

# *Migration and Remittances in Emerging Market Economies of Southeast Asia: Do they Offer Paths for Structural Poverty Transitions?*

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## **1. Introduction**

The movement of rural people out of agriculture in order to find jobs in urban centers is a major ingredient of the development process especially in developing countries. Emerging market economies like Thailand and Vietnam are a particularly good example not only because of their long history of rural–urban migration, high rates of economic growth, and good records of poverty reduction, but also because of their experience with economic and political shocks and a still large share of the population living in rural areas. Remittances sent by migrants comprise a large and growing share in rural incomes. Recently, the share of remittances to total income sent by migrants is significant and growing in many developing countries. For example, Nguyen *et al.* (2007) indicated that rural households in Vietnam earn more than 25% of their income from remittances. Further, evidence showed that migration, particularly remittances can relax liquidity constraint and allow poor households to engage in high return activities, in turn, improve asset accumulation over time and a higher standard of living (e.g., Taylor and Fletcher, 2007; Adams and Cuecuecha, 2010; Taylor *et al.*, 2003).

In contrast to these reflections and findings, other research indicates that while the poor tend to migrate in order to diversify agricultural income risk as well as because of lack of investment capital for agriculture, they face entry barriers to engage in better employment opportunities in urban areas (Mckenzie and Rapoport, 2007; Amare *et al.*, 2012; Nguyen *et al.*, 2007). As a result, migrants from poor households tend to engage in low-return activities like factories and sweatshops in urban areas, while the better households tend to have more successful migrants; with the result migration ultimately has a tendency to increase inequality in the community of origin (Acosta *et al.*, 2008; Amare *et al.*, 2012). The overall impact of migration on economic poverty and inequality at origin remain empirical questions.

Several studies in various developing countries focused on the impact of migration and remittances on poverty and inequality based on recall of flow variables such as income and consumption (e.g., Amare *et al.*, 2012; Adams and Cuecuech, 2010; Nguyen *et al.*, 2011; de Brauw and Harigaya, 2007; Acosta *et al.*, 2008). However, a limitation of such variables is that they do not distinguish whether migration and remittances increased the returns and thereby allow a structural poverty transition out of poverty due to asset growth, or only lead to stochastic transition due to

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higher income, with a high probability of falling back into poverty soon (Carter and Barrett, 2006; Carter and May, 2001). Besides, measurement errors because of income and consumption data variability can lead to overstatement of income and consumption poverty transitions, which can inadvertently lead to overestimation of poverty transition impact of migration and remittances (Sahan and Stifel, 2000; Barrett, 2005; Barrett *et al.*, 2006).

This paper uses a three-year rural longitudinal data set that contains information at village and household level of some 4400 households in 440 villages in six provinces in Vietnam and Thailand to determine the extent to which engaging in migration and remittances affect long term asset growth. Specifically, we test whether migration and remittances facilitates poor rural households to climb out of poverty and catch-up to their better-off neighbors in the community of origin. This paper contributes to the literature in three ways. First, to the best of our knowledge, empirical evidences explicitly linking migration, remittances and the new economics of labor migration, to welfare dynamics using the asset-based approach to poverty are very few and our study positions itself in this respect to fill the research gap.

Second, our study provides evidence additionally to existing literature in investigating whether migration and remittances enable poor households to catch-up with wealthier neighbors by estimating the impact of migration and remittances on asset growth by splitting the sample into structurally poor and non-poor. The context of rural Vietnam and Thailand are particularly suitable for this endeavor, given that both countries, although to different degrees, show a growing regional inequality (World Bank, 2007). Therefore identification of a robust relationship between migration, remittances, and welfare dynamics could have long term policy implications. Third, the paper provides evidences on the asset growth impact of adverse shocks and geographic capital regarding both, institutions and topography.

The remainder of the paper is organized as follows. The next section describes the conceptual framework and summarizes existing empirical evidences pertain the impact of migration and remittances on rural poverty. In section 3 the paper elaborates the data setting and specification of the methodology to test our hypotheses. In section 4 welfare dynamic transitions are presented followed by the discussion on econometric analysis in section 5. Finally, in the last section, conclusions and policy implications are drawn.

## **2. Conceptual Framework**

In this section the paper outlines the conceptual framework that links migration and remittances, and asset poverty dynamics. The paper links the asset-based approach with the new economics of labor migration to explain some of the most important channels through which migration and remittances can potentially influence welfare dynamics of rural households. Our asset poverty dynamics model is

building on that of Barrett *et al.* (2006) and Barrett (2005). We express income of the household as the product of households' productive asset endowments and the returns to capital:

$$Y_{it} = K'_{it}[r_{it} + \mu_{it}] + \lambda_{it} + \varepsilon_{it} \quad (1)$$

where  $Y$  is measured income of household  $i$  in time  $t$ , where  $K_{it}$  refers to a vector of human and physical capital and  $r$  is the corresponding vector of expected returns per unit asset held.  $\mu$  refers to an exogenous shocks like production or market shocks, and  $\lambda$  represents transitory unearned income.  $\varepsilon$  represents the measurement error. We assume that exogenous shocks, transitory unearned income and measurement error ( $\mu_{it}$ ,  $\lambda_{it}$  and  $\varepsilon_{it}$ , respectively) have a mean of zero, constant variance, and are serially independent. Period specific income, what Carter and Barrett (2006) refer to as “structural income” is specified as follows:

$$E[Y_{it}] = K'_{it}(r_{it}) \quad (2)$$

Total differentiation of the income equation (2) yields an expression for income change as a function of change in asset stocks, change in expected returns on assets, and various sources of shocks:

$$dY_{it} = dK'_{it}[r_{it} + \mu_{it}] + K'_{it}[(dr_{it} + d\mu_{it})] + d\lambda_{it} + d\varepsilon_{it} \quad (3)$$

Taking the expectation of equation (3) determines the structural income growth of the household:

$$E[dY_{it}] = dK'_{it}r_{it} + K'_{it}dr_{it} \quad (4)$$

Equation (4) highlights that structural income growth depends on changes in productive asset holdings and on changes in rates of return on assets. Farm households in developing countries face market constraints and entry barriers when attempting to invest in high-return activities which yield marginal and average returns higher than the ones in which they are currently engaged (Bezu *et al.*, 2012).

The new economics of labor migration states that remittances ( $I$ ) can improve the asset accumulation and offer rural households pathways for structural transitions by enabling them to overcome liquidity and risk constraints (Stark, 1991; Taylor and Lopez-Feldman, 2010). In other words, it is argued that remittances are a transitory type of income that households tend to spend more on investment (including human and physical capital investments) than on consumption goods, and this could raise the productivity of households fixed assets. For example, Yang (2008) in the Philippines and Adams and Cuecuecha (2010) in Mexico find that households receiving remittances spend more on capital investment goods like education and in small scale businesses. Thus, the first channel by which remittances can affect asset growth is by stimulating productivity increasing returns of the household's assets, land and labor (through change in returns to the capital owned,  $dr_{it}$ ) by enabling liquidity constrained household to take the advantage of previously inaccessible opportunities. The returns to capital owned can be specified as follows:

$$r_{it} = f(I, K_{it}, G_{vt}, \lambda_{it}, \mu_{it}, \varepsilon_{it}) \quad (5)$$

The inclusion of  $K_{it}$  in the return function allows for variable returns to scale and  $G_{vt}$  refers to a vector of exogenous variables such as geographic capital like infrastructure facilities, topography, and social security status of the village that may lead to different rates of returns across time or place for the same level of capital and remittances.

