Thailand Vietnam Socio Economic Panel

Explaining differences in rural household debt between Thailand and Vietnam: Economic environment versus household characteristics

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2017

TVSEP Working Paper

WP-002

Gefördert durch DFG Deutsche Forschungsgemeinschaft

Leibniz Universität Hannover

GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN

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Explaining Differences in Rural Household Debt between Thailand and Vietnam: Economic Environment versus Household Characteristics

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Abstract

This study explores cross-country differences in debt market participation, level of household debt holding and over-indebtedness between rural households in Thailand and Vietnam. We identify socio-economic determinants for rural households in Thailand and Vietnam by decomposing differences into those attributable to household characteristics and those due to economic environments using three decomposition methods. Significant differences are found in debt market participation, the level of debt and the extent of indebtedness. Our major findings are that differences in the economic environment are more important than household characteristics. While in Vietnam poorer households are less likely to engage in borrowing in Thailand a higher share of similar type of households participate in debt markets and are more indebted because of more liberal credit market conditions. The policy message of the paper is that credit market expansions in rural areas should be aligned with households borrowing capacity.

Keywords: Rural households, Microcredit, Household debt, Household Indebtedness, Decomposition Analysis, Thailand, Vietnam

JEL: D14, G11, R11

RePEc:tvs:wpaper:wp-002

1. Introduction

Unlike in advanced economies cross-country comparison on household debt holding in the emerging market economies have rarely been done due to lack of suitable micro level data (Aminudin & Tissot, 2015). Such comparisons require households are similar in terms of socio-economic characteristics and in addition to information on difference in economic environments of the countires (Christelis, Ehrmann, & Georgarakos, 2015). In Asian countries the measurement of household debt is constrained by the large share of informal lending and the highly variable density of banks especially in rural areas (ADB, 2015). Little is known about the prevalence of debt, the levels of debt holding and indebtedness. Since credit markets are an important driver of development in rural areas in Asian emerging market economies there is a need to better understand the opportunities and risks from rapid credit market expansion.

Research in advanced economies comparing household debt across countries decompose the cross-country differences into a part that arises from differences in household characteristics such as age, education, income, assets and savings and those arising from differences in the economic environment (e.g., Christelis, Georgarakos, & Haliassos, 2013; Jappelli et al., 2013; Coletta et al., 2014; Wu, Fasianos and Kinsella, 2015; Christelis et al. 2015; Loschiavo, 2016; Bover et al., 2016). According to Christelis et al. (2015), the underlying factors behind cross-country differences in economic environment are differences in (1) market characteristics such as the accessibility of certain debt products, (2) legal conditions such as legal enforcement of contracts indicated by the time needed to repossess collateral, taxation of debt, regulatory loan-to-value ratios at origination and depth of information about borrowers (Bover et al., 2016), (3) cultural factors such as social acceptance of indebtedness or (4) policies such as macro-prudential or monetary policies.

In this paper, we add to the literature on household debt by specifically focusing on rural households in Thailand and Vietnam, two emerging economies who showed rapid economic growth but are also marked by increasing inequality especially between urban and rural areas. We analyze cross-country differences in debt market participation, level of debt holding and indebtedness in Thailand and Vietnam. In both countries informal lending is still important and rural household debts are rising (ADB, 2015). We use household survey data of the Thailand Vietnam Socioeconomic Panel (www.tvsep.de).

As empirical strategy we use decomposition methods to model debt market participation, level of household debt holding and over-indebtedness. First, we apply an extension of the Oaxaca-Blinder (Blinder 1973; Oaxaca 1973) decomposition method for non-linear models to calculate differences in prevalence of debt and over-indebtedness. Second, the Oaxaca-Blinder decomposition method is used to calculate the average differences in conditional amount of debt holding and indebtedness. Finally, the RIF-regression method proposed by Firpo, Fortin and Lemieux (2009) is used to decompose the conditional amount of debt holding and indebtedness gap across the two countries and identify the contribution of individual covariates at different quantiles of the unconditional distributions.

We find significant differences in debt market participation rates, debt holding and indebtedness between rural households in Thailand and Vietnam. Higher prevalence of debt and over-indebtedness is found in Thailand. Particularly for the economically disadvantaged rural households, the economic environment in Thailand is more lenient to borrowing as compared to Vietnam. Additionally, differences in household characteristics explain the higher level of debt holding among rural households in Thailand. Finally, the findings from the Recentered Influence Function (RIF) regression decomposition analysis reveal that the differences in level of debt holdings and indebtedness increases when moving up the debt distribution.

The remainder of the paper is organized as follows: Section 2 briefly discusses the data we use. Section 4 presents the decomposition methods used. Section 5 and 6 outlines the results and provides concluding remarks.

2. Data

We use the 2008 survey data of 4200 rural households from six provinces in Northeastern Thailand and the North Central Coast and Central Highland of Vietnam. The data are representative for rural households in these regions in the two countries. The survey methodology and sampling procedure is described in detail in Hardeweg, et al. (2013).

The data contain detailed information on households borrowing, loan defaults and arrears along with a full set of household level data such as households demographics, social and economic characteristics and special modules on risks and shocks. This detailed data on financial situation of households allows us to examine rural households borrowing behavior in in the two countries and decompose the differences into their separate underlying factors. In total, we compare 2148 rural households in Vietnam with 2136 rural households in Thailand.

3. Explanatory variables

This section discusses the explanatory variables that are included in the decomposition analysis. The explanatory variables include various socio-economic and demographic characteristics that determine household's participation in the debt market and their level of indebtedness. The choice of the explanatory variables is largely based on the existing literature dealing with households indebtedness in both developing and developed countries, including Disney et al. (2008), Brown and Taylor (2008), D'Alessio and Iezzi (2013), Schicks (2014), Wu et al. (2015) and Christelis et al. (2015).

In the decomposition analysis, we control for observed households characteristics such as age (household head aged below 39, 40 - 49, 50 - 59, 60 and above; taking 60 and above as the case category), gender (female or male household head; taking female as the base category), level of education of the household head (illiterate, primary, secondary and higher education; taking illiterate as the base category), marital status (married or single; taking single as the base category), household size, main occupation of household head (inactive, agricultural, off-farm employed and self-employed; taking inactive as the base category), household income and wealth quintiles (dummy variables that group households into quintiles according to households' income and wealth quintile distributions in Thailand; taking the first quintile as

the base category), type of shock households experienced (unexpected shock to expenses, expected shocks to expenses and unexpected shocks to income), future financial expectation of households (better, same and worst; taking worst as the base category) and their risk attitudes (risk averse, risk neutral, risk takers; taking risk takers as the base category). Household's future financial expectation dummy variables were constructed using the question "Do you think your household will be better off next year?" The risk attitude of the households is based on a Likert scale response of 0 "unwilling to take risk" to 10 "fully prepared to take risk" for a question "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risk?". Then, based on the Likert scale, we grouped the households into the three categories.

Table 1 shows a comparison of average characteristics of rural households in Thailand and Vietnam. On average, there are more Thai households in the top income, financial and real wealth quintiles than the Vietnamese households reflecting that Thai households have higher capacity to shoulder more debt than the Vietnamese households. On the contrary, rural households in Vietnam are younger and more educated and hence have higher earning capacity in the future which might explain a higher willingness to borrow and hold large amount of debt. However, Vietnamese rural households are also on average more risk averse than the Thai households and hence maybe less willing to hold large amount of debt.

Table 1 here

4. Empirical Strategy

This section outlines the methods used to decompose the observed difference in debt prevalence, debt holdings and over-indebtedness among rural households in Thailand and Vietnam, and proceeds in four parts. First, we begin with a discussion on the identification strategy and the parameters of interest using the observed log of debt distribution as an example to simplify the discussion. We then explain the three decomposition methods used to model differences in debt situation at a point in time, namely the non-linear Oaxaca-Blinder decomposition method (Fairlie 1999), the mean based Oaxaca-Blinder decomposition method (Blinder 1973; Oaxaca 1973) and the RIF-regression decomposition method (Firpo et al., 2009). These methods allow the observed differences to be decomposed into a part attributable to differences in the configuration of household characteristics (composition or endowment effect) and a part attributable to differences in the influence of a given set of characteristics due to cross-country differences in cultural, institutional and economic environment (coefficients or structural effect). The discussion on the decomposition methods is heavily based on Fortin, Leimieux, and Fripo (2011).

