credit more easily (Guirkinger, 2008). On the other hand, it is likely that households, which own large shares of the land that they cultivate, also need less credit than the other households, as the former have more assets and higher incomes than the latter. In line with the extant literature that highlights the complementarity between formal and informal credit, the probability of resorting to informal credit correlates positively with the amount of credit obtained from formal institutions. A possible interpretation of this outcome is that households, which can access large loans from formal institutions, are also financially more solid than the households that do not access such large credit amounts. Indeed, the interest rate paid on the formal credit has a negative and statistically significant impact on the probability of obtaining credit from informal lenders. This result suggests that 1) as the quality of the debtor worsens (i.e. the interest rate paid to the formal lender increases), the probability of asking credit to or of obtaining credit from informal lenders. 2) As the absorption of economic resources (which increases with the interest rate paid on formal loans) increases, the household's ability of borrowing more (from other sources) decreases. As the income from crops increases, so does the probability of accessing informal credit; the number of people working outside the farm has the same effect (in line with Awunyo-Vitor and Abankwah, 2012). Probably high levels of these two variables represent a sort of additional collateral usable to access credit. The data do not allow for testing this hypothesis; however, the presence of informal lenders witnesses a situation of credit scarcity; in such a situation, the outcomes of the analysis may suggest that the households without additional collaterals (such as income from sources external to the farm) may desire more credit than they are able to obtain. The literature (see for example Barrett et al., 2001 and Stampini and Davis, 2009) shows that credit rationing is a major reason to look for jobs outside the household's farm.

The yield per hectare of cultivated land in the season before the interview has a negative impact on the probability of accessing informal credit. Indeed, as the yield increases, so does income and therefore the household has both more food and more money, and therefore needs less credit. The principal components that proxy the household's wealth (last column of Table 3) have no statistically significant effect (in line with other studies, such as Barslund and Tarp, 2008).

Table 4 reports the tobit estimates, where the dependent variable is monthly interest rate on loans paid to informal lenders. The first outcome is that the level of the interest rate depends positively on the amount borrowed. The share of land owned by the household[6] has a negative and statistically significant impact on the interest rate applied to informal loans, as expected. This effect is robust to different specifications and increases after adding additional controls (although the addition of variables controlling for the household's wealth and for the land yields decrease it slightly). The coefficient has the expected sign: as the share of ownership of the land cultivated by the household increases, the cost of informal debt decreases. This suggests that land constitutes a form of collateral in the market of informal credit. The data do not allow to disentangle whether land is a direct collateral (i.e. if the farmer does not pay back the loan, then the land is transferred to the creditor), or an indirect collateral (i.e. it is a proxy for the household's wealth and, consequently, for its solvability through higher flows of income). However, the magnitude of the coefficient taken in absolute terms increases after the addition of controls for other assets owned by the household. This suggests that land ownership represents rather a direct than an indirect collateral for the informal lender[7]. This interpretation of the results is particularly relevant: this

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[6] Remember that this is measured in logarithms.

[7] The rationale behind this conclusion is the following: first assume that land is an indirect collateral. Nevertheless, it is a good proxy for the household's wealth, therefore, if other assets are given as collateral, when these are not included in the regression, their effect is (at least partially) captured by land. Consequently, the introduction of measures of wealth other than land should make the coefficient for land to approach to zero. Since this does not happen, but as land ownership has a statistically significant effect on the interest rate, the most probable interpretation is that land ownership constitutes an indirect form of collateral.

entails that – for a given amount borrowed in the informal credit market – the households owning small shares of land pay higher interests and therefore have a higher risk of defaulting. In this last case they would lose portions of the land owned, risking a sort of "social downgrade" from independent farmers (who cultivate owned fields) to salaried farmers. An alternative to this "downgrade", common in the developing countries, is migrating from the countryside to the industrialising towns, usually engendering additional social problems in these areas (see for example Lipton, 1980 and Marx et al., 2013).

Per-capita income does not display any statistically significant effect on the cost of informal credit. However, households officially classified as poor pay higher interest rates. Moreover, the dummies that capture the ownership of TV and radio sets, motorbikes and refrigerators have almost no effect, but owning a refrigerator in the last specification. However, in this last case the sign of the coefficient is surprisingly positive. Of the five principal components extracted from the eighteen dummies registering the property of durables, only two display a coefficient that is statistically significant.