The second possible channel by which remittances can improve standard of living of the rural households is through changes in asset stocks such as productive assets, education and health expenditures. Thus, income growth can be expressed as a reduced form function of initial human and physical capital, remittances income ( $I$ ) and changes in the capital and remittances income as well as the initial exogenous conditions and changes in these conditions:

$$dY_{it} = f(K_{it}, dK_{it}, I_{it}, dI_{it}, G_{vt}, dG_{vt}, \lambda_{it}, d\lambda_{it}, \mu_{it}, d\mu_{it}, \varepsilon_{it}, d\varepsilon_{it}) \quad (6)$$

However, there is considerable evidence that suggests receiving remittances can cause behavioral changes at the household level and that households tend to spend remittances on consumption rather than investment (Adams and Cuecuecha, 2010). For example, Rozelle *et al.* (1999) finds that in China agricultural productivity fell as a result of migration because of imperfect labor markets. Evidence by de Brauw and Rozelle (2008) finds that migration plays an important role in increasing consumption in poorer rural areas, but they find no evidence of a link between migration and productive investment in China. Similar evidence is provided by Damon (2010), who indicates that migration and remittances do not affect agricultural input use and decrease the returns to land and labor on farm in El Salvador.

Similarly, because of the costs and risks associated with migration, particularly high-return migration, the better-off households are more capable to migrate (Mckenzie and Rapoport, 2007; Admas, 2007). Furthermore, evidences showed that certain migration streams mainly depend on the level of human and physical startup capital. As a result, poor households tend to engage in low-return activities while relatively better rural households make better migrants and benefit more from migration which leads to sharpening inequality as well as changes in the nature of inequality in the community of origin (Mckenzie and Rapoport, 2007; Amare *et al.*, 2012; Admas, 2011). Besides, migration could also affect the age structure of a household with younger and older people left behind, and in an economy without complete markets like imperfect substitutability of hired labor, decline in production and productivity can result (Taylor and Lopez-Feldman, 2007).

Taking a clue from the above line of reasoning, in this paper we hypothesizes that remittances may lead to greater asset growth for initially wealthy or better-off households,  $dY_{it} / dI_{it} > 0$ , while initially poor rural households tend to produce poor migrants. Thus migration can lead to a reduction in family labor and rise in available capital for production, whereby migration can result in a lower asset growth and may increase inequality,  $dY_{it} / dI_{it} < 0$ .

### 3. Study Setting and Data descriptive

The data used for this study originates from a longitudinal survey to assess vulnerability to poverty in Asia (DFG FOR 756 database) that comprises three rounds (2007- 2008- 2010) of household and village level surveys. The survey was conducted in three provinces from the North Central Coast and Central Highlands in Vietnam and three provinces in Northeast Thailand. The provinces were deliberately selected for their peripheral location along a border to their common neighbor Laos or Cambodia and a certain degree of variation of agro-ecological conditions.

A three-stage cluster random sampling procedure was used to obtain a sample representative of the rural population of the three purposively selected provinces. In the first stage, sub-districts were selected with a probability proportional to size by a systematic sample from a list ordered by population density, which ensures proportional coverage of densely and less densely populated areas. Next, two villages were chosen and sampled from each selected sub-district with a probability proportional to size. Finally, within each village, 10 households were randomly selected. The final sample includes 440 villages and a total of 4400 households which is a representative sample of rural households in the surveyed provinces of Northeastern Thailand and North Central Coast and Central Highlands of Vietnam (see Hardeweg *et al.*, 2012 for more detail on the sampling procedure).

Across all three rounds (2007-2008-2010), 2108 and 2095 households appear in all rounds in Vietnam and Thailand, respectively; yielding a low attrition rate of about 1.1% and 1.2% per year in Vietnam and Thailand, respectively. The survey instrument includes modules on household characteristics, assets, income, and consumption. A comprehensive shock section to collect retrospective information about shock experience is included as well. The village head questionnaire contains information about the infrastructure and basic public goods that could affect the livelihoods of the households and the decision of the households to cope with shocks and risks. As the main focus of the study is to explore the impact of migration remittances in explaining asset accumulation over time, we considered both kind and cash remittances from both internal and international to migrant households measured by the survey. We defined a migrant rural household is a household that had at least one migrant in a given year.

Table 1 provides definitions and summary statistics of the pooled sample characteristics of the panel variables used in the regression. Household monthly income per capita was 119 USD and 171 USD for Vietnam and Thailand. Close to three-fourth of the sampled households were male headed in both countries. On average, the household size for Vietnam was 4.38 and 4.04 for Vietnam and Thailand, respectively. Average years of schooling of adult members were 7.86 in Vietnam and 6.15 in Thailand. More than 85% of the households were participated in political or social organization in Vietnam and only 15% of the households in political or social organization in Thailand. More than 75% of the sampled households in both countries participated in non-farm activities. Both countries are affected by climate related, economic and political shocks, the income loses because of various

sources of shocks averaged about 45% and 38% of annual household income for Vietnam and Thailand.

The average monthly income per capita, share of income from remittance and proportion of migrant households for the three years are reported in Table 2. Income per capita increased from 101 USD in 2007 to 133 USD in 2010 for Vietnam, 170 USD in 2007 to 211 USD in 2010 for Thailand, giving an annualized growth rate of 8% and 6% for Vietnam and Thailand, respectively. About 38% and 45% of the sampled households are migrant households in Vietnam and Thailand in survey periods, respectively. The higher proportion of migrant households likely reflects long history of rural–urban migration in these two countries. The average number of migrant per migrant household was 3.12 in Vietnam and 4.32 in Thailand. The average annual income from remittances was 453 USD in Vietnam and 1086 USD in Thailand.

## 4. Empirical Framework

### 4.1. Constructing asset index and welfare transition dynamics

To address our research objectives, we first aggregate an asset index using a version of the Adato *et al.* (2006) livelihood regression model. The livelihood-based asset index is derived from a bundle of assets that are likely to shape a household's future well-being. Compared to welfare dynamics measured using flow variables such as income and consumption expenditure which mainly identified stochastic transition, assets index scaled in Poverty Line Units (PLUs) can be interpreted as measuring the underlying structural poverty line (Carter and May, 2001). The asset index is constructed through a livelihood regression:

$$L_{it} = \alpha + \sum_{j=1}^J \beta_j(A_{ijt}) + \sum_{j,k} \beta_{jk}(A_{ijt})(A_{ikt}) + \beta_h H_{it} + \beta_g G_{vt} + \beta_\lambda \lambda_{pt} + \varepsilon_{it} \quad (7)$$

where livelihood  $L$  defined as household  $i$  income per capita per month divided by the nationally defined poverty line<sup>2</sup>,  $P$ , in period  $t$ .  $L_i$  below one indicates households with an income below the poverty line and  $L_i$  above one identifies non-poor households.  $A_{ijt}$  is amount of asset  $j$  household  $i$  owns in time  $t$  and  $H$  household characteristics.  $\beta$  are vectors of the coefficient of the current asset owned by household and household characteristics.  $G_{vt}$  refers to a vector of exogenous variables at village ( $v$ ) level. Province-by-time dummies ( $\lambda_{pt}$ ) were added to control for unobserved village characteristics, such as land quality, that could affect the return to assets.