4.1. Identification strategy

All three decomposition methods are based on estimating unconditional counterfactual distributions of the dependent variables. For the mutually exclusive groups of Thai rural households (T) and Vietnamese rural households (V), we for example observe the log of debt for each group (Y_T and Y_V respectively). The unconditional counterfactual distribution is then constructed to simulate how the log of debt distribution of rural households in Vietnam would

be if they had the same configuration of characteristics and faced the same economic environment as rural households in Thailand, or conversely, what the log of debt distribution of rural households in Thailand would have been if they had the same configuration of characteristics and faced the same economic environment as rural households in Vietnam. In other words, the observed household debt distribution of Thai rural households provides a counterfactual for Vietnamese households, and vice versa. To establish these counterfactual distributions, the decomposition methods first examine the relationship between debt outcome variables such as log of debt and a set of observed and unobserved household characteristics.

$$Y_c = \theta_c(X_c, \varepsilon_c),\ c \in \{T, V\}\ \varepsilon_c \tag{1}$$

$$\Delta_Y = Y_V - Y_T = [\theta_V(X_V, \varepsilon_V)] - [\theta_T(X_T, \varepsilon_T)] \tag{2}$$

where X_V and X_T are vectors of observable characteristics, θ_V and θ_T are the functional forms of the log of debt equation and ε_V and ε_T are vectors of unobservable characteristics for the Vietnamese and Thai rural household groups respectively.

The unconditional counterfactual distribution of the log of debt can then be constructed by integrating the conditional distribution of log of debt given a set of observable characteristics of Vietnamese rural household over the marginal distribution of observable characteristics of the Thai rural household. If the unconditional distribution of log of debt of rural households in each country is given by:

$$F_{Y_c}(Y) = \int F_{Y_c|X}(Y|X = x)\,.\,dF_{X_c}(X), c \in \{T, V\} \tag{3}$$

where $F_{Y_c|X}(Y|X = x)$ is the conditional distribution of log of debt and $F_{X_c}(X)$ is the marginal distribution of X, the unconditional counterfactual distribution of log of debt can be constructed by either replacing the conditional distribution of Vietnamese rural households with the corresponding conditional distribution of the Thai rural households or by substituting marginal distribution of the observed characteristics. In this study, we use rural households in Thailand as the reference group and construct a counterfactual distribution of log of debt, $F_{Y_V}^{c}$, by replacing $F_{Y_V|X}(Y|X = x)$ with $F_{Y_T|X}(Y|X = x)$ in equation (2) when $c = V$:

$$F_{Y_V}^{c}(Y) = \int F_{Y_T|X}(Y|X = x)\,.\,dF_{X_V}(X) \tag{4}$$

The unconditional counterfactual distribution $F_{Y_V}^{c}(Y)$ constitutes the distribution of log of debt that would have prevailed among the Vietnamese rural household if the distribution of characteristics were similar to the Thai rural household.

Following equation (1), the total difference in log of debt between rural households in the two countries can be written as:

$$\Delta_Y = \Delta_\theta + \Delta_X + \Delta_\varepsilon \tag{5}$$

where Δ_θ represents cross-country differences in the θ functions determined by institutional and economic environment in the two countries (i), Δ_X represents differences in the

distribution of observable characteristics of rural households in the two countries (ii), and Δ_ε represents cross-country differences in the distribution of unobservable characteristics (iii). In constructing the unconditional counterfactual distribution of $F_{Y_V}^c$, replacing the conditional distribution of log of debt of the Vietnamese rural households with that of the Thai rural households group replaces both θ and the conditional distribution of ε. Therefore, cross-country difference in θ will be confounded by cross-country differences in the distribution of ε. In order to separate the cross-country differences in ε from the cross-country differences in θ $(and\ X)$, the following two identification restrictions need to be imposed on the distribution of ε (see Fortin et. al, 2011 for detailed discussion of these assumptions).

i. First the overlapping support assumption is imposed to ensure that no single characteristic can identify to which group the rural households belong to (Fortin et al., 2011). This assumption rule out cases where observable and unobservable characteristics in the debt structural model are different for Thai and Vietnamese rural households.
ii. Second the conditional independence/ignorability assumption is imposed to ensure that the conditional distribution of ε given X is the same for rural households in both countries and is independent of their country membership ($\theta \perp \varepsilon | X, c = T, V$).

Under the overlapping support and conditional independence assumptions, the total difference in log of debt between rural households in Thailand and Vietnam, Δ_Y^v (where v represents a distributional statistics of log of debt such as the mean or quantiles), can be separated and identified in an aggregate decomposition as:

$$\Delta_Y^v = \Delta_\theta^v + \Delta_X^v \qquad (6)$$

where $\Delta_\theta^v = v(F_{Y_V} - F_{Y_V}^c)$ captures the part driven by group differences in the log of debt structure (structural or coefficient effect) and $\Delta_X^v = v(F_{Y_V}^c - F_{Y_T})$ captures the part driven by group differences in the distribution of the observed characteristics (composition or endowment effect). The coefficient and covariate effects can further be decomposed into contributions attributable to each characteristic. To perform the detailed decomposition and identify the contributions of each characteristic, further assumptions are required. Since these assumptions are specific to the decomposition methods, they will be discussed further with each estimation procedure explained in the following sub-section.

4.2 Estimation Procedures

4.2.1 Non-linear Decomposition Method

To assess the difference in the prevalence of debt, default and over-indebtedness between rural households in Thailand and Vietnam, we apply an extension of the Oaxaca-Blinder decomposition method for non-linear models elaborated by Fairlie (1999, 2005). This method is especially suitable for calculating gaps for binary variables. This decomposition method computes the difference in the probability of holding debt, defaulting on a loan or becoming over-indebted between the two countries and quantifies the contribution of group differences

in the configuration of characteristics and cultural, institutional and economic environment to the outcome differential.

First, a logit model is estimated for the probability of holding debt, defaulting on a loan and being over-indebted, Y:

$$p_c(Y) = F(X\beta), c \in \{T, V\} \quad (7)$$

Following Fairlie (1999) the gap in the prevalence rate of debt, default and over-indebtedness between rural households in Vietnam and our reference country Thailand can be expressed as:

$$\bar{Y}^T - \bar{Y}^V = \left[\sum_{i=1}^{N^T} \frac{F(X_i^T \hat{\beta}^V)}{N^T} - \sum_{i=1}^{N^V} \frac{F(X_i^V \hat{\beta}^V)}{N^V}\right] + \left[\sum_{i=1}^{N^V} \frac{F(X_i^T \hat{\beta}^T)}{N^T} - \sum_{i=1}^{N^V} \frac{F(X_i^T \hat{\beta}^V)}{N^T}\right] \quad (8)$$

where $\bar{Y}^c$ is the average probability of holding debt, default and over-indebtedness in country c, X^c is a set of average values of the household characteristics in country $c, \hat{\beta}^c$ is the coefficient estimates for country c, F is the cumulative distribution function from a logistic distribution and N^c refers to the sample size in each country. The first expression in the bracket represents the part of the cross-country debt prevalence gap which is driven by differences in the covariate effect (explained part), i.e. by differences in the distribution of X between Vietnam and Thailand. The second term captures the part of the cross-country debt prevalence gap that is driven by the coefficient effect (unexplained part), i.e. to differences in the group processes determining for instance the decision to participate in the credit market in Thailand and Vietnam. This unexplained gap can arise due to differences in cultural differences, institutional differences and other unobservable differences in economic environment between Thailand and Vietnam. Going forward, we will refer to this effect as the "coefficient effect".

The covariate effect is the estimate of the total contribution of the whole vector of household characteristics to the cross-country gap in prevalence of debt, default and over-indebtedness. Using coefficient estimates from a logit regression for a pooled sample, $\hat{\beta}^*$ to avoid the familiar index problem in decomposition methods, the independent contribution of individual covariates can be calculated as follows. For example, the independent contribution of real wealth, X_{RW}, and financial expectation, X_{FE}, to the debt prevalence gap can be expressed as:

$$\frac{1}{N^V}\sum_{i=1}^{N^V} F\left(\hat{\alpha}^* + X_{RWi}^T \hat{\beta}_{RW}^* + X_{FEi}^T \hat{\beta}_{FE}^*\right) - F\left(\hat{\alpha}^* + X_{RWi}^V \hat{\beta}_{RW}^* + X_{FEi}^T \hat{\beta}_{FE}^*\right) \quad (9)$$

$$\frac{1}{N^V}\sum_{i=1}^{N^V} F\left(\hat{\alpha}^* + X_{RWi}^V \hat{\beta}_{RW}^* + X_{FEi}^T \hat{\beta}_{FE}^*\right) - F\left(\hat{\alpha}^* + X_{RWi}^V \hat{\beta}_{RW}^* + X_{FEi}^V \hat{\beta}_{FE}^*\right) \quad (10)$$

Hence, the contribution of each of these variables to the debt prevalence gap is equal to the change in the average predicted probability from replacing the Vietnamese households' distribution with the Thai households' distribution of that variable while holding the contribution of the rest of the variables constant. Then, the sum of the contributions of each independent variable will be equal to total contribution of all of the independent variables estimated using the full sample.