The share of the household's income coming from crops and the number of household's members working in the farm display positive and statistically significant coefficients. These figures suggest that the cost of informal credit increases as the diversification of the income sources of the household decreases. Such a result is in line with what one can expect in any credit market. It is important to recall here that households with members working outside the farm have a higher probability than the others of borrowing also from informal lenders. As the tobit analysis suggests, these households pay lower interest rates than those whose income comes mainly from crops, therefore the higher probability of borrowing from informal lenders may be explained also by lower interest rates. However, another possible interpretation is therefore that – for a given level of income – diversification of its sources increases the financial solidity of a household, which may then

resort to informal credit and decreases the cost of it. There are several possible interpretations for this outcome: 1) informal lenders are more willing to lend to households, whose sources of income are diversified. 2) Diversification of income sources reduces the variability of income over time; therefore, their planned future expenses and investments can rely more on income and need less formal credit to be achieved. This leaves more room to apply for informal credit, generally used to finance consumption rather than production. The crop yields in second-to-last crop season has a negative and statistically significant effect on the interest rate paid in the informal credit market. High yields may come from better soil quality or better farming techniques, lowering the riskiness of the borrower and, consequently, the price paid for loans.

Age of the household's head and the number of years lived in the same village where the household lived at the time of the interview display a negative effect on the interest rate. These results are in line with the expectations and with what found by the literature. Households living in the same place for long times have higher levels of social capital (i.e. have denser and stronger local networks) than households recently settled in the village. In the rural areas of developing countries, access to informal credit depends on social networks (Manig, 1996; Guirkinger, 2008; Wydick et al., 2011 and Mwangi and Ouma, 2012); moreover, social capital constitutes a major collateral for loans (Giné, 2011)[8], therefore reducing the risk premium paid to the lender (Feder et al., 1988).

To offer a clearer interpretation of the results obtained in this paper and to show the relevance of land ownership in determining the interest rate paid by borrowers in the informal

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[8] In rural Vietnam, social capital is relevant also for accessing formal credit: the government-owned *Vietnam Bank for Social Policies* lends only to farmers who are members of credit groups. These are constituted at local level, and decide whether to allow a farmer to apply for credit; in addition, the group also decides the maximum amount borrowable by the farmer (Cuong, 2008). In 2008 94% of the credit lent by the *Vietnam Bank for Social Policies* followed passed through these credit groups (Duy et al., 2012). Similarly, the *Vietnam Bank for the Poor* operates through Women's, Farmers' and People's Unions (Barslund and Tarp, 2008). However, this does not seem to be a Vietnamese peculiarity: also in Chile (Reyes and Lensink, 2011) and in South Africa (Baiyegunhi and Fraser, 2014) social capital facilitates the relationships between borrowers and formal lending institutions. Always with reference to Vietnam, Nguyen and Luu (2013) show that social connections facilitate credit accessibility also for industrial SMEs outside rural areas.

credit market of Mekong Delta, I give an image of the impact of the ownership share on the interest rate in Figure 1. The solid curve in the graph represents the difference between the average interest rate paid by a household whose share of owned land is equal to *x* and the average interest rate paid by the farmers who own all the land that they cultivate (for which, indeed, the difference is equal to 0). This representation shows that the decrease in the "premium" is not linear and that it decreases fast when the share of owned land is relatively very small or very large. Figure 2 represents the marginal variation of the premium for any given ownership share. This marginal rate is always negative, confirming that as the share of cultivated land owned increases, the interest rate paid decreases. The form of the marginal rate curve is concave, graphically showing what observed before: the marginal rate is large in absolute terms for ownership shares below 10% and becomes large again for ownership shares larger than 80%. The dashed lines in the two graph represents the linear interpolations of the data. They are useful to compare the punctual values of the curves to the average trend represented by these dashed lines.

The cost of informal credit represents a non-negligible burden for the famers. The average amount borrowed by households who access the informal credit market in the Mekong Delta is 3,508,125 dongs, slightly less than the average yearly per-capita income of the farmers in the sample. Given an average household's size of 5.02, the figures tell that the average informal loan amounts to about 20% of the total yearly household income. This implies that a 1-percentage point differential in the monthly interest rate paid represents – on a yearly base – an absorption of 2.30% of the household yearly income. In other words, a household owning 50% of the land cultivated would have an additional burden of about 4.50% of its yearly income with respect to a household that owns all the land cultivated.