Similar to previous studies (e.g., Radeny *et al.*, 2012; Adato *et al.*, 2006), the choice of explanatory variables used in this model was guided by the sustainable livelihood framework which

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<sup>2</sup>We use official poverty data, the poverty line is set at 1.76 USD PPP per day in rural Vietnam (GSO, 2011) and 2.53 USD PPP per day in Thailand (NSO, 2008).

addresses different types of assets upon which individuals draw to build their livelihoods. These are human, natural, physical, social and geographic capital. Human capital was measured through maximum years of education of a household member, proportion of adult members and proportion of dependents (under 15-years old and over the age of 65). Social capital was proxied through memberships in local social and political organization. We included various proxies for physical and natural capital based on the estimated value<sup>3</sup> of agricultural tools, transportation tools, land in hectare and other assets that are likely to enhance the productivity of other endowments, such as value of own house and value of house utilities. The squared term of several variables and interaction effects between all basic assets was included in order to account for potential diminishing returns on assets and lifecycle effects, and allows the marginal returns of assets to vary with the level of other assets. The data used in the estimations also includes geographic capital. Table 1 provides definitions of the variables and summary statistics of the variables used in the regression.

We subsequently distinguish welfare transitions into stochastic and structural poverty based on realized level of wellbeing ( $A_{it}$ ) estimated using the asset index in equation (7). A household is *stochastically poor* if it has assets worth at least the nationally defined poverty line ( $P_t$ ), yet its income falls below  $P_t$ . Equally, a household is *structurally poor* if its asset holdings are less than  $P_t$ , as well as its income falls below  $P_t$ . We further defined three stochastic transition classes: *stochastically poor*, *stochastically upward mobile*, and *stochastically downward mobile*. The *stochastically poor* are households that are observed to be below the monetary poverty line based on their income in both periods, but whose asset levels are expected to be above the poverty line in both periods. The *stochastically upward mobile* are households that have moved from below to above the poverty line, but still lack the assets to generate sufficient income to be non-poor. The *stochastically downward mobile* are households that have moved from above to below the poverty line, but have the assets to generate sufficient income to be non-poor in both periods.

In addition, we also defined structural transition classes for transitions that are not accounted for by stochastic factors: *structurally poor*, *structurally upward mobile*, *structurally downward mobile* and *structurally non-poor*. The asset poverty line is thus estimated and defined with reference to the income poverty line, but emphasizes the structural factors that drive income rather than the stochastic events that affect them.

#### 4.2. Asset growth equation

Following our conceptual framework in section 3 and using the data set described above, we examine how migration and remittances, initial asset positions, asset and income shocks experienced by

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<sup>3</sup> To make comparison across time possible, monetary values are measured in USD purchasing power parity (PPP) adjusted at 2005 prices.

households, household characteristics, and geographic capital explain a household's accumulation path between baseline (2007) and 2010. Our empirical models are specified in equation (8). Specifically, first we compare asset growth between non-migrant and migrant households in the community of origin as specified in equation (8a). Second, we investigate the role of number of migrants and remittances in explaining rural households' asset accumulation path over time as in equation (8b). Third, we estimate both equations (8a) and (8b) to test whether migration and remittances impact the structurally poor households differently than structurally non-poor ones.

Analyzing the poverty implications of migration and remittances poses at least two challenges: unobserved heterogeneity and possible endogeneity which could lead to inconsistent estimates of the gains of migration and remittances. To account for endogeneity of the migration due to unobserved characteristics, we use the structural component of income as outcome variable. It is estimated based on sustainable livelihood regression model from a bundle of assets that are likely to shape a household's future well-being using a household fixed effect model which controls measurement error, household and village level unobserved characteristics. Second, we include pre-determined initial levels of migration and remittances which can be considered exogenous. Third, in addition to initial household characteristic, we use initial village-level geographic capital to control for unobserved household community characteristics which can also explain migration and remittances in our regressions. Thus, the asset growth regression equation is illustrated by the following model:

$$\Delta A_{it} = \beta_1 M_{it-1} + \beta_2 A_{it-1} + \beta_3 Z_{it-1} + \beta_4 \mu_{it} + \beta_5 X_{vt-1} + \varepsilon_i \quad (8a)$$

$$\Delta A_{it} = \alpha_1 I_{it-1} + \alpha_2 A_{it-1} + \alpha_3 Z_{it-1} + \alpha_4 \mu_{it} + \alpha_5 X_{vt-1} + \mu_i \quad (8b)$$

where  $\Delta A_{it}$  refers to growth in asset between  $M_{it-1}$  and  $I_{it-1}$  refer to pre-determined initial migration and initial levels of log of remittances. The household's initial asset level  $A_{it-1}$  is included in the growth regression to capture the idea of the conditional convergence hypothesis that initially poorer households grow more rapidly because marginal returns to assets are diminishing globally over the whole asset distribution and eventually gravitate to the same long term equilibrium (Carter and Barrett, 2006).  $Z_{it-1}$  is a vector of initial levels of household characteristics. To explore the impact of shocks ( $\mu_{it}$ ) on asset growth, we include information on severity<sup>4</sup> of shocks recorded by each household, and income and asset consequences of shocks. Severities of shocks are measured as share of asset and income loss to total asset and income. Similarly, to address the impact of geographic capital in explaining asset accumulation over time, we include village level ( $v$ ) geographic capital ( $X_{vt-1}$ ) (see table 1 for definitions of the variables). We estimated our growth model using household-

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<sup>4</sup>The questions asked during the survey are: (1) when considering the time during a year preceding the survey, has there been any event causing a shock affecting the household and, (2) severity of the shocks, (3) subsequent welfare loss due to shocks.



level random effects models which assume that the latent individual effect is a time-invariant random variable, distributed independently across individuals.

## **5. Results and Discussions**

### **5.1. Structural income, welfare dynamics transitions and migration**

We derive structural income and distinguish between structural poor and non-poor based on realized level of wellbeing ( $A_{it}$ ) estimated using sustainable livelihood regression model as specified in equation (7) using fixed effects model. The fixed effects model<sup>5</sup>, using rich set of asset covariates, explains 22% and 25% of the (within) variation of the livelihood measure in Vietnam and Thailand, respectively. A fixed effects model is preferred because our test indicated that endogeneity problems due to unobserved characteristics invalidating the random effect model in favor of the fixed effects model. Fixed effects model yield consistent in the presence of unobserved time invariant characteristics.

The average monthly structural income and structural poverty for three years are reported in Table 3. Structurally poor are households that are observed to be below the monetary poverty line based on their income and asset levels in both periods. Structural income increased from 107 USD in 2007 to 130 USD in 2010 for Vietnam, and from 145 USD to 207 USD for Thailand, giving analyzed growth rate of 5% for Vietnam and 11% for Thailand. Structural income growth is reflected on the change in the structural poverty for Vietnam. For example, the results show that a significant decline in structural poverty (decreased by 9%). Structural income growth is higher in Thailand (13% annually), but there was no significant change in structural poverty between 2007 and 2010. This may suggest that the results of the structural income growth do not trickle down to rural households at lower-income levels.