4.2.2 Oaxaca-Blinder Decomposition Method

To compute the level of household debt and indebtedness gap between rural households in Thailand and Vietnam and decompose these gaps into their separate underlying factors, we use the mean-based Oaxaca-Blinder decomposition method. This method is based on the assumption that the relationship between log of debt or indebtedness and a vector of household characteristics is linear and additive:

$$Y_c = X_c\beta_c + \varepsilon_c,\ E(\varepsilon_c) = 0,\ c \in \{T, V\} \tag{11}$$

where X is a vector of explanatory variables, β is a vector of estimated coefficients including the intercept and ε is the error term. Given that $E(\varepsilon_c) = 0$, the total difference in the mean log of debt or over-indebtedness, Δ_Y^{μ} or $\mu\left(F_{Y_V} - F_{Y_T}\right)$, can be decomposed as follow:

$$\Delta_Y^{\mu} = E(Y_V) - E(Y_T) = \underbrace{E(X_V)\beta_V - E(X_V)\beta_T}_{i} + \underbrace{E(X_T)\beta_T - E(X_V)\beta_V}_{ii} \tag{12}$$

where $E(X_V)\beta_T$ is the unconditional counterfactual distribution of log of debt or indebtedness at the mean. As discussed in the identification strategy section, this counterfactual distribution is constructed at the sample means $\mu\left(F_{Y_V}^{C}\right) \rightarrow E(Y)_V^{C} = E(X_V)\beta_T$. The terms i and ii in equation (12) are also analogues to components (i) and (ii) described in the identification strategy section. Rearranging equation (12), we get:

$$\Delta_Y^{\mu} = (E(X_V)[\beta_V - \beta_T]) + ([E(X_V) - E(X_T)]\beta_T) \tag{13}$$

Replacing $E(X_V)$ and $E(X_T)$ by their sample means $\bar{X}_V$ and $\bar{X}_T$, as well as β_V and β_T by their ordinary least square regression estimates, $\hat{\beta}_V$ and $\hat{\beta}_T$, equation (13) can be written as:

$$\hat{\Delta}_Y^{\mu} = \underbrace{\bar{X}_T(\beta_V - \beta_T)}_{\hat{\Delta}_{\theta}^{\mu}} + \underbrace{(\bar{X}_V - \bar{X}_T)\hat{\beta}_T}_{\hat{\Delta}_X^{\mu}} \tag{14}$$

The first term, $\hat{\Delta}_{\theta}^{\mu}$, captures contributions of the coefficient effect to the total differences in log of debt between rural households in Thailand and Vietnam. The second term, $\hat{\Delta}_X^{\mu}$, captures the contributions of the covariate effect i.e. differences in the distribution of mean characteristics. Due to the additive linearity assumption of the Oaxaca-Blinder decomposition method, these two effects can be further decomposed into contributions attributable to each covariate. Then, the total covariate and coefficient effects are simply the sum of the contributions of individual characteristics:

$$\hat{\Delta}_X^{\mu} = \sum_{j=1}^{j}\left(\bar{X}_{Vj} - \bar{X}_{Tj}\right)\hat{\beta}_{Tj} \tag{15}$$

and

$$\hat{\Delta}_{\theta}^{\mu} = \left(\hat{\beta}_{V0} - \hat{\beta}_{T0}\right) + \sum_{j=1}^{j}\left(\hat{\beta}_{Vj} - \hat{\beta}_{Tj}\right)\bar{X}_{Tj} \tag{16}$$

where j represents the jth household characteristics and $\hat{\beta}_{V0}$ and $\hat{\beta}_{T0}$ are the estimated intercept coefficients of the rural households in Vietnam and Thailand respectively.

In the detailed decomposition, identifying the contribution of categorical variables is not easy because the result is not invariant to the choice of the omitted base category. Changing the omitted category alters the contribution of the other categories and the contribution of the entire categorical variable to the coefficient effect. To solve this problem, we use a normalization approach proposed by Yun (2005b). The idea behind this approach is to restrict the coefficients of the individual categories to sum to zero and express the effects as deviations from the grand mean (Jann, 2008). The decompositions results with normalization approach are analogous to the simple average of the results generated from a series of decompositions in which the categories are alternated one after the other as the base category (Yun, 2005b).

4.2.3 Recentered Influence Function Regression Decomposition Method

The distribution of household debt is important in assessing financial market risk and sustainability of household debt. The detailed decomposition of the distribution of household debt gap based on household characteristics such as age, occupation, income and wealth can map vulnerabilities in household debt. Hence, the Recentered Influence Function Regression (RIF-regression) method (Firpo et al., 2009) is additionally used to decompose the level of household debt and indebtedness gap across the two countries and identify the contribution of individual covariates and the economic environment at different quantiles of the unconditional (marginal) distributions. The RIF-regression method is an extension of the Oaxaca-Blinder decomposition method that is based on an unconditional quantile estimator. The RIF-regression method provides a way of estimating the marginal effect of a vector of explanatory variables, X, on the quantiles of the unconditional distribution of a dependent variable, Y. The marginal effects of the explanatory variables are estimated by regressing a transformed version of the dependent variable, known as the recentered influence function (RIF), on X.

The RIF of log of debt and indebtedness is estimated by first calculating the sample quantile q and then estimating the density at that quantile using kernel density methods. The RIF of each observation is then estimated using the following equation:

$$RIF(Y; q_\tau) = q_\tau + \frac{\tau - 1[Y \leq q_\tau]}{f_Y(q_\tau)} \tag{17}$$

Where q_τ is the τth quantile of log of debt and indebtedness and $f_Y(q_\tau)$ is the unconditional density of log of debt and indebtedness at the τth quantile and $1[Y \leq q_\tau]$ is an indicator function for whether the log of debt and indebtedness are less than or equal to the τth quantile. The coefficients of the covariates for the Vietnamese and Thai rural households are then estimated at each quantile by regressing the RIF on X:

$$q_{c\tau} = E_X\left[E\left[\widehat{RIF}(Y_c; q_{c\tau})\middle|X_c\right]\right] = E[X_c]\hat{\gamma}_{c\tau}, c \in \{T, V\} \tag{18}$$

where $q_{c\tau}$ is the unconditional τth quantile of log of debt and indebtedness for rural households in Thailand and Vietnam and $\hat{\gamma}_{c\tau}$ is the coefficient of the vector of covariates from the unconditional quantile regression that captures the marginal effect of a change in the distribution of each covariate on the unconditional log of debt or indebtedness. Equation (18)

is comparable to the Oaxaca-Blinder decomposition at the mean. Therefore, using the same logic as the Oaxaca-Blinder decomposition, the log of debt and indebtedness gap across the two countries at the τth quantile can be decomposed as follows:

$$\Delta_Y^\tau = \left[\widehat{RIF}(Y_V; q_{V\tau})\right] - \left[\widehat{RIF}(Y_T; q_{T\tau})\right] \quad (19)$$

$$\Delta_Y^\tau = \underbrace{\bar{X}_T(\hat{\gamma}_{V\tau} - \hat{\gamma}_{T\tau})}_{\hat{\Delta}_\theta^\tau} + \underbrace{(\bar{X}_V - \bar{X}_T)\hat{\gamma}_{T\tau}}_{\hat{\Delta}_X^\tau} \quad (20)$$

Then, the detailed decomposition of the composition and coefficient effects into contributions of individual covariate at the τth quantile can be computed as:

$$\hat{\Delta}_X^\tau = \sum_{j=1}^{j}(\bar{X}_{Vj} - \bar{X}_{Tj})\hat{\gamma}_{Tj\tau} \quad (21)$$

and

$$\hat{\Delta}_\theta^\tau = (\hat{\gamma}_{V0\tau} - \hat{\gamma}_{T0\tau}) + \sum_{j=1}^{j}(\hat{\gamma}_{Vj\tau} - \hat{\gamma}_{Tj\tau})\,\bar{X}_{Tj\tau} \quad (22)$$

where $(\hat{\gamma}_{V0\tau} - \hat{\gamma}_{T0\tau})$ indicates the omitted group effect, $\bar{X}_{cj\tau}$ and $\hat{\gamma}_{cj\tau}$ indicate the jth element of $\bar{X}_c$ and $\hat{\gamma}_c$ at τth quantile respectively. $(\bar{X}_{Vj} - \bar{X}_{Tj})\hat{\gamma}_{Tj\tau}$ and $(\hat{\gamma}_{Vj\tau} - \hat{\gamma}_{Tj\tau})\bar{X}_{Tj\tau}$ are the respective contributions of the jth covariate to the composition and coefficient effect at τth quantile.