5. Conclusions

The evidence provided in this paper suggests that land ownership decreases both the need of accessing informal credit and the cost of it. In other words, the land reforms, which have redistributed the property of the land from large to small farmers in developing countries may contribute to reduce the problem of informal credit and to alleviate the burden represented by it on the budgets of the farming households. Therefore, the implementation of effective land reforms seems to have a positive impact on the cost and on the quality of credit.

Other possible policies to fight the problem of informal credit may entail the provision of alternative jobs in the countryside of Vietnam and of developing countries more in general. The results of the analysis show that diversifying the sources of income reduces both the resorting to informal credit and its cost. Some developing countries have already planned and implemented programmes aimed at sustaining the income of the population living in the rural areas (for example the Mahatma Gandhi National Rural Employment Guarantee Act in India)[9]. However, these programmes should also consider that people from relatively rich farms are more likely to access off-farm jobs, outside government plans. Indeed, as Barrett et al. (2001a) point out, in the off-farm rural job markets, candidates from relatively rich farmer households are – on average – more skilled than candidates from poor households. This increases the probability of finding an off-farm job for the former with respect to the latter. Therefore, public programmes aimed at increasing off-farm employment in rural areas should target especially the poor.

An open question concerning land reforms is how much land should be allocated to each household (or, alternatively how much land should be distributed per-capita) to render this redistribution effective to give the farmers enough economic independence. In other words, the

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[9] See Chopra (2014).

extensions allocated in the past Vietnamese reform may have underestimated the farmers' needs, and this may explain the persistence of informal credit markets in the Mekong Delta. Households, which own insufficient extensions, may lack the income and the collaterals to obtain full credit in the formal market. Further research should address also this issue.

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Table 1. Correlations between the principal components and the originating variables (s.e. in parentheses)

	Component 1	Component 2	Component 3	Component 4	Component 5
Television	0.425	0.423	0.045	-0.015	0.022
	(0.000)	(0.000)	(0.245)	(0.715)	(0.582)
Radio	0.423	0.102	-0.040	-0.026	0.461
	(0.000)	(0.012)	(0.328)	(0.522)	(0.000)
Music player system	0.540	-0.017	0.320	0.234	0.118
	(0.000)	(0.673)	(0.000)	(0.000)	(0.004)
Video/DVCD	0.664	0.014	0.252	0.295	0.000
	(0.000)	(0.734)	(0.000)	(0.000)	(0.996)
Bicycle	0.233	0.439	-0.343	0.142	-0.176
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Motorbike	0.645	-0.107	-0.193	0.170	-0.063
	(0.000)	(0.008)	(0.000)	(0.000)	(0.121)
Refrigerator	0.413	-0.377	0.114	-0.066	-0.395
	(0.000)	(0.000)	(0.005)	(0.106)	(0.000)
Electric fan	0.460	0.471	-0.211	-0.185	0.116
	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)
Telephone	0.482	-0.355	-0.052	-0.038	-0.297
	(0.000)	(0.000)	(0.198)	(0.353)	(0.000)
Computer	0.014	0.207	0.238	0.750	0.003
	(0.730)	(0.000)	(0.000)	(0.000)	(0.935)
Cooker	0.580	0.212	0.018	-0.350	-0.092
	(0.000)	(0.000)	(0.662)	(0.000)	(0.024)
Gas stoven	0.662	0.029	0.178	-0.216	-0.138
	(0.000)	(0.476)	(0.000)	(0.000)	(0.000)
Washing machine	0.133	-0.341	0.301	-0.141	0.168
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Bathroom/toilet	0.510	-0.149	-0.157	0.032	-0.157
	(0.000)	(0.002)	(0.000)	(0.433)	(0.000)
Motor boat	-0.052	0.316	0.689	-0.283	0.075
	(0.199)	(0.000)	(0.000)	(0.000)	(0.067)
High quality furniture	0.519	-0.215	0.034	-0.038	0.415
	(0.000)	(0.000)	(0.407)	(0.353)	(0.000)
Pipewater connection	0.333	-0.125	-0.409	-0.030	0.496
	(0.000)	(0.000)	(0.000)	(0.460)	(0.000)
Other high value items	0.198	-0.037	0.006	-0.040	0.022
	(0.000)	(0.369)	(0.882)	(0.324)	(0.596)