We also distinguish welfare transitions into stochastic and structural poverty over the period 2007-2010 based structural income. As can be seen in Table 4, about 17% and 13% of households in Vientiane and Thailand escaped from poverty during 2007-2010, respectively, while the majority of households in Vietnam that escaped poverty over the period 2007–2010 experienced stochastic movements, with only 35% escaping poverty through asset accumulation, suggesting that the upward mobility of Vietnams rural households largely attributed to stochastic reasons rather than successful asset accumulation. Of the Thai and Vietnams households sliding into poverty 64% and close to half experienced stochastic transitions, whereas 46% and 50% were structurally poor. Looking at twice

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<sup>5</sup>Because in this paper we are primarily interested in the predicted value of the estimation (structural income) that reliably predict the effect of an asset bundle on expected scale income per capita, we only focus on robustness of our prediction. The fixed effect model regression results are not included here. The results are available on request from the author.

poor households, we find that 56% in Vietnam and 55% in Thailand were stochastically poor, while about 44% and 45% of the twice poor were structurally poor. The overall welfare transition results reveal that substantial upward mobility among the different classes of well-being, but small proportion of the households are escaping from poverty through asset accumulation in Vietnam. Though the upward mobility was lower compared to structural income growth, the results show that large proportions of the households in Thailand are escaping from poverty through asset accumulation.

The results in Table 5 show that a significant increment in structural income in both countries. Annual growth rate was 7% and 5% over the period 2007–2010 for migrant non-migrant households, respectively in Vietnam. Similarly, the results show that a significant decline in structural poverty for both migrant and non-migrant households. Poverty decreased by 10% and 9% in 2010 for migrant and non-migrant households. In Thailand, structural income growth was 7 % and 13% for migrants and non-migrants, and poverty decreased by 5% and 8% in 2010 for migrant and non-migrant households. In sum, the results show that poverty has significantly reduced between 2007 and 2010. The results also suggest that migration may contribute to poverty reduction, although a proper multivariate analysis is needed to establish causality.

Table 6 presents summary statistics of households in our sample by migration status in both Vietnam and Thailand. Migrant households are measurably richer than the average household in Vietnam; migrant households have higher structural income levels than do non-migrants and difference is statistically significant, however, in Thailand migrant households are poorer than non-migrant households. Migrant households in both Vietnam and Thailand tend to be well-educated, have significantly greater labor endowments, and a lower dependency ratio compared to non-migrant households. For example, adults in Vietnamese and Thais migrant households have on average 8.81 and 6.45 years of schooling; while non-migrant households have an average of 7.27 and 5.90. Vietnamese migrant households are more often from ethnic majority and also more often involved in political or social organizations. Furthermore, Vietnamese migrant households are from villages with better geographic capital like paved roads, electricity, sanitation and market access; experienced less violence and epidemics, and plain areas. Migrant households in Thailand are more likely to report asset loss due to various sources of shocks and are from village with less off-farm opportunities.

## 5.2. *Asset growth impact of migration and remittances*

In the previous section, we provided a general overview of structural transition classes based on asset index values calculated from regression equation (7), correlates of structural poverty transitions, and summary statistics of migrant and non-migrant households. Asset growth (Equation 8) is estimated using a random effects panel model. The Hausman test could not reject the individual specific effects to be uncorrelated with the other regressors. Thus, a random effects model allows more efficient

estimation and permits inference with respect to key time-invariant variables such as ethnicity and geographic capital.

First, we present the results from the impact of migration on asset growth in Vietnam. As shown in Table 7, Vietnamese migrant households did not grow faster than non-migrant households, suggesting that migration without return has no effect on asset accumulation overtime<sup>6</sup>. Second, we regress the asset growth on remittances, number of migrants and other controls. The estimation results are reported in Table 8 and 9 for impact of remittances and number of migrants, respectively. The analysis reveals that remittances and number of migrants have significant impact in explaining asset accumulation overtime. Controlling for other factors, for Vietnamese households, 10% increase in remittances increases asset growth by 0.24%, on average. This supports the hypothesis that remittances facilitate asset accumulation over time by enabling households to overcome liquidity constraints and therefore stimulating productivity enhancing investments in agriculture and investments in small scale enterprises. This is in line with the finding of Adams and Cuecuecha (2010) in Guatemala and McCarthy *et al.* (2009) in Albania, who find that migrant households tend to spend remittances on investment including human and physical capital investments.

To address whether migration and remittances have more impact on asset growth of structurally poor households than of structurally non-poor ones, we estimate and compare the preceding growth model (Equation 8) by welfare status<sup>7</sup>. The results are reported in Table 8. We find that structurally poor households have a positive significant asset growth elasticity of remittances, while structurally non-poor households have no significant asset growth of remittances. This supports the new economics of labor migration hypothesis that remittances improve the asset accumulation and offer rural households pathways for structural transitions and catch-up to their better-off neighbors by enabling poor households to overcome liquidity constraint to engage higher return activities (Taylor and Lopez-Feldman, 2010).

To test the idea of the conditional convergence hypothesis that initially poorer households grow more rapidly because marginal returns to assets are diminishing globally over the whole asset distribution, we estimate the relationship between initial asset position and asset growth. The results

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<sup>6</sup>Alternative specification is applied to check the robustness of our results. We regress asset growth on migrant households with and without remittances. We find consistent results. The analyses reveal that migration without remittances have no significant impact on asset growth in Vietnam, while migration with remittances has a positive impact in explaining welfare dynamics. For Thailand, migration with and without remittances have negative impact on asset accumulation over time. The results can be obtained from the lead author by requests.

<sup>7</sup>Structurally poor households are defined as households who have structural income, predicted based on the livelihood regression model (Equation 7), below asset poverty line, as well as its income falls below the income poverty line.

show interesting two patterns. First, the aggregated data seems to support the convergence hypothesis. When we conduct the growth model analysis separately for structurally poor and structurally non-poor households, interestingly, the results show that households' initial asset level is strongly significant and negative both for poor and rich households. However, initially structurally poor households have much lower asset growth elasticity than do the structurally non-poor. Compared to structurally poor households, the coefficient of initial asset is 35% higher than for structurally non-poor households (see Table 8). As a result, structurally poor households tend to grow at a lower rate than wealthier households. This is consistent with the poverty traps hypothesis; the income generating process indicates increasing returns to scale which can result in excluding households with low initial conditions from accessing more remunerative income activities (Carter and Barrett, 2006). The finding is consistent with structural poverty transitions results presented in Table 4. Structurally poor households have lower achievement of adult of education, are less likely to engage in small and medium scale enterprises, around 55% of them are from ethnic minorities. In addition, they are living in the village with limited access to quality road, irrigation, off-farm opportunities, sanitation, public water supply and electricity.

Turning to the household characteristics, household size, gender of the head, ethnicity and membership also have statistically significant effects on asset growth. Households with large family size experience lower growth. Male headed households grow more than female headed households. In line with expectations, we find households in which the head is from an ethnic minority have significantly lower asset growth rates. The result show that the asset growth between rural ethnic majority headed households and the ethnic minorities increased by 18%. Memberships in local social and political associations have a strong significant and positive effect on asset growth.

Looking at geographic capital, we find local availability of geographic variables such as roads; public water and access to irrigation play a significant role in improving asset growth. These indicate that asset growth rates at the household level are significantly higher in generally accessible areas. The effect of quality of roads is particularly strong, the asset growth between households in villages with a paved road and households in villages with a dirt road increased by 10 %. Living in a mountainous area lowers the long-run rate of asset growth. Natural conditions for agriculture tend to be better in the plains than mountains. Both geographic variables measuring the social security of the village such as the existence of violence and epidemics have a strong and significant negative impact on individual asset growth rates. Our result also suggests that households in villages with good market access and favourable agro ecological endowments are more likely to accumulate assets at household level. This is in line with findings of Jalan and Ravallion (2002), who found evidence of geographic poverty traps in China.