5. Results

5.1. Decomposing the Prevalence of Debt and Over-indebtedness

Table 2 shows the differences in the prevalence of debt and over-indebtedness between rural households in Thailand and Vietnam and their decomposition into covariate and coefficient effects that denote configuration of household and economic environment characteristics effects, respectively. These results are estimated with the Oaxaca-Blinder decomposition method using coefficients from a pooled logit regression models as explained in sub-section 4.2.1. The aggregate decomposition shows that the observed differences in the prevalence of debt and over-indebtedness are largely due to the coefficient effect and always in favor of rural households in Thailand. In other words, the cultural, institutional and economic environment in Thailand appears to be much more conducive to rural households having debt or being over-indebted measured both in terms of defaulting on a loan or having a high debt burden than in Vietnam. If Vietnamese rural households faced the same cultural, institutional and economic environment as their Thai counterparts, the observed gap in the prevalence of debt and over-indebtedness would completely disappear and the Vietnamese households would face the problem of over-indebtedness just the same as their Thai counterparts.

Table 2 here

A detailed decomposition of the coefficient effect for holding debt and being over-indebted according to the DSR indicator, also displayed in table 2, show that the constant term that represents the base category is what mainly generates the positive coefficient effect. In this

study, the omitted category was selected in such a way that it represents rural households that are expected to be economically disadvantaged, i.e. households with the oldest, less educated and single household head whose main income sources is agricultural production and those that have worst financial future expectation and low income and wealth. Hence, the constant term in the decomposition analysis reflects to what extent the prevalence of debt and over-indebtedness among the most economically disadvantaged rural households in Vietnam would differ if they were to face the same cultural, institutional and economic environment as their Thai counterparts. The results reveal that the economically disadvantaged rural households in Thailand are much more likely to participate in the debt market and become over-indebted than their counterparts in Vietnam. This means that the economic environment in Thailand is significantly more conducive for the economically disadvantaged rural households to participate in the debt market and become over-indebted than in Vietnam. This finding is in line with the notion of a higher incidence of debt and over-indebtedness among the poor and vulnerable groups of the population in Thailand that are more likely to face difficulty in repaying their debt, especially when faced with adverse economic conditions (ADB, 2013). Additionally, we note that income is also one factor that contributes significantly to a positive coefficient effect for the difference in the prevalence of over-indebtedness measured with the DSR indicator. This means that at any given amount of household income, the economic environment in Thailand favors having high debt service burden more than in Vietnam. On the other hand, the main factors contributing to a significant coefficient effect for the differences in prevalence of default are adverse shocks and risk preferences.

Looking at the covariate effect, it is estimated to be negative and is significant only in the case of differences in the prevalence of holding debt. This shows that if rural households in Thailand had the same characteristics as the rural households in Vietnam, they would be more likely to participate in the debt market. This implies that the observed higher household debt among rural households in Thailand is not really explained by endowment effects such as higher amount of income or wealth that might reflect a higher capacity to shoulder more debt. Looking further at the detailed decomposition of the covariate effect, it is noticeable that the estimated negative total covariate effect is largely due to age and education level of the household head. The explanation is that since age and level of education are related negatively and positively with holding debt respectively and Vietnamese rural households are younger and more educated than the Thai rural households, their prevalence of debt should be higher indicating a higher demand for debt and higher debt repayment capacity in the future. However, the economic environment effect is so strong that it takes over the opposite effect of the population characteristics. Finally, experiencing adverse shocks significantly reduces the difference while income fluctuation increases the difference. Though experiencing adverse shocks and income fluctuation both increase the likelihood of holding debt, the two factors had a different effect on the covariate effect because their incidence differed among rural households in the two countries (see table 1).

5.2. Decomposing the Amount of Debt Holdings

Table 3 reports the results of the decomposition analysis at the mean using the Oaxaca-Blinder decomposition method. Once again, the results from the Oaxaca-Blinder decomposition show that the coefficient effect largely explains the observed difference in debt

holding indicating that the economic environment in Thailand is generally more favorable to holding higher amount of debt than the economic environment in Vietnam. If the rural households in Vietnam were to face the same economic environment as those in Thailand, the total difference in average log of debt between the households in the two countries would decrease by about 0.497 points (top panel, table 3). Therefore, about 71% of the total difference in average log of conditional amount of debt is explained by differences in the economic environment. According to the detailed decomposition analysis, financial wealth and financial expectation mainly contributed to the estimated positive coefficient effect. This means that for any given amount of financial wealth or type of financial expectation, the economic environment in Thailand is more favorable for rural households to hold higher amount of debt than in Vietnam.

Table 3 here

However, the coefficient effect does not entirely explain the total observed difference in amount of debt holding instead approximately 29% of the difference is attributed to the covariate effect. As can be seen from the detailed decomposition, evidently rural households in Thailand have combination of characteristics that make them more likely to hold larger amounts of debt, particularly income, financial and real wealth reflecting a higher ability to repay debt. Income fluctuation in the previous year also contributed to the positive covariate effect since Thai rural households experienced more income fluctuation in the previous year than those in Vietnam and income fluctuation is positively related with holding higher amount of debt. On the contrary, education contributes significantly to a negative covariate effect implying that on average Vietnamese rural households are more educated than their Thai counterparts and education is positively related with holding higher amount of debt. Overall, rural households in Thailand have configuration of characteristics, such as better endowments, and an economic environment that's conducive to holding higher amounts of debt and hence have higher amounts of debt outstanding than rural households in Vietnam.

Having reviewed findings from the decomposition analysis at the mean, we now move on to the results from RIF-regression decomposition method to get deeper insights into the factors that explain the observed debt holding differential. Results from the RIF-regression decomposition analysis at different percentiles of the conditional debt distribution are presented in table 4. At the aggregate level, we can see that the cross-country difference in debt holding increases along the debt distribution. Interestingly, the observed difference in log of debt holding attributable to the covariate and coefficient effect also differs along the debt distribution. Evidently, from the lowest percentile up to the median, the covariate effect or differences in composition of rural households' characteristics positively and significantly explain the observed cross-country difference in the amount of debt holding. This means that up to the median, differences in the distribution of household characteristics accounts for the large portion of the difference between rural households' debt in Thailand and Vietnam. In contrast, from the median onwards, the covariate effect becomes insignificant reflecting that the distribution of households' characteristics such as higher endowments do not actually explain the higher amount of debt holding observed for rural households in Thailand in the top percentiles. Instead, the difference in debt holding beyond the median debt is fully explained by the coefficient effect. This indicates that the economic environment is what

mainly contributes to the higher amount of debt holding observed among rural households in Thailand.

Table 4 here

The detailed decomposition further explains these observed differences by capturing the contribution of each characteristic to the estimated log of debt equations. We find that, similar to the results at the mean, income, financial wealth, real wealth and income fluctuation mainly explain the estimated positive covariate effect at the lower percentile of the debt distribution. This suggests that the Thai rural households had higher endowments that explain the higher amount of debt they hold especially at the lower tail of the debt distribution. Turning to the coefficient effects at the top percentiles of the debt distribution, again the detailed decomposition shows that income, financial and real wealth are the key significant contributors to the estimated positive effect. If we interpret the coefficient effect as capturing the economic environment then this finding suggests that Vietnamese rural households would have higher amount of debt if they were to experience the economic environment that Thai rural households with comparable level of income, financial and real wealth face.

In summary, the findings from the RIF-regression decomposition analysis are broadly consistent with the results from the decomposition analysis at the mean, while adding the key insight into the varying role of the coefficient and covariate effect at the different points of the debt distribution. In the case of higher amount of debt observed at the lower tail of the debt distribution, better endowments explain the gap reflecting that Thai households possess resources that indicate a higher demand for debt and capacity to bear higher debt burden. On the other hand, in the upper tail of the debt distribution, the high debt gap between rural households in Vietnam and Thailand is overwhelmingly explained by differences in the economic environment, with this differences widening at higher debt levels.

5.3. Decomposing the Indebtedness Indicators

According to the findings from the RIF-regression decomposition analysis, the higher amount of debt observed among rural households in Thailand is partly due to having better resources that might make them more capable of servicing their debt and less likely to face high debt burden. Hence, we further look into differences in debt burden using the common DSR, DIR and DAR indicators of indebtedness.

At the aggregate level we can see that rural households in Thailand on average have a higher debt burden or level of indebtedness even though they tend to have higher income and wealth compared to rural households in Vietnam (see table 3). This observed gap in debt burden is largely attributable to differences in the economic environment regardless of the indicator used. Looking further at the detailed decompositions, table 3 shows that financial wealth has a strong and positive effect on the difference in indebtedness levels using all three indicators through the coefficient effect. The reason behind this finding could be that saving secured loans are common in Thailand and hence amount of saving households have determines the amount of debt they take out by signaling better repayment capacity. Especially for group loans in Thailand, the maximum amount of loan households can borrow might depend on the accumulated amount of savings they have at the village bank (Coleman, 1999). Furthermore

focusing on the DSR and DAR indicators, it is clear that the economic environment in Thailand is again more tolerant to the economically disadvantaged rural households to bear higher debt burden than in Vietnam as showed by the positive significant constant.