Table 2. Descriptive statistics (s.e. in brackets)

	Mean
Average monthly interest rate paid in the informal market	6.63
	(0.52)
Average amount borrowed in the informal market (million dongs)	5.06
	(10.41)
Average yearly interest rate paid in the formal market	47.35
	(0.559)
Average amount borrowed in the formal market (million dongs)	3.51
	(0.80)
Income and its sources	
Income from hired labour (million dongs)	2.45
	(0.52)
In-kind income (dongs)	70,083
	(47,430)
Remittances (dongs)	461,857
	(2,144,181)
Logarithm of the share of owned land	4.58
	(0.17)
Poor (dummy: 1 if yes)	0.19
	(0.39)
Income per capita (million dongs)	3.86
	(3.29)
Income from crops (% of total income)	68.39
	(25.98)
Allocation of working force	
Working time of household's members in the farm (% of total working time)	76.33
	(23.59)
Number of households members working outside the farm	1.56
	(0.50)
Working time of household's members outside the farm (% of total working time)	13.02
	(20.89)
Number of households members working in the farm	2.31
	(1.18)
Indicators of social capital	
Number of years in the village	36.61
	(13.54)
Age of the household's head	43.55
	(10.99)
Use of soil	
Hectares of rice soil	1.27
	(1.19)
Hectares of orchard soil	0.14
	(0.28)
Hectares of other crops	0.05
	(0.19)
Hectares of aquaculture	0.01
	(0.05)
Hectares of residential soil	0.38
	(0.43)
Indicators of past productivity and prices of crops	
Average yield per hectare of the main crop (second-to-last season)	2.11
	(3.03)
Average yield per hectare of the main crop (third-to-last season)	2.77
	(3.62)
Average price of the main crop (second-to-last season)	752.65
	(907.76)
Average price of the main crop (third-to-last season)	1,009.10
	(778.47)
Ownership of durable goods (percentage of owners)	
TV set	15.92
	(36.62)
Radio set	40.13
	(49.06)
Motorbike	58.54
	(49.31)
Refrigerator	94.86
	(22.10)

Table 3. Land ownership and resorting to informal credit. Probit estimates (s.e. in brackets)