Furthermore, we examine the impact of shocks in explaining asset accumulation over time. Consistent with previous empirical evidences, asset growth decreases with an increase in severity of

the effect of a shock on assets both for structurally poor and structurally non-poor household. However, the impact of shocks is higher for structurally poor households indicating that poor households are deeply affected by asset shocks. This suggests that asset shocks can have permanent effects on already vulnerable households which resulting in poverty traps. The results show that a 10% asset loss would be expected to reduce growth for non-poor households by about 5 %, while 19 % for poor households. These asymmetric effects suggest that shocks offset the tendency toward convergence and generate nonlinear dynamics associated with persistent poverty. Our results are consistent with the findings of Carter *et al.* (2007), who found shocks and loss of assets pushed a number of previously non-poor households into severe and long-term poverty.

For Thailand as in Vietnam, households' initial asset level is strongly significant and with negative relationship to asset growth for both structurally poor and structurally non-poor households (Table 8). However, initially structurally poor households have much lower asset growth elasticity than do non-poor households. Compared to structurally poor households, the coefficient of initial assets is 35% higher than for structurally non-poor households. Consequently, wealthier households tend to grow at a higher rate than poorer households, which supports the existence of a poverty trap (Carter and Barrett, 2006).

Unlike in Vietnam, in Thailand the estimation results (Table 7) show that migration reduces asset growth. We also test whether migration impacts the poorer households differently than non-poor households by estimating the growth model separately for structurally poor and structurally non-poor households (Table 8). The result indicates that migration has a negative impact on asset growth for structurally poor households; while migration has no significant impact on asset growth for structurally non-poor households.

In addition, we also estimate the impact of remittances and number of migrants on asset growth in Thailand. The estimation results (Table 8 and 9) show that remittances and number of migrants decrease asset accumulation for initially structurally poor households, such that remittances offset the tendency of poor households to climb out of poverty and catch-up to their better-off neighbors. There are a few possible explanations for this result. A first explanation for the negative relationship between remittances and asset growth, though poor households are more likely to migrate and receive remittances, girls and young women migrants from poor households tend to engage in domestic service jobs and garment factories, and boys and men engaging in unskilled construction jobs, while better off households are able to educate their children through secondary school or higher, and their migrants able to engage in high-return activities in urban areas and enjoy higher income growth (Amare *et al.*, 2012).

A second explanation for this negative relationship between migration, remittances and asset growth is that remittances may increase the reservation wage at which members of migrants households are willing to engage in self-employment and off-farm activities (Kim, 2007; Adams and

Cuecuecha, 2010). Third, rapid and continuing out-migration of younger household members in Thailand may increase labor constraints in agricultural production and raises new problems for the demographic and social structure of remote rural areas, as mainly the grandparents in the village who take care of the grandchildren which push the youth who receive remittances hooked with alcohols and drugs because of lack the educational guidance from their parents (Hardeweg *et al.*, 2010). A fourth explanation for the negative impact of migration and remittances on asset growth in Thailand is that households receiving remittances are structurally poor and downward mobile households (see Table 5) and thus they spend more at margin on consumption of basic goods like food rather than investment goods (Adams and Cuecuecha, 2010; de Brauw and Rozelle, 2008).

As in Vietnam, in Thailand household size, gender of the household head and membership has statistically significant effects on asset growth (Table 8). Households with large family size experience lower growth. Female headed households tend to grow higher than male headed households. We also find that households who have social capital through participation in local social and political organization increase their assets by 8%. Turning to the impacts of shocks in explaining asset accumulation path, consistent with previous empirical evidences, we find asset growth decreases with an increase in severity of asset and income shocks. However, the impact of shocks is not significant for structurally poor households.

## **6. Conclusions and Policy Implications**

This paper has examined the link between migration and remittances, and welfare dynamics in emerging economies of Southeast Asia using longitudinal data collected from households in six particularly vulnerable provinces of Thailand and Vietnam. First, in this paper we identify who are structurally poor by decomposing welfare transition over time. Second, we investigate to what extent migration and remittances improve asset accumulation in the source communities. Third, the paper explores whether remittances facilitate structural poverty transitions of the poor and catch-up to their better-off neighbors. It also investigates the impact of shocks and geographic capital in explaining asset growth. Our results are based on asset-based approach to poverty which provides richer understanding of the long term poverty impact of migration and migration remittances.

Analysis of the Vietnams data reveals that substantial upward mobility among the different classes of well-being, but small proportion of the households are escaping from poverty through asset accumulation. Household characteristics (ethnicity, membership), shocks, and geographic capital are playing a significant role in explaining structural poverty transitions. Most of structurally poor and downward mobile households are from ethnic minorities, experienced sever shocks and come from villages characterized by remoteness, less quality roads, mountainous environments, limited public service facilities, and more violence and epidemics. These groups are also less likely to migrate and receive remittances.

In an effort to test signal the presence of a poverty trap, and determine to what extent migration and remittances facilitates asset accumulation over time and pro-poor, we estimate migration and remittances impact on asset growth by splitting the sample into structurally poor and structurally non-poor. We find structurally poor households tend to grow at a lower rate than structurally non-poor ones. The result supports the finding of a poverty trap which underlying income generating process reveal increasing returns to scale (Carter and Barrett, 2006).

Structurally poor migrant households with remittances experience higher growth in asset, such that remittances facilitates poor households climb out of poverty and catch-up to their better-off neighbors. This is in line with previous studies (e.g., Taylor and Fletcher, 2007; McCarthy *et al.*, 2009; Adams and Cuecuecha, 2010). Similar to previous studies (e.g., Carter *et al.*, 2007; Hoddinott, 2006; Quisumbing and Baulch, 2009), the paper identifies that shocks, limited accessibility of infrastructure facilities and ethnicity offset the tendency toward convergence. This implies the need for policy to strengthen integrated formal and informal insurance schemes or risk-reducing mechanisms, and building up rural institutions to promote the use of remittances by overcoming underinvestment in particular geographic areas.

Unlike in Vietnam, in Thailand the welfare transition results show that large proportions of the households are escaping from poverty through asset accumulation. Household characteristics (dependency ratio membership), and some geographic capital are playing a significant role in explaining structural poverty transitions. Structurally poor and downward mobile households are more likely to migrate and receive remittances. In Thailand-as in Vietnam structurally poor households tend to grow at a lower rate than structurally non-poor ones, which signal the presence of a poverty trap pattern.

In an effort to explore the overall impact of migration and remittances, and test whether migration and remittances facilitate poor households to escape from poverty in Thailand, unlike in Vietnam, our results reveal migration and remittances hinder rural households to accumulate assets and escape from poverty. Furthermore, we find that migration and remittances decrease asset accumulation for structurally poor households, such that remittances offset the tendency of poor households climb out of poverty and catch-up to their better-off neighbors. This is consistent with our hypothesis and previous studies (e.g., Amare *et al.*, 2012; de Brauw and Rozelle, 2005; Damon, 2010).

There are a few possible channels could explain this result. First, in an economy with imperfect substitutability of hired labor migration and continuing out-migration of younger household members like in Thailand could increase labor constraints in agricultural production and raises new problems for the demographic and social structure of remote rural areas. Second, structurally poor households are more likely to migrate and receive remittances; thereby they may spend remittances for basic consumption goods than investments goods. Third, the positive correlation between high-

return migration and households' wealth or income may provide some explanation for the negative impact of migration and remittances on asset growth in Thailand. Migrants from initially poor households are more likely to engage in low-return activities like in less visible occupations. Further research on addressing these links would be an interesting exercise.