Turning to the covariate effect, we can see that configuration of the rural households characteristics in Thailand explains about 37% and 25% of the observed difference in level of indebtedness using the DSR and DIR indicators respectively (see table 3). The key factors that contribute to the positive covariate are again financial and real wealth and are in favor of those in Thailand. In general, these findings are in line with the findings from the decomposition analysis of the log of debt. Additionally, financial expectation and risk preferences explain the higher level of indebtedness among rural households in Thailand in terms of the DIR indicator (see table 3). Since being a risk taker and having a worst future financial expectation is associated to facing higher debt burden, a positive significant contribution to the covariate effect means that more of the Thai households have these characters making them more disposed to higher debt burdens. In the case of the DAR, the covariate effect is negative indicating that rural households in Vietnam have characteristics that make them more likely to experience higher level of debt burden. However, given the favorable economic environment in Thailand that is more tolerant to rural households having higher debt burdens than in Vietnam, the negative covariate effect is neutralized.

Tables 5, 6 and 7 present the RIF-regression decomposition results at different percentiles of the indebtedness distribution for the three indebtedness indicators. In general, the difference in the level of indebtedness increases when going along the indebtedness indicators distribution and the coefficient effect explains larger portion of the difference especially at the upper tail of the distribution. Turning to the specific results from the detailed decomposition for the DSR indicator, table 5 presents financial and real wealth as the key individual contributors to both the coefficient and covariate effects. This suggests that rural households in Thailand have higher amount of financial and real wealth that explain their need and capacity to bear higher amount debt relative to their income and also at any given level of wealth the economic environment in Thailand is more tolerant to rural households holding high level of indebtedness. Another notable finding is again that the economic environment in Thailand allows the economically disadvantaged group of rural households to get into high debt burden situation as shown by the high positive significant estimate of the constant term.

According to the detail decomposition analysis of the DIR indicator, table 6 also shows that the key individual covariates that contribute to the positive estimated coefficient effects are again financial and real wealth. While financial wealth explains the observed cross-country difference in level of indebtedness at the lower distribution of the DIR, real wealth is the factor that largely explains the high difference in debt burden observed at the top 90^{th} percentile. The reason for the positive effect of these two individual covariates to the coefficient effect could be that both financial and real wealth are used more to secure loans than in Vietnam, or to assess future repayment capacity of rural households. Additionally, the main occupation of the household head also contributes positively to the coefficient effect at the top part of the DIR distribution. The underlying mechanism of this effect can be explained as follows.Having a self-employed household head is associated to facing higher debt burden compared to those that have a household head involved in agricultural production. Hence, the

positive coefficient effect from occupation means that the economic environment in Thailand is particularly lenient to higher debt burden for the rural households with self-employed household heads than the economic environment in Vietnam.

Moving on to the coefficient effect for the DAR indicator presented in table 7, once more this effect fully explains the observed cross-country difference in indebtedness and also neutralizes the negative covariate effect that is in favor of rural households in Vietnam facing higher debt burden throughout the DAR distribution. Table 7 further presents the detailed decomposition that shows income and financial wealth as the factors that contribute to the positive coefficient effect throughout the DAR distribution while at the middle and higher level of the distribution occupation and household size partly explain the cross-country difference in debt burden. Another finding worth noting from the DAR indicator is that the economic environment is less conducive to higher debt burden for the economically disadvantaged groups in Thailand at the lower tail of the debt distribution, while at the top 90^{th} percentile the economic environment is more conducive to higher debt burden for economically disadvantaged groups in Thailand.

Covariate effects also play a statistically significant role although the direction of the effect varies depending on the indebtedness indicator used (see table 5, 6 and 7). For DSR and DIR indicators, the covariate effect is estimated to be positively significant indicating that rural households in Thailand have configuration of characteristics that make them assume larger level of debt burden than what is observed for rural households in Vietnam, especially at the lower tail of the distribution. The key characters that explain this positive effect are financial and real wealth, financial expectation, income fluctuation and risk preferences. Other characters such as age, education and income contribute negatively to the covariate effect showing that Vietnamese rural households for instance have younger and more educated household heads that should make them more prone to face higher debt burdens than Thai households as these characters are associated with higher debt burden.

On the contrary, for the DAR indicator, the covariate effect has generally a negative impact on the cross-country debt burden gap, with a particularly sizable effect at the top percentiles. This means that if it were for the composition of household characteristics, the Vietnamese rural households would have had higher level of debt burden than what is observed. According to the detailed decomposition the main contributor to this negative effect is education. However, the difference in the economic environment is so strong that it prevails over the opposite influence of the covariate effect and hence the observed higher debt burden for rural households in Thailand.

To sum up, the findings from the decomposition analysis of the three indebtedness indicators suggests that rural households in Thailand face significantly higher level of indebtedness compared to rural households in Vietnam. The main explanation for this observed cross-country debt burden gap is the economic environment in Thailand which is more liberal in borrowing conditions and more tolerant towards high level of indebtedness of rural households.

6. Conclusions

Our paper has several findings which we believe are important for development policy in emerging market economies. First, there is higher prevalence of debt and over-indebtedness among rural households in Thailand as compared to Vietnam. Second, households in Thailand hold larger amounts of debt and face higher level of indebtedness as compared to similar type of households in Vietnam. Third, these differences arise due to variation in the economic conditions between the two countries and not because of differences in household characteristics. For the economically disadvantaged rural households, the credit market conditions in Thailand are more lenient to borrowing as compared to Vietnam. Most importantly, the gap in debt holding and indebtedness increase significantly when moving up the debt distribution. The same is true for the factors that explain these differences. At the lower tail of the distributions, differences in household characteristics matter for Thai households while at the upper part of the distribution, differences in the economic environment explain the gap. The paper thus gives some indication about the impact of a possible further liberalization of the credit market in Vietnam.

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Table 1: Average household characteristics by country in 2008 and 2010

	Vietnam	Thailand
Age of HH head below 39	0.214	0.067
	(0.411)	(0.252)
Age of HH head 40-49	0.306	0.241
	(0.461)	(0.428)
Age of HH head 50-59	0.235	0.268
	(0.424)	(0.443)
Age of HH head 60 and above	0.245	0.424
	(0.430)	(0.490)
Female HH head	0.209	0.335
	(0.407)	(0.472)
Married HH head	0.852	0.782
	(0.355)	(0.413)
Household size	5.276	5.490
	(1.946)	(2.210)
Illiterate	0.113	0.045
	(0.32)	(0.210)
Primary education	0.317	0.843
	(0.465)	(0.364)
Secondary education	0.513	0.0936
	(0.500)	(0.292)
Higher education	0.057	0.0184
	(0.232)	(0.135)
Agricultural HH	0.665	0.606
	(0.472)	(0.489)
Self-employed HH	0.0751	0.082
	(0.264)	(0.274)
Off-farm employed HH	0.209	0.184
	(0.407)	(0.387)
Inactive HH	0.0509	0.128
	(0.220)	(0.330)
Income quintile 1	0.307	0.200
	(0.460)	(0.400)
Income quintile 2	0.234	0.200
	(0.423)	(0.400)
Income quintile 3	0.183	0.200
	(0.387)	(0.400)
Income quintile 4	0.169	0.200
	(0.375)	(0.400)
Income quintile 5	0.107	0.200
	(0.309)	(0.400)
Financial wealth quintile 1	0.663	0.215
	(0.47)	(0.410)
Financial wealth quintile 2	0.015	0.185
	(0.123)	(0.388)
Financial wealth quintile 3	0.0687	0.199

	(0.253)	(0.399)
Financial wealth quintile 4	0.0993	0.201
	(0.299)	(0.401)
Financial wealth quintile 5	0.154	0.200
	(0.361)	(0.400)
Real wealth quintile 1	0.286	0.200
	(0.450)	(0.400)
Real wealth quintile 2	0.287	0.200
	(0.452)	(0.401)
Real wealth quintile 3	0.180	0.200
	(0.384)	(0.400)
Real wealth quintile 4	0.119	0.200
	(0.323)	(0.400)
Real wealth quintile 5	0.128	0.200
	(0.334)	(0.400)
Income fluctuation (t-1)	0.613	0.681
	(0.487)	(0.466)
Unexpected shocks to expense	0.454	0.372
	(0.498)	(0.483)
Expected shocks to expense	0.119	0.0966
	(0.324)	(0.295)
Unexpected shocks to income	0.616	0.406
	(0.486)	(0.491)
Better future financial expectation	0.506	0.513
	(0.500)	(0.500)
Same future financial expectation	0.421	0.375
	(0.494)	(0.484)
Worst future financial expectation	0.073	0.112
	(0.260)	(0.320)
Risk averse	0.523	0.352
	(0.500)	(0.478)
Risk neutral	0.197	0.416
	(0.398)	(0.493)
Risk taker	0.28	0.232
	(0.450)	(0.420)
Observations	2024	2091