	(1)		(2)		(3)		(4)	
Dependent variable				Has informal loan				
VARIABLES	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect	Coefficient	Marginal effect
Interest rate paid on formal loan					-0.330	-0.00630	-0.410	-0.00456
					(0.193)*	(0.00398)*	(0.212)*	(0.00273)*
Amount borrowed from formal moneylender					1.33e-08	2.55e-10	1.64e-08	1.82e-10
					(7.00e-09)*	(1.55e-10)*	(6.59e-09)**	(9.98e-11)*
Share of owned land	-0.0129	-0.000312	-0.0142	-0.000301	-0.0144	-0.000275	-0.0153	-0.000171
	(0.00643)**	(0.000192)*	(0.00635)**	(0.000178)*	(0.00638)**	(0.000176)*	(0.00663)**	(0.000114)*
Hectares of rice soil	-0.282	-0.00682	-0.285	-0.00606	-0.311	-0.00594	-0.238	-0.00265
	(0.150)*	(0.00422)	(0.158)*	(0.00377)*	(0.133)**	(0.00337)*	(0.121)**	(0.00175)*
Hectares of other crops	-1.082	-0.0262	-1.062	-0.0226	-1.185	-0.0226	-1.045	-0.0116
	(1.141)	(0.0243)	(1.136)	(0.0218)	(1.245)	(0.0211)	(1.090)	(0.0114)
Hectares of orchards	-0.0672	-0.00163	-0.0199	-0.000422	-0.0484	-0.000926	0.0387	0.000431
	(0.527)	(0.0129)	(0.519)	(0.0110)	(0.556)	(0.0106)	(0.545)	(0.00605)
Income from crops	0.00729	0.000176	0.00724	0.000154	0.00767	0.000147	0.00910	0.000101
	(0.00425)*	(0.000114)	(0.00430)*	(9.56e-05)*	(0.00454)*	(9.15e-05)*	(0.00445)**	(6.85e-05)*
Age	-0.00861	-0.000208	-0.0196	-0.000417	-0.0190	-0.000362	-0.0206	-0.000230
	(0.00758)	(0.000216)	(0.0114)*	(0.000330)	(0.0114)*	(0.000304)	(0.0116)*	(0.000197)
Hectares of residential soil	0.000219	5.30e-06	0.000263	5.59e-06	0.000249	4.76e-06	0.000252	2.80e-06
	(0.000169)	(3.68e-06)	(0.000163)	(3.32e-06)*	(0.000166)	(3.04e-06)	(0.000166)	(1.89e-06)
Working time of household's members in the farm (% of total working time)	-0.000689	-1.67e-05	0.000163	3.46e-06	-3.38e-05	-6.46e-07	-0.00132	-1.47e-05
	(0.00476)	(0.000114)	(0.00488)	(0.000104)	(0.00480)	(9.16e-05)	(0.00492)	(5.24e-05)
Number of households members working in the farm	-0.109	-0.00263	-0.0896	-0.00190	-0.108	-0.00207	-0.0596	-0.000663
	(0.115)	(0.00297)	(0.115)	(0.00259)	(0.117)	(0.00245)	(0.119)	(0.00141)
Number of households members working outside the farm	0.554	0.0134	0.592	0.0126	0.593	0.0113	0.623	0.00694
	(0.236)**	(0.00601)**	(0.237)**	(0.00544)**	(0.240)**	(0.00505)**	(0.249)**	(0.00403)*
Average yield per hectare of the main crop (second-to-last season)	-0.220	-0.00532	-0.228	-0.00485	-0.241	-0.00460	-0.253	-0.00281
	(0.0794)***	(0.00210)**	(0.0778)***	(0.00194)**	(0.0838)***	(0.00190)**	(0.0992)**	(0.00129)**
Average yield per hectare of the main crop (third-to-last season)	0.00569	0.000138	0.00591	0.000126	0.00677	0.000129	0.00809	9.01e-05
	(0.00533)	(0.000117)	(0.00527)	(0.000105)	(0.00541)	(9.29e-05)	(0.00559)	(5.98e-05)
Income per capita (million dongs)	0.0153	0.000370	0.00765	0.000163	0.00707	0.000135	0.0114	0.000127
	(0.0194)	(0.000505)	(0.0183)	(0.000388)	(0.0183)	(0.000354)	(0.0191)	(0.000228)
Number of years in the village			-0.0141	-0.000300	-0.0128	-0.000245	-0.0104	-0.000115
			(0.00989)	(0.000268)	(0.00972)	(0.000241)	(0.0100)	(0.000144)
Number of household members			-0.0434	-0.000922	-0.0407	-0.000777	-0.0866	-0.000964
			(0.0609)	(0.00131)	(0.0641)	(0.00123)	(0.0663)	(0.000856)
Component 1							0.158	0.00176
							(0.0963)	(0.00126)
Component 2							-0.176	-0.00196
							(0.124)	(0.00165)
Component 3							-0.0693	-0.000771
							(0.137)	(0.00156)
Component 4							0.139	0.00154
							(0.0944)	(0.00123)
Component 5							0.186	0.00208
							(0.127)	(0.00177)
Constant	15.42		37.71		36.50		39.50	
	(15.12)		(22.55)*		(22.56)		(23.08)*	
Observations	603	603	603	603	603	603	603	603

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4. Cost of credit and land ownership. Tobit estimates (s.e. in brackets).