Our results also have implications for current debates on the impact of migration and remittances on rural livelihood. Migration will affect the institutional and social conditions in the village. Migration and remittances can enable rural households to overcome liquidity constraints and to mitigate agricultural risk and shocks. However, not all migration decisions lead to the expected success for example, continuing out-migration of young households can result in a decline in production and productivity in rural areas, and bad employment in urban areas including prostitution and child labor which leads to sharpening inequality as well as changes in the nature of inequality. In this regard public policies and community development agencies could consider strengthening pro-poor development strategy in poor regions such as better and quality education, irrigational facilities, improving infrastructure and expansions of small and medium scale enterprises.



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**Table 1.** Description and Summary Statistics of Panel Variables

Variable		Vietnam (N = 6318)	Thailand (N = 6285)
<i>Household and social capital</i>			
HH size	Total household size	4.38(1.76)	4.04(1.74)
Children	Proportion of children in household less than 15	0.24(0.22)	0.20(0.17)
Elderly	Proportion of elderly in household above 60	0.10(0.23)	0.09(0.18)
Age	Age of the household head	47.40(15.64)	55.93(13.11)
Mean edu.	Average years of schooling of adult members	7.86(3.42)	6.15(2.45)
Primary	Proportion of adult completed primary school	0.26(0.24)	0.72(0.23)
High school	Proportion of adult completed high school	0.20(0.22)	0.20(0.19)
Professional	Proportion of adult completed professional education	0.55(0.27)	0.08(0.16)
Gender	Gender of the head (male headed =1, female headed =0)	0.77	0.73
Ethnic	Major ethnic Kinh & Hoa (=1), others(=0)	0.79	
Membership	Any household member involved in political or social organization (yes=1, no=0)	0.87	0.15
Off-farm	Participated in off-farm activities (yes=1, no=0)	0.52	0.54
Self emp.	Own small and medium scale enterprise (yes=1, no=0)	0.25	0.27
<i>Physical and natural capital measured in US\$ PPP at 2005 prices in hundreds</i>			
Agric. tools	Value of agricultural tools owned	4.08(10.37)	11.11(4.51)
Transp. tools	Value of transportation tools owned	10.70(29.54)	35.21(11.56)
Land	Land size owned, in hectares	0.78(1.12)	2.42(3.21)
Livestock	Value of livestock owned	8.11(25.88)	9.35(17.19)
Own house	Value of house owned	102.22(158.17)	130.51(21.58)
House utilities	Value of house utilities owned	10.08(19.66)	12.50(1.87)
<i>Geographical capital</i>			
Paved road	The village has paved road (yes=1, no=0)	0.55	0.85
Mountainous	The village is located in mountainous (yes=1, no=0)	0.48	
Main transp.	Main transportation of the village is bus or motorcycle (yes=1, no=0)	0.58	0.97
Violence	The village experienced violence (yes=1, no=0)	0.17	0.18
Epidemics	The village experienced epidemics (yes=1, no=0)	0.11	0.11
Public water supply	The proportion of households with public water supply in the village	0.23	0.89
Irrigated	Total irrigated land in the village	13.01(24.21)	5.30(5.50)
No. of enterp.	Number of enterprises who have more than 9 employees	0.17(1.64)	0.16(0.66)
HHs elect.	The proportion of households with electricity in the village	92.31(22.65)	97.35(13.01)
HHs sanit.	The proportion of households with sanitation in the village	18.20(31.53)	77.27(39.16)
Time to market	Time to reach nearest market in minute	22.57(24.37)	16.64(13.30)
Time to bank	Time to nearest bank market in minute	35.69(31.19)	22.31(13.02)
<i>Intensity of shocks</i>			
Asset loss	Share of asset loss to total asset	0.41(0.38)	0.38(0.37)
Income loss	Share of income loss to total income	0.44(0.37)	0.35(0.36)

Source: DFG Rural Village Level and Rural Household Surveys 2007, 2008 and 2010 in Vietnam. Standard deviations in parentheses.

Table 2. Average income, income from remittance and number of migrant households

<i>For Vietnam</i>				
Year	2007	2008	2010	Average
Monthly income per cap.	101(161)	125(190)	133(193)	119(182)
Migrant households	0.39	0.37	0.39	0.38
Number of migrant	3.28(2.29)	2.99(2.08)	3.1(2.15)	3.13(2.18)
Annual income from remit.	312(562)	481(629)	567(963)	453(732)
<i>For Thailand</i>				
Monthly income per cap.	170(294)	165(250)	211(253)	171(251)
Migrant households	0.45	0.44	0.47	0.45
Number of migrant	4.31(2.56)	4.35(2.65)	4.33(2.79)	4.34(2.67)
Annual income from remit.	974(460)	1006(500)	1268(762)	1086(583)

Source: DFG Rural Village Level and Rural Household Surveys 2007, 2008 and 2010 in Vietnam.  
Standard deviations in parentheses.

Table 3. Aggregate structural income and poverty by year

	2007	2008	2010	Average	(2007-10) Change t-test
<i>For Vietnam</i>					
Monthly structural income	107	120	130	119	23***
Structural poor	0.22	0.14	0.13	0.16	-0.09***
<i>For Thailand</i>					
Monthly structural income	145	151	207	168	62**
Structural poor	0.20	0.26	0.17	0.21	-0.04*

Note: \*\*\*, \*\* and \* are significant at 1%, 5% and 10 % level of significance respectively. Standard errors are given in parenthesis.

Table 4. Decomposing poverty transitions into stochastic and structural components

Vietnam					
2007			2010		
Poor			Non-poor		
Poor	<b>Twice poor</b>	<b>11%</b>	<b>Rising from poverty</b>	<b>17%</b>	
	Stochastically poor		Stochastically mobile		65%
	Structurally poor		Structurally mobile		35%
Non-poor	<b>Declining into poverty</b>	<b>6%</b>	<b>Twice non-poor</b>	<b>67%</b>	
	Stochastically mobile		Structurally non-poor		100%
	Structurally mobile				
Thailand					
Poor			Non-poor		
Poor	<b>Twice poor</b>	<b>7%</b>	<b>Rising from poverty</b>	<b>15%</b>	
	Stochastically poor		Stochastically mobile		37%
	Structurally poor		Structurally mobile		63%
Non-poor	<b>Declining into poverty</b>	<b>6%</b>	<b>Twice non-poor</b>	<b>72%</b>	
	Stochastically mobile		Structurally non-poor		100%
	Structurally mobile				

Source: Own calculations based on the DFG Rural Village Survey and Rural Household Surveys 2007, 2008 and 2010 in Vietnam and Thailand

Table 5. Structural income and poverty by migration status

	2007	2010	Change t-test	2007	2010	Change t-test
	Migrant			Non-migrant		
<i>For Vietnam</i>						
Monthly structural income	111	141	30**	104	123	19**
Structural poor	0.19	0.09	-0.10***	0.24	0.15	0.09***
<i>For Thailand</i>						
Monthly structural income	143	202	56***	145	224	76***
Structural poor	0.20	0.14	-0.06**	0.19	0.11	0.08***

Note: \*\*\*, \*\* and \* are significant at 1%, 5% and 10 % level of significance respectively. Standard errors are given in parenthesis.