Table 2: Decomposition of differences in the prevalence of debt and over-indebtedness in 2008

	Debt	DSR>40%	Default
Overall			
Thailand	0.817***	0.427***	0.111***
	(0.01)	(0.01)	(0.01)
Vietnam	0.662***	0.113***	0.056***
	(0.01)	(0.01)	(0.00)
Total difference	0.155***	0.314***	0.055***
	(0.01)	(0.01)	(0.01)
Covariate effect	-0.033***	-0.009	-0.004
	(0.01)	(0.02)	(0.01)
Coefficient effect	0.188***	0.324***	0.059***
	(0.01)	(0.02)	(0.01)
Covariate effect			
Female	-0.001	0.003	-0.002
	(0.00)	(0.00)	(0.01)
Age	-0.015***	-0.015**	-0.003
	(0.00)	(0.01)	(0.01)
Education	-0.010*	-0.021	0.017
	(0.01)	(0.01)	(0.05)
Married	-0.001	-0.001	-0.000
	(0.00)	(0.00)	(0.00)
HH size	0.003***	0.002**	0.004
	(0.00)	(0.00)	(0.01)
Occupation	-0.001	0.002	0.003
	(0.00)	(0.00)	(0.01)
Income	-0.001	0.004	0.000
	(0.00)	(0.00)	(0.00)
wealth	-0.003	0.023***	-0.016
	(0.00)	(0.00)	(0.03)
Financial expectation	-0.001	0.001	0.003
	(0.00)	(0.00)	(0.01)
Adverse shocks	-0.007***	-0.008*	-0.011
	(0.00)	(0.00)	(0.02)
Income fluctuation *(t-1)*	0.006***	0.004*	0.009
	(0.00)	(0.00)	(0.02)
Risk preference	-0.001	-0.003	-0.008
	(0.00)	(0.00)	(0.02)
Coefficient effect			
Female	-0.020**	-0.015*	0.001
	(0.01)	(0.01)	(0.01)
Age	-0.032	0.017	-0.042**
	(0.02)	(0.03)	(0.02)

Education	-0.020	-0.043	0.029
	(0.04)	(0.04)	(0.02)
Married	-0.040	-0.059	-0.007
	(0.04)	(0.04)	(0.03)
HH size	-0.074*	0.022	-0.012
	(0.04)	(0.04)	(0.02)
Occupation	0.000	-0.007	0.004
	(0.01)	(0.01)	(0.01)
Income	0.023	0.096***	0.023
	(0.03)	(0.03)	(0.02)
wealth	0.030	-0.026	-0.003
	(0.02)	(0.02)	(0.01)
Financial expectation	-0.064	-0.051	-0.019
	(0.04)	(0.05)	(0.03)
Adverse shocks	-0.042**	0.010	0.023*
	(0.02)	(0.02)	(0.01)
Income fluctuation *(t-1)*	0.002	-0.024	0.018
	(0.02)	(0.02)	(0.01)
Risk preference	-0.038	-0.098***	0.029*
	(0.03)	(0.03)	(0.02)
Constant	0.462***	0.501***	0.013
	(0.09)	(0.10)	(0.06)
Observations	4211	4211	4211

Notes:

1. Results are from decomposition analyses that compare the prevalence of debt and over-indebtedness among rural households in Vietnam to those in Thailand using coefficients from pooled logit regression models.
2. Results are based on the Oaxaca-Blinder Decomposition Method.
3. Numbers in brackets represent standard errors.
4. *, **, & *** represent statistical significance at the 10%, 5%, & 1% level respectively.

Table 3: Decomposition of differences in average log of debt, DSR, DIR and DAR in 2008

	Amount of Debt	DSR	DIR	DAR
Overall				
Thailand	8.133***	48.346***	106.224***	17.956***
	(0.03)	(1.34)	(2.96)	(0.64)
Vietnam	7.436***	15.590***	63.779***	11.861***
	(0.03)	(0.77)	(2.11)	(0.43)
Total difference	0.697***	32.755***	42.445***	6.095***
	(0.04)	(1.54)	(3.63)	(0.77)
Covariate effect	0.200***	12.303***	10.881**	-2.805**
	(0.07)	(2.16)	(5.43)	(1.14)
Coefficient effect	0.497***	20.452***	31.564***	8.900***
	(0.08)	(2.46)	(6.22)	(1.33)
Covariate effect				
Female	0.001	0.244	-0.764	-0.135
	(0.01)	(0.28)	(0.66)	(0.14)
Age	0.016	-0.199	-0.798	0.311
	(0.01)	(0.41)	(1.08)	(0.25)
Education	-0.171***	-1.838**	-5.655***	-2.490***
	(0.03)	(0.89)	(2.19)	(0.53)
Married	-0.010*	-0.383**	-0.159	-0.083
	(0.01)	(0.18)	(0.48)	(0.10)
HH size	0.001	0.074	-0.014	0.015
	(0.00)	(0.07)	(0.15)	(0.03)
Occupation	0.012	0.109	0.793	0.206
	(0.01)	(0.21)	(0.65)	(0.15)
Income	0.021***	-0.691	-1.005	0.184**
	(0.01)	(0.51)	(1.49)	(0.09)
Financial wealth	0.164***	12.115***	10.967**	1.697*
	(0.06)	(1.61)	(4.27)	(0.87)
Real wealth	0.166***	3.006***	6.341***	-2.979***
	(0.02)	(0.50)	(1.17)	(0.35)
Financial expectation	-0.001	-0.043	1.716*	0.049
	(0.01)	(0.34)	(0.91)	(0.21)
Adverse shocks	-0.013	-0.459	-2.839***	-0.094
	(0.01)	(0.35)	(0.94)	(0.21)
Income fluctuation *(t-1)*	0.011**	0.285	0.513*	0.170**
	(0.00)	(0.18)	(0.30)	(0.08)
Risk preference	0.003	0.081	1.787*	0.343
	(0.01)	(0.40)	(1.02)	(0.21)
Coefficient effect				
Female	-0.008	-0.917	-2.949	-1.120**
	(0.03)	(1.01)	(2.23)	(0.50)

Age	-0.045	1.457	-0.982	-0.641
	(0.09)	(2.76)	(6.61)	(1.49)
Education	0.092	-1.946	7.409	2.331
	(0.15)	(6.36)	(13.69)	(2.76)
Married	0.055	-1.164	-0.753	-1.949
	(0.12)	(3.91)	(10.24)	(2.21)
HH size	0.103	-0.590	-1.014	4.366*
	(0.12)	(3.78)	(11.43)	(2.23)
Occupation	0.046	-0.502	1.102	0.758
	(0.03)	(1.14)	(2.51)	(0.61)
Income	-0.121	-17.249***	-6.301	0.297
	(0.10)	(5.41)	(12.47)	(2.03)
Financial wealth	0.179***	7.400***	10.766***	2.167***
	(0.04)	(1.56)	(3.48)	(0.67)
Real wealth	-0.093	4.436	-8.637	-7.298***
	(0.08)	(3.12)	(7.18)	(1.91)
Financial expectation	0.248*	-3.278	14.408	3.060
	(0.15)	(4.40)	(10.87)	(2.56)
Adverse shocks	-0.097	2.604	-1.871	-1.515
	(0.06)	(1.93)	(4.75)	(0.98)
Income fluctuation *(t-1)*	-0.012	0.127	-2.637	0.319
	(0.06)	(1.82)	(4.42)	(0.95)
Risk preference	-0.118	-12.082***	-4.558	-1.524
	(0.08)	(2.91)	(6.89)	(1.47)
Constant	0.267	42.155***	27.581	9.649*
	(0.31)	(11.02)	(27.09)	(5.49)
Observations	3117	3975	3141	3397

Notes:

1. Results are from decomposition analyses that compare the average amount of debt, DSR, DIR and DAR of rural households in Vietnam to those in Thailand using coefficients from pooled linear regression models.
2. Outstanding amount of debt is conditional on participation in debt markets.
3. Results are based on the Oaxaca-Blinder decomposition method.
4. Numbers in brackets represent standard errors.
5. *, **, & *** represent statistical significance at the 10%, 5%, & 1% level respectively.