Specification	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	Average monthly interest rate paid in the informal credit market						
Average amount borrowed in the informal market (million dongs)	-0.250	-0.147	-0.0194	-0.00541	0.0794	0.116	0.0668
	(0.241)	(0.208)	(0.0520)	(0.0409)	(0.0373)**	(0.0529)**	(0.0715)
Average yearly interest rate paid in the formal market	-0.0101	-0.407	-0.984	-0.787	-1.205	-1.692	-1.040
	(1.377)	(1.121)	(1.053)	(0.885)	(0.960)	(0.971)*	(0.961)
Average amount borrowed in the formal market (million dongs)	2.067	2.012	2.113	2.102	2.234	2.281	2.054
	(0.775)***	(0.742)***	(0.807)***	(0.793)***	(0.695)***	(0.562)***	(0.469)***
Logarithm of the share of owned land	-3.178	-3.365	-3.452	-4.183	-4.195	-3.964	-4.198
	(1.507)**	(1.531)**	(1.400)**	(1.563)***	(1.435)***	(1.318)***	(1.329)***
Income and its sources							
Income from hired labour (million dongs)		-1.89e-07	-3.27e-08	2.59e-08	2.89e-08	-2.48e-08	-1.08e-07
		(2.52e-07)	(1.58e-07)	(1.69e-07)	(1.67e-07)	(1.50e-07)	(2.31e-07)
In-kind income (dongs)		-5.45e-07	-2.43e-07	-1.72e-07	2.57e-07	-9.44e-07	-7.87e-07
		(1.31e-06)	(6.93e-07)	(7.03e-07)	(4.17e-07)	(1.98e-06)	(2.47e-06)
Remittances (dongs)		-3.92e-07	-3.05e-07	-3.91e-07	-8.08e-07	-5.41e-07	-5.17e-07
		(4.18e-07)	(3.79e-07)	(4.16e-07)	(5.52e-07)	(5.29e-07)	(5.53e-07)
Poor (dummy: 1 if yes)		2.341	2.174	2.506	2.095	3.520	2.576
		(1.262)*	(1.263)*	(1.075)**	(0.837)**	(1.231)***	(1.119)**
Income per capita (million dongs)		0.0951	0.102	0.0786	0.0447	0.116	0.169
		(0.0799)	(0.0827)	(0.0791)	(0.0834)	(0.0697)*	(0.0697)**
Income from crops (% of total income)						0.0830	0.0861
						(0.0354)**	(0.0325)***
Principal components extracted from the ownership of durable goods							
Component 1							1.348
							(0.528)**
Component 2							-1.367
							(0.765)*
Component 3							0.588
							(0.639)
Component 4							0.0641
							(0.403)
Component 5							0.798
							(0.823)
Allocation of working force and of working time							
Working time of household's members in the farm (% of total working time)				0.0515	0.0834	0.0629	0.0676
				(0.0413)	(0.0381)**	(0.0342)*	(0.0383)*
Number of households members working outside the farm				0.976	1.670	0.528	1.051
				(1.341)	(1.363)	(0.973)	(0.981)
Working time of household's members outside the farm (% of total working time)				0.0504	0.0609	0.0563	0.0639
				(0.0432)	(0.0429)	(0.0415)	(0.0433)
Number of households members working in the farm						-0.811	-0.584
						(0.649)	(0.550)
Indicators of social capital							
Number of years in the village				-0.0574	-0.119	-0.0931	-0.0878
				(0.0410)	(0.0473)**	(0.0482)*	(0.0532)*
Age of the household's head					-0.126	-0.129	-0.141
					(0.0630)**	(0.0675)*	(0.0756)*
Use of soil							
Hectares of rice soil					-1.277	-1.234	-1.186
					(0.590)**	(0.751)	(0.930)
Hectares of orchard soil					-3.040	-2.720	-2.190
					(3.720)	(3.484)	(2.384)
Hectares of other crops					-47.66	-47.32	-43.51
					(68.54)	(42.53)	(34.01)
Hectares of aquaculture					-8.702	-11.69	-3.034
					(20.12)	(24.80)	(18.65)
Hectares of residential soil						-0.00263	-0.00324
						(0.00165)	(0.00191)*
Indicators of land profitability							
Average yield per hectare of the main crop (second-to-last season)						-0.655	-0.520
						(0.286)**	(0.366)
Average yield per hectare of the main crop (third-to-last season)						-0.212	-0.306
						(0.393)	(0.443)
Average price of the main crop (second-to-last season)						0.00114	0.00103
						(0.000737)	(0.000707)
Average price of the main crop (third-to-last season)						-0.000589	-0.000401
						(0.00107)	(0.00103)
Ownership of durable goods							
TV set				-1.829	-2.188	-2.036	-2.752
				(1.636)	(1.649)	(1.546)	(1.604)*
Radio set				1.905	2.192	2.073	1.748
				(1.374)	(1.352)	(1.224)*	(1.052)*
Motorbike				0.614	0.635	0.215	-0.0977
				(1.514)	(1.484)	(1.451)	(1.325)
Refrigerator				9.988	10.39	12.37	14.14
				(9.159)	(9.512)	(8.632)	(6.815)**
Constant	4.247	4.593	-16.75	-18.61	226.1	229.8	279.4
	(6.749)	(6.786)	(19.83)	(22.40)	(130.9)*	(136.4)*	(152.0)*
Observations	601	601	601	601	601	601	601