Table 6. Descriptive statistics of households by migration status in Vietnam and Thailand

	Vietnam			Thailand		
	Migrant (38%)	Non-migrant (62%)	Difference Test	Migrant (45%)	Non-migrant (55%)	Difference Test
Monthly structural income	127(80)	115(84)	***	165(375)	172(133)	
HHsize	4.46(1.76)	4.33(1.76)	***	4.12 (1.77)	3.97(1.71)	***
Children	0.19(0.19)	0.28(0.22)	***	0.19(0.16)	0.21(0.18)	***
Elderly	0.07(0.17)	0.12(0.25)	***	0.07(0.13)	0.11(0.22)	***
Mean edu.	8.81(3.04)	7.27(3.51)	***	6.45(2.42)	5.90(2.45)	***
Gender	0.78	0.76	*	0.72	0.73	
Ethnic	0.86	0.75	***	-	-	
Membership	0.91	0.85	***	-	-	
<i>Geographical capital</i>						
Paved road	0.57	0.54	**	0.86	0.84	
Mountainous	0.45	0.49	***	-	-	-
Main transp.	0.56	0.59	**	0.97	0.97	
Violence	0.16	0.18	*	0.17	0.18	
Epidemics	0.09	0.13	***	0.11	0.11	
Public water supply	0.22	0.23		0.89	0.89	
Irrigated	12.51(23.45)	13.32 (24.66)	*	5.40(5.50)	5.22(5.50)	*
No. of enterp	0.18(1.67)	0.16(1.63)		0.14(0.57)	0.17(0.72)	**
HHs elect.	93.22(21.53)	91.75(23.30)	**	97.45(12.60)	97.27(13.34)	
HHs sanit.	20.07(32.93)	17.06(30.59)	***	77.33(39.34)	77.22(39.01)	
Time to market	21.87(23.48)	22.99(24.90)		17.14(13.84)	16.22(12.82)	**
Time to bank	35.28(30.30)	35.94(31.73)	*	22.58(13.07)	22.09(12.98)	
<i>Intensity of shocks</i>						
Asset loss	0.42(0.38)	0.42(0.37)		0.40(0.38)	0.35(0.38)	**
Income loss	0.42(0.37)	0.43(0.38)		0.35(0.35)	0.33(0.35)	

Note: Own calculations based on the DFG Rural Village Survey and Rural Household Surveys 2007, 2008 and 2010 in Vietnam and Thailand.

The significance tests between migrant and non-migrant households report the t-test for continues variables and Pearson chi2 test for categorical variables. \* Significance at the 10% level, \*\* Significance at the 5% level, and \*\*\* Significance at the 1% level.

Table 7. Random effects regression estimates of asset growth by welfare status: impact of migration.

Variables	<i>Vietnam</i>			<i>Thailand</i>		
	<i>All sample</i>	<i>Structural poor</i>	<i>Structural non-poor</i>	<i>All sample</i>	<i>Structural poor</i>	<i>Structural non-poor</i>
<i>Migration decision</i>						
Migrant household	0.020(0.015)	0.048(0.060)	0.007(0.014)	-0.042**(0.018)	-0.080**(0.037)	-0.028(0.018)
<i>Household characteristics</i>						
Initial asset index	-0.499*** (0.022)	-0.758*** (0.052)	-0.506*** (0.024)	-0.563*** (0.019)	-0.868*** (0.035)	-0.656*** (0.023)
Hhsize	-0.147*** (0.020)	-0.552*** (0.120)	-0.116*** (0.017)	-0.176*** (0.022)	-0.382*** (0.057)	-0.140*** (0.030)
Gender	0.038** (0.019)	0.037 (0.076)	0.037** (0.016)	-0.170*** (0.016)	-0.368*** (0.050)	-0.198*** (0.021)
Ethnic	0.180*** (0.023)	0.159** (0.076)	0.169*** (0.023)			
Membership	0.076*** (0.020)	0.112** (0.057)	0.063*** (0.022)	0.081*** (0.022)	0.161*** (0.052)	0.044* (0.025)
<i>Village characteristics</i>						
Mountainous	-0.021 (0.015)	0.044 (0.057)	-0.036** (0.014)			
Paved road	0.105*** (0.014)	0.102* (0.055)	0.114*** (0.014)	0.040** (0.020)	0.079* (0.043)	0.033 (0.033)
Violence	-0.060** (0.023)	-0.118 (0.075)	-0.039 (0.024)	-0.063*** (0.020)	-0.050 (0.041)	-0.092** (0.037)
Epidemics	-0.064*** (0.024)	-0.081 (0.068)	-0.066** (0.026)	-0.018 (0.022)	-0.032 (0.045)	-0.046 (0.039)
Public water supply	0.063*** (0.015)	0.006 (0.063)	0.080*** (0.015)	0.020 (0.020)	-0.010 (0.043)	0.036 (0.035)
Irrigated land	0.008 (0.005)	-0.011 (0.056)	0.008 (0.005)	0.044 (0.039)	0.182* (0.110)	-0.040 (0.058)
HHs electricity	0.000 (0.000)	0.000 (0.001)	-0.000 (0.001)	0.000 (0.002)	-0.004 (0.004)	0.001 (0.004)
No. of enterprises	0.001 (0.003)	0.188 (0.454)	0.001 (0.003)	0.018 (0.011)	0.041* (0.025)	-0.006 (0.020)
HHs sanitation	-0.000 (0.000)	0.004** (0.002)	-0.001*** (0.000)	0.001*** (0.000)	0.000 (0.000)	0.001*** (0.000)
Time to the market	-0.001** (0.000)	-0.001 (0.001)	-0.001*** (0.000)	-0.001 (0.001)	0.001 (0.001)	-0.002** (0.001)
<i>Severity of shocks</i>						
Asset loss	-0.077*** (0.026)	-0.197** (0.079)	-0.049*** (0.017)	-0.019*** (0.002)	-0.081 (0.127)	-0.017*** (0.002)
Income loss	-0.000 (0.000)	-0.001 (0.002)	-0.000 (0.000)	-0.003** (0.001)	-0.000 (0.001)	-0.004* (0.002)
Cons	0.339*** (0.058)	0.908*** (0.219)	0.349*** (0.060)	0.779*** (0.241)	1.669*** (0.459)	0.614 (0.402)
N	4,212	772	3,440	4,190	941	3,249

Note: Own calculations based on the DFG Rural Village and Rural Household Surveys 2007, 2008 and 2010 in Vietnam and Thailand. All time varying variables, except severity of shocks, refer to base period value. Robust standard errors in parentheses. \* Significance at the 10% level, \*\* Significance at the 5% level, and \*\*\* Significance at the 1% level.

Table 8. Random effects regression estimates of asset growth by welfare status: impact of remittances.