Table 4: Decomposition of differences in log of debt at the 10th, 25th, 50th, 75th and 90th percentiles in 2008

	Log of debt				
	10th	25th	50th	75th	90th
Overall					
Thailand	6.509***	7.188***	8.064***	8.905***	9.880***
	(0.06)	(0.05)	(0.04)	(0.05)	(0.08)
Vietnam	6.138***	6.896***	7.518***	8.154***	8.707***
	(0.06)	(0.03)	(0.04)	(0.04)	(0.05)
Total difference	0.371***	0.292***	0.546***	0.751***	1.173***
	(0.08)	(0.06)	(0.05)	(0.06)	(0.09)
Covariate effect	0.280*	0.209**	0.221***	0.130	-0.048
	(0.15)	(0.10)	(0.08)	(0.09)	(0.14)
Coefficient effect	0.090	0.083	0.325***	0.621***	1.221***
	(0.18)	(0.11)	(0.09)	(0.10)	(0.16)
Covariate effect					
Female	-0.023	-0.002	-0.000	0.008	0.006
	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
Age	0.046	0.013	0.021	0.003	-0.014
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)
Education	-0.173***	-0.161***	-0.128***	-0.122***	-0.266***
	(0.05)	(0.03)	(0.03)	(0.04)	(0.07)
Married	-0.008	-0.017*	-0.008	-0.013*	-0.012
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
HH size	0.001	0.001	0.001	0.000	0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Occupation	0.009	0.010	0.018**	0.023**	0.016
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Income	0.018**	0.014**	0.015**	0.022**	0.029**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial wealth	0.323***	0.215***	0.143**	0.026	-0.081
	(0.13)	(0.08)	(0.06)	(0.07)	(0.11)
Real wealth	0.112***	0.118***	0.147***	0.182***	0.243***
	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)
Financial expectation	-0.005	0.004	0.001	-0.003	-0.007
	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Adverse shocks	-0.054**	-0.011	-0.009	-0.010	0.014
	(0.02)	(0.02)	(0.01)	(0.02)	(0.03)
Income fluctuation *(t-1)*	0.017**	0.011*	0.007	0.011*	0.014
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Risk preference	0.015	0.015	0.013	0.002	0.009
	(0.02)	(0.02)	(0.01)	(0.02)	(0.03)
Coefficient effect					
Female	-0.027	-0.012	-0.046	0.012	0.061

	(0.05)	(0.04)	(0.03)	(0.04)	(0.05)
Age	-0.085	-0.041	0.074	-0.008	-0.234
	(0.18)	(0.12)	(0.11)	(0.12)	(0.16)
Education	-0.156	0.052	-0.143	0.122	0.443
	(0.35)	(0.24)	(0.19)	(0.21)	(0.31)
Married	0.036	0.235	-0.119	0.158	0.302
	(0.26)	(0.17)	(0.14)	(0.16)	(0.23)
HH size	-0.221	-0.006	0.078	-0.007	0.336
	(0.24)	(0.16)	(0.14)	(0.18)	(0.27)
Occupation	0.008	-0.007	0.039	0.070	0.227***
	(0.06)	(0.04)	(0.04)	(0.04)	(0.07)
Income	0.091	-0.005	0.097	0.144	1.540*
	(0.75)	(0.50)	(0.46)	(0.53)	(0.87)
Financial wealth	0.347***	0.251***	0.121**	0.137**	0.058
	(0.10)	(0.06)	(0.05)	(0.06)	(0.09)
Real wealth	-0.528	0.534	0.149	0.577	2.747**
	(1.18)	(0.76)	(0.67)	(0.79)	(1.20)
Financial expectation	0.313	0.302*	0.439***	0.196	0.403
	(0.27)	(0.17)	(0.16)	(0.17)	(0.25)
Adverse shocks	-0.053	-0.038	-0.064	-0.101	0.035
	(0.12)	(0.09)	(0.08)	(0.09)	(0.13)
Income fluctuation *(t-1)*	0.047	-0.016	0.066	-0.109	-0.050
	(0.11)	(0.08)	(0.07)	(0.08)	(0.12)
Risk preference	-0.167	-0.181*	0.007	-0.195*	-0.164
	(0.15)	(0.11)	(0.09)	(0.11)	(0.18)
Constant	0.484	-0.985	-0.372	-0.373	-4.484***
	(1.27)	(0.80)	(0.68)	(0.79)	(1.33)
Observations	3005	3005	3005	3005	3005

Notes:

1. Results are from decomposition analyses that compare the distribution of amount of debt of rural households in Vietnam to those in Thailand using coefficients from pooled linear regression models.
2. Outstanding amount of debt is conditional on participation in debt markets.
3. Results are based on the RIF-Regression decomposition method.
4. Numbers in brackets represent standard errors.
5. *, **, & *** represent statistical significance at the 10%, 5%, & 1% level respectively.

Table 5: Decomposition of differences in DSR distribution at the 50th, 75th and 90th percentiles in 2008

	Debt service to income ratio		
	50th	75th	90th
Overall			
Thailand	29.400***	70.269***	139.900***
	(1.37)	(2.44)	(3.53)
Vietnam	1.732***	14.730***	44.104***
	(0.22)	(1.17)	(2.26)
Total difference	27.668***	55.539***	95.796***
	(1.39)	(2.70)	(4.19)
Covariate effect	12.502***	16.135***	18.237***
	(1.95)	(3.61)	(5.57)
Coefficient effect	15.166***	39.404***	77.560***
	(2.32)	(4.20)	(6.42)
Covariate effect			
Female	-0.065	0.097	0.138
	(0.26)	(0.48)	(0.71)
Age	-1.061***	-1.539**	1.267
	(0.36)	(0.72)	(1.13)
Education	-1.226	-1.505	-3.869
	(0.76)	(1.57)	(2.47)
Married	-0.135	-0.566*	-0.615
	(0.16)	(0.29)	(0.43)
HH size	0.170*	0.089	0.068
	(0.09)	(0.12)	(0.18)
Occupation	0.221	0.057	-0.211
	(0.21)	(0.38)	(0.55)
Income	-0.787**	-2.110***	-3.720***
	(0.31)	(0.81)	(1.43)
Financial wealth	14.029***	16.427***	16.075***
	(1.58)	(2.74)	(4.19)
Real wealth	2.289***	5.062***	9.490***
	(0.42)	(0.86)	(1.41)
Financial expectation	0.387	-0.429	-0.152
	(0.32)	(0.60)	(0.91)
Adverse shocks	-0.806**	-0.090	-1.422
	(0.33)	(0.64)	(0.99)
Income fluctuation *(t-1)*	0.145	0.372	0.464
	(0.17)	(0.33)	(0.50)
Risk preference	-0.660*	0.272	0.724
	(0.38)	(0.72)	(1.09)
Coefficient effect			
Female	-0.998	-0.918	-5.291**

	(0.83)	(1.66)	(2.67)
Age	5.703**	2.380	-6.146
	(2.27)	(4.46)	(7.37)
Education	1.171	-2.438	-22.646
	(5.40)	(9.58)	(17.10)
Married	0.109	1.180	-4.562
	(3.24)	(6.30)	(10.30)
HH size	7.320**	-4.297	-17.428
	(3.28)	(6.74)	(10.70)
Occupation	0.464	-0.045	-1.021
	(1.06)	(2.08)	(3.15)
Income	-136.192***	-236.540***	-228.663***
	(12.74)	(25.62)	(48.45)
Financial wealth	9.193***	13.515***	11.377***
	(1.40)	(2.55)	(4.09)
Real wealth	83.035***	91.632**	107.448*
	(18.09)	(36.82)	(58.35)
Financial expectation	-5.271*	-6.268	-10.526
	(3.19)	(6.89)	(11.49)
Adverse shocks	2.569	2.808	3.778
	(1.79)	(3.56)	(5.41)
Income fluctuation *(t-1)*	-0.697	-2.494	-2.548
	(1.70)	(3.32)	(5.10)
Risk preference	-8.213***	-23.234***	-23.562***
	(2.65)	(5.28)	(7.88)
Constant	56.975***	204.121***	277.349***
	(18.69)	(37.36)	(57.35)
Observations	3997	3997	3997

Notes:

1. Results are from decomposition analyses that compare the distribution of debt service to income ratio of rural households in Vietnam to those in Thailand using coefficients from pooled RIF-regression models.
2. Results are based on the RIF-Regression decomposition method.
3. Numbers in brackets represent standard errors.
4. *, **, & *** represent statistical significance at the 10%, 5%, & 1% level respectively.