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

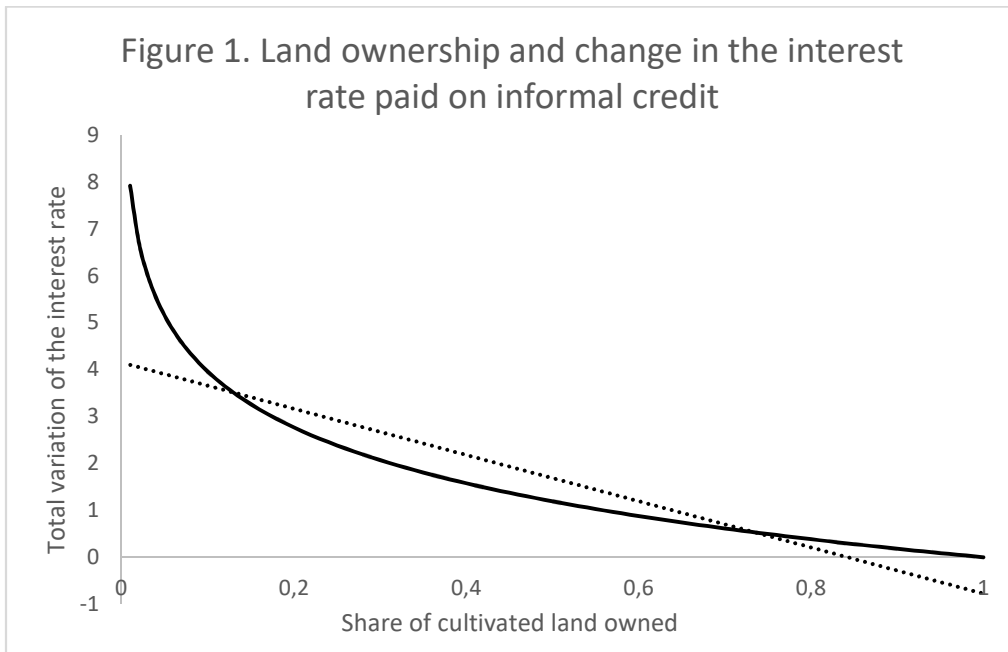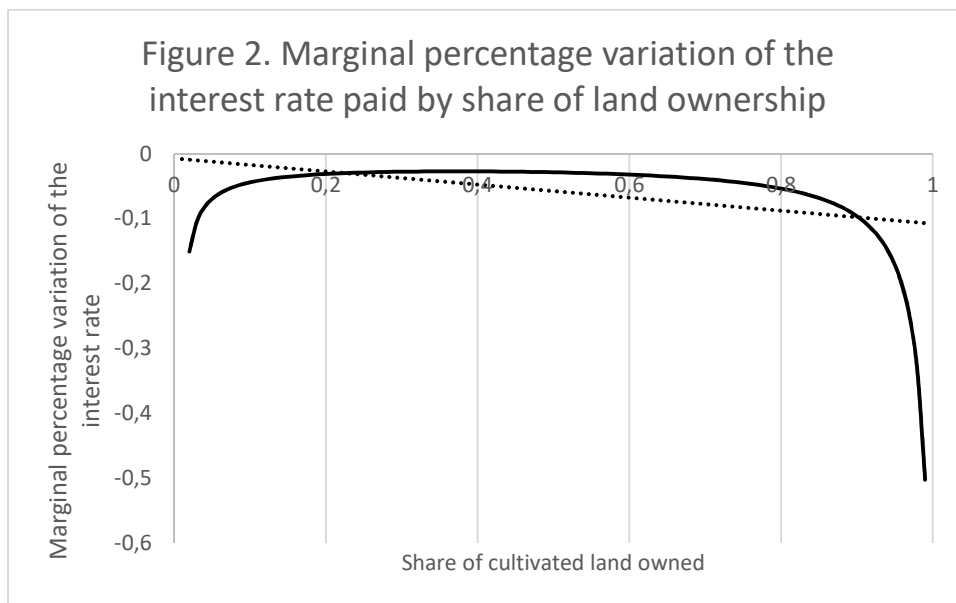Figure 1. Land ownership and change in the interest rate paid on informal credit

Figure 2. Marginal percentage variation of the interest rate paid by share of land ownership

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