Variables	<i>Vietnam</i>			<i>Thailand</i>		
	<i>All sample</i>	<i>Structural poor</i>	<i>Structural non-poor</i>	<i>All sample</i>	<i>Structural poor</i>	<i>Structural non-poor</i>
<i>Remittances</i>						
Remittances	0.024*** (0.006)	0.081*** (0.031)	0.007 (0.007)	-0.013** (0.005)	-0.030** (0.014)	-0.009 (0.006)
<i>Initial assets and household characteristics</i>						
Initial asset index	-0.502*** (0.022)	-0.761*** (0.051)	-0.505*** (0.024)	-0.562*** (0.019)	-0.920*** (0.036)	-0.670*** (0.023)
Hh size	-0.152*** (0.020)	-0.557*** (0.114)	-0.117*** (0.017)	-0.179*** (0.021)	-0.421*** (0.060)	-0.132*** (0.028)
Gender	0.038** (0.019)	0.029 (0.076)	0.037** (0.016)	-0.170*** (0.016)	-0.403*** (0.071)	-0.201*** (0.021)
Ethnic	0.177*** (0.023)	0.146** (0.074)	0.168*** (0.023)			
Membership	0.077*** (0.020)	0.119** (0.057)	0.064*** (0.022)	0.080*** (0.022)	0.140** (0.064)	0.056** (0.024)
<i>Village characteristics</i>						
Mountainous	-0.018 (0.015)	0.052 (0.057)	-0.035** (0.014)			
Paved road	0.104*** (0.014)	0.095* (0.056)	0.113*** (0.014)	0.039* (0.020)	0.116** (0.048)	0.026 (0.031)
Violence	-0.058** (0.023)	-0.120 (0.075)	-0.039 (0.024)	-0.065*** (0.020)	-0.060 (0.047)	-0.093*** (0.036)
Epidemics	-0.062** (0.024)	-0.079 (0.068)	-0.065** (0.026)	-0.017 (0.022)	-0.027 (0.050)	-0.040 (0.037)
Public water supply	0.064*** (0.015)	0.012 (0.063)	0.080*** (0.015)	0.018 (0.020)	-0.056 (0.050)	0.043 (0.034)
Irrigated land	0.009* (0.005)	-0.008 (0.056)	0.008 (0.005)	0.043 (0.040)	0.151 (0.137)	-0.027 (0.057)
HHs electricity	0.000 (0.000)	0.001 (0.001)	-0.000 (0.001)	0.000 (0.002)	-0.010* (0.006)	0.003 (0.004)
No. of enterprises	0.001 (0.003)	0.219 (0.439)	0.001 (0.003)	0.018 (0.011)	0.031 (0.028)	0.001 (0.019)
HHs sanitation	-0.000 (0.000)	0.004** (0.002)	-0.001*** (0.000)	0.001*** (0.000)	0.000 (0.000)	0.001*** (0.000)
Time to the market	-0.001** (0.000)	-0.001 (0.001)	-0.001*** (0.000)	-0.001 (0.001)	0.000 (0.001)	-0.002* (0.001)
<i>Severity of shocks</i>						
Asset loss	-0.077*** (0.026)	-0.193** (0.077)	-0.049*** (0.017)	-0.019*** (0.002)	-0.046 (0.122)	-0.017*** (0.002)
Income loss	-0.000 (0.000)	-0.001 (0.002)	-0.000 (0.000)	-0.003** (0.001)	-0.001 (0.001)	-0.004* (0.002)
Cons	0.347*** (0.057)	0.922*** (0.212)	0.350*** (0.059)	0.766*** (0.239)	2.301*** (0.591)	0.484 (0.372)
N	4,212	772	3,440	4,190	941	3,249

Note: Own calculations based on the DFG Rural Village and Rural Household Surveys 2007, 2008 and 2010 in Vietnam and Thailand. All time varying variables, except severity of shocks, refer to base period value. Robust standard errors in parentheses. \* Significance at the 10% level, \*\* Significance at the 5% level, and \*\*\* Significance at the 1% level.

Table 9. Random effects regression estimates of asset growth by welfare status: impact of number of migrants

Variables	<i>Vietnam</i>			<i>Thailand</i>		
	<i>All sample</i>	<i>Structural poor</i>	<i>Structural non-poor</i>	<i>All sample</i>	<i>Structural poor</i>	<i>Structural non-poor</i>
<i>Number of migrants</i>						
Number of Migrant	0.011*** (0.003)	0.029*** (0.011)	0.004 (0.003)	-0.012*** (0.004)	-0.012* (0.007)	-0.005 (0.004)
<i>Initial assets and household characteristics</i>						
Initial asset index	-0.501*** (0.022)	-0.763*** (0.051)	-0.506*** (0.024)	-0.565*** (0.019)	-0.919*** (0.037)	-0.670*** (0.023)
Hh size	-0.158*** (0.022)	-0.595*** (0.123)	-0.120*** (0.018)	-0.156*** (0.022)	-0.405*** (0.063)	-0.123*** (0.029)
Gender	0.039** (0.019)	0.041 (0.077)	0.037* (0.016)	-0.172*** (0.016)	-0.414*** (0.072)	-0.201*** (0.020)
Ethnic	0.176*** (0.023)	0.142* (0.074)	0.167*** (0.023)			
Membership	0.076*** (0.020)	0.110* (0.058)	0.063*** (0.022)	0.080*** (0.022)	0.150** (0.063)	0.056** (0.024)
<i>Village characteristics</i>						
Mountainous	-0.019 (0.015)	0.044 (0.057)	-0.035** (0.014)			
Paved road	0.104*** (0.014)	0.106* (0.056)	0.113*** (0.014)	0.039* (0.020)	0.118** (0.049)	0.026 (0.031)
Violence	-0.059** (0.023)	-0.105 (0.076)	-0.039 (0.024)	-0.063*** (0.020)	-0.051 (0.046)	-0.092*** (0.036)
Epidemics	-0.063*** (0.024)	-0.091 (0.068)	-0.065** (0.026)	-0.015 (0.022)	-0.026 (0.050)	-0.039 (0.037)
Public water supply	0.065*** (0.015)	0.016 (0.063)	0.081*** (0.015)	0.020 (0.020)	-0.041 (0.050)	0.043 (0.034)
Irrigated land	0.008 (0.005)	-0.015 (0.057)	0.008 (0.005)	0.043 (0.040)	0.143 (0.137)	-0.027 (0.057)
HHs electricity	0.000 (0.000)	0.000 (0.001)	-0.000 (0.001)	-0.000 (0.002)	-0.011* (0.006)	0.003 (0.004)
No. of enterprises	0.001 (0.003)	0.184 (0.451)	0.001 (0.003)	0.018 (0.011)	0.031 (0.027)	0.001 (0.019)
HHs sanitation	-0.000 (0.000)	0.004** (0.002)	-0.001*** (0.000)	0.001*** (0.000)	0.000 (0.000)	0.001*** (0.000)
Time to the market	-0.001** (0.000)	-0.001 (0.001)	-0.001*** (0.000)	-0.001 (0.001)	0.000 (0.001)	-0.001* (0.001)
<i>Severity of shocks</i>						
Asset loss	-0.078*** (0.026)	-0.209** (0.082)	-0.049*** (0.017)	-0.019*** (0.002)	-0.064 (0.130)	-0.017*** (0.002)
Income loss	-0.000 (0.000)	-0.000 (0.002)	-0.000 (0.000)	-0.003** (0.001)	-0.001 (0.001)	-0.004* (0.002)
Cons	0.356*** (0.058)	0.980*** (0.224)	0.355*** (0.060)	0.766*** (0.236)	2.352*** (0.586)	0.487 (0.371)
N	4,212	772	3,440	4,190	941	3,249

Note: Own calculations based on the DFG Rural Village and Rural Household Surveys 2007, 2008 and 2010 in Vietnam and Thailand. All time varying variables, except severity of shocks, refer to base period value. Robust standard errors in parentheses. \* Significance at the 10% level, \*\* Significance at the 5% level, and \*\*\* Significance at the 1% level.