Table 6: Decomposition of differences in DIR distribution at the 25th, 50th, 75th and 90th percentiles in 2008

	Debt to income ratio			
	25th	50th	75th	90th
Overall				
Thailand	22.598***	63.754***	156.412***	308.169***
	(1.33)	(1.90)	(7.31)	(3.62)
Vietnam	13.661***	35.265***	83.267***	161.139***
	(0.87)	(1.67)	(3.30)	(1.60)
Total difference	8.937***	28.489***	73.145***	147.030***
	(1.59)	(2.53)	(8.02)	(3.96)
Covariate effect	5.206*	5.977	18.250	7.918
	(2.66)	(3.82)	(12.63)	(6.18)
Coefficient effect	3.731	22.512***	54.895***	139.113***
	(3.16)	(4.44)	(14.23)	(6.88)
Covariate effect				
Female	-0.335	-0.912*	-0.633	-0.416
	(0.32)	(0.47)	(1.55)	(0.79)
Age	0.028	-0.119	-0.327	-0.068
	(0.52)	(0.78)	(2.48)	(1.24)
Education	-1.929*	-5.456***	-13.356***	-5.129**
	(1.00)	(1.55)	(4.87)	(2.42)
Married	-0.060	-0.188	-0.991	-0.085
	(0.23)	(0.33)	(1.11)	(0.55)
HH size	-0.001	-0.001	-0.009	-0.009
	(0.02)	(0.02)	(0.20)	(0.21)
Occupation	-0.244	0.464	1.863	0.559
	(0.31)	(0.43)	(1.54)	(0.74)
Income	-0.647*	-1.853*	-5.883*	-2.498*
	(0.34)	(0.95)	(3.02)	(1.29)
Financial wealth	6.851***	8.129***	24.597**	8.069
	(2.19)	(2.99)	(10.09)	(5.04)
Real wealth	0.622	4.377***	13.542***	6.624***
	(0.48)	(0.78)	(2.66)	(1.39)
Financial expectation	0.028	1.250**	2.628	2.411**
	(0.41)	(0.62)	(2.12)	(1.09)
Adverse shocks	-0.601	-0.590	-4.582**	-3.224***
	(0.43)	(0.65)	(2.22)	(1.11)
Income fluctuation *(t-1)*	0.330**	0.457**	0.251	0.284
	(0.16)	(0.23)	(0.69)	(0.34)
Risk preference	1.163**	0.418	1.149	1.400
	(0.45)	(0.67)	(2.34)	(1.20)
Coefficient effect				

Female	-1.054	-2.709*	-4.399	-2.358
	(1.02)	(1.60)	(4.67)	(2.42)
Age	-3.399	0.854	-0.402	4.880
	(3.19)	(4.87)	(14.82)	(7.48)
Education	5.577	1.239	44.490	-1.243
	(6.55)	(8.95)	(29.04)	(16.14)
Married	0.496	0.449	-2.485	-8.074
	(4.49)	(7.03)	(20.19)	(10.50)
HH size	-1.330	-9.695	-18.956	17.494
	(4.40)	(7.12)	(22.44)	(12.34)
Occupation	-1.177	0.568	11.637**	5.094*
	(1.20)	(1.79)	(5.75)	(2.81)
Income	-10.327	47.608*	-254.708***	-133.948***
	(17.55)	(24.60)	(81.42)	(47.62)
Financial wealth	5.637***	10.360***	26.581***	6.070
	(1.80)	(2.63)	(7.47)	(3.75)
Real wealth	14.667	-17.652	157.170	148.682**
	(22.07)	(33.59)	(111.70)	(59.07)
Financial expectation	1.324	14.433*	40.723*	6.215
	(4.46)	(7.74)	(21.81)	(11.85)
Adverse shocks	-3.546	-2.977	13.713	3.395
	(2.32)	(3.55)	(10.85)	(5.31)
Income fluctuation *(t-1)*	0.577	-5.594*	-12.412	6.201
	(2.13)	(3.22)	(10.22)	(5.00)
Risk preference	-2.384	-0.792	-8.104	-7.051
	(3.06)	(4.64)	(15.08)	(7.63)
Constant	-1.329	-13.582	62.047	93.755
	(22.22)	(34.35)	(116.68)	(62.45)
Observations	3176	3176	3176	3176

Notes:

1. Results are from decomposition analyses that compare the distribution of amount of outstanding debt to income ratio of rural households in Vietnam to those in Thailand using coefficients from pooled RIF-regression models.
2. Results are based on the RIF-Regression decomposition method.
3. Numbers in brackets represent standard errors.
4. *, **, & *** represent statistical significance at the 10%, 5%, & 1% level respectively.

Table 7: Decomposition of differences in DAR distribution at the 25th, 50th, 75th and 90th percentiles in 2008

	Debt to asset ratio			
	25th	50th	75th	90th
Overall				
Thailand	2.963***	8.229***	19.669***	44.793***
	(0.17)	(0.44)	(0.75)	(2.64)
Vietnam	2.349***	6.425***	13.832***	27.891***
	(0.17)	(0.25)	(0.58)	(1.14)
Total difference	0.614**	1.803***	5.837***	16.902***
	(0.24)	(0.50)	(0.94)	(2.88)
Covariate effect	-0.428	-1.325*	-4.797***	-17.612***
	(0.38)	(0.79)	(1.37)	(4.74)
Coefficient effect	1.042**	3.128***	10.635***	34.514***
	(0.45)	(0.90)	(1.56)	(5.65)
Covariate effect				
Female	-0.028	-0.041	-0.392**	-0.805
	(0.04)	(0.10)	(0.18)	(0.55)
Age	-0.008	-0.101	-0.076	-0.044
	(0.08)	(0.16)	(0.28)	(0.90)
Education	-0.526***	-1.149***	-2.947***	-8.531***
	(0.15)	(0.30)	(0.60)	(1.96)
Married	-0.016	-0.074	0.006	0.008
	(0.03)	(0.07)	(0.12)	(0.40)
HH size	0.007	0.009	0.008	0.051
	(0.02)	(0.02)	(0.02)	(0.12)
Occupation	0.014	0.209**	0.346*	0.178
	(0.04)	(0.10)	(0.18)	(0.56)
Income	0.020	0.063	0.126	0.362
	(0.02)	(0.06)	(0.11)	(0.32)
Financial wealth	0.870***	1.959***	2.207**	1.187
	(0.30)	(0.63)	(1.03)	(3.54)
Real wealth	-0.871***	-2.388***	-4.431***	-11.024***
	(0.09)	(0.22)	(0.42)	(1.32)
Financial expectation	-0.025	0.244*	0.044	0.508
	(0.06)	(0.13)	(0.23)	(0.77)
Adverse shocks	-0.054	-0.113	0.070	-0.883
	(0.06)	(0.13)	(0.24)	(0.79)
Income fluctuation *(t-1)*	0.042*	0.095*	0.162*	0.350
	(0.02)	(0.05)	(0.09)	(0.27)
Risk preference	0.146**	-0.039	0.080	1.033
	(0.06)	(0.14)	(0.25)	(0.85)

Coefficient effect				
Female	-0.011	-0.242	-1.235**	-2.141
	(0.16)	(0.30)	(0.58)	(1.63)
Age	-0.190	0.364	-1.983	-0.106
	(0.49)	(0.92)	(1.69)	(5.04)
Education	0.232	4.001**	2.211	1.295
	(0.89)	(1.88)	(3.21)	(11.49)
Married	0.075	0.697	-0.750	-7.621
	(0.71)	(1.35)	(2.61)	(7.31)
HH size	-1.280*	0.847	-0.864	19.667**
	(0.68)	(1.35)	(2.54)	(8.47)
Occupation	-0.043	0.609*	1.916***	3.227
	(0.17)	(0.35)	(0.68)	(2.16)
Income	5.547***	6.291	17.488**	66.716**
	(2.11)	(4.22)	(8.28)	(27.04)
Financial wealth	0.855***	1.732***	2.506***	4.379*
	(0.27)	(0.48)	(0.86)	(2.62)
Real wealth	2.907	-18.707***	-19.689	-188.845***
	(3.24)	(6.10)	(12.07)	(44.97)
Financial expectation	0.665	0.679	6.078**	8.915
	(0.73)	(1.35)	(3.06)	(8.59)
Adverse shocks	-0.686*	-1.092	-0.449	3.676
	(0.36)	(0.70)	(1.30)	(3.88)
Income fluctuation *(t-1)*	0.272	-0.057	-0.910	0.448
	(0.32)	(0.64)	(1.18)	(3.68)
Risk preference	-0.123	-2.048**	-1.938	-0.321
	(0.45)	(0.92)	(1.82)	(5.53)
Constant	-7.177**	10.053	8.253	125.224**
	(3.32)	(6.65)	(13.27)	(48.75)
Observation	3288	3288	3288	3288

Notes:

1. Results are from decomposition analyses that compare the distribution of amount of outstanding debt to asset ratio of rural households in Vietnam to those in Thailand using coefficients from pooled RIF-regression models.
2. Results are based on the RIF-Regression decomposition method.
3. Numbers in brackets represent standard errors.
4. *, **, & *** represent statistical significance at the 10%, 5%, & 1% level respectively.