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# Subjective well-being and social comparison: A comparative study on rural Thailand and Vietnam*

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**Abstract**

This paper analyzes the determinants of the households' welfare perception using a survey database on rural areas in Thailand and Vietnam which have similar economic and social conditions. Welfare perception corresponds to the households' subjective assessment of their general situations. We focus on the social comparison and take into account geographical isolation, relative poverty, harsh living conditions, economic and environmental risks as well as the households' degree of risk acceptance. Our study shows that households, in both countries, are sensitive to income and relative poverty, but only Thai households are concerned with wealth comparison. In particular, this comparison is asymmetric. Environmental risks as well as households' attitude to risks differently affect the households' well-being in both countries. However, we observe a similarity in the effect of the risks' monetary consequences.

*Key words*: environmental risks, economic risks; rural area, social comparison; subjective well-being

*JEL classification*: I31; O12; Q56

## 1. Introduction

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While standard economic theory assumes that individual utility is derived from the absolute level of consumption or income, numerous empirical and experimental investigations shed light on the phenomenon of relative standing (Luttmer, 2005, Alpizar et al. 2005 Ferrer-i-Carbonelle, 2005, Carlsson et al. 2007, Clark et al. 2008, Fafchamps and Shilpi, 2008, etc.). This finding corroborates the idea of a social comparison already present in *The Theory of Moral Sentiment* (Smith, 1759) and more recently in *The Social Limits to Growth* (Hirsch, 1976). Following this idea, people derive satisfaction not only from their absolute position in terms of material conditions (consumption, income) but also from their relative position compared to their peers. Individuals have a tendency to compare their position to a reference point. This comparison behavior may be motivated by the desire to acquire a social status, which brings about social esteem, respect, and admiration for individuals.

Empirical investigations also underline that relative income may matter differently according to the groups of individuals. In particular, the rich might care more about their relative wealth than the poor. This asymmetry in individual preferences for relative income was shown for instance in Ravallion and Lokshin (2010). Using Malawian data, the authors found that the relative income has no effect on the poor's subjective well-being, but a significant effect on the rich's subjective well-being. The same result was obtained by Akay and Martinsson (2001) using data on rural Ethiopia. McBride (2001) underlined that the relative income effect is stronger in the group of rich people than in the group of poor people. The opposite is found for the absolute income effect. The asymmetry of the social comparison is also reflected by the differentiated effect of the reference level. Reference income effect varies according to whether the individual's income is higher or lower than the reference level (Ferrer-i-Carbonell, 2005, Tsui, 2014). The result of Ferrer-i-Carbonell (2005), using data from German surveys (GSOEP), showed that individuals compare their income with that of their richer counterparts. This finding supports Duesenberry (1949)'s idea of an upward comparison. The poorer individuals compare their income to that of their richer peers, while the richer individuals do not become happier when their income is higher than that of their poorer peers. In the same vein, Tsui (2014) considers two different reference incomes for an individual: an average of other individuals' incomes higher than his own income and an average of other individuals' incomes lower than his own income. The result shows that an increase in the low average has a smaller effect on the subjective well-being than an increase in the high average.

Papers in this literature mainly focus on the socio-economic aspects and ignore the issues of environmental quality or natural disasters. In the case of developing countries, households living conditions are significantly affected by natural disasters and environmental vulnerability (Nguyen et al. 2013, Arouri et al. 2015). Disasters cause important losses in developing countries and the poor are likely the first victims (Ludwig et al. 2007). Rural and poor households are vulnerable to environmental shocks and suffer several consequences of natural disasters. Arouri et al. (2015) showed that the natural disasters (storms, floods and droughts) have negative effects on income and expenditure of rural households in Vietnam. Kurosaki (2014) investigated the household consumption response to natural disasters (floods and droughts) and health shocks using data from rural Pakistan. Results showed that the

consumption response differs across different types of household, in particular younger and more landed households are less vulnerable to floods (in terms of a decline in consumption).

This paper fits in the literature of subjective well-being using the data from surveys on rural households in Vietnam and Thailand, and focuses on the effects of economic and environmental risks as well as on relative standing. First, we provide a test for the relative standing with special attention to the asymmetric comparison hypothesis. Second, for the case of developing countries such as Vietnam and Thailand, this paper cares about some characteristics of the poor rural areas such as environmental and economic risks and vulnerability, harsh living conditions. Vulnerability encompasses not only the households' economic circumstances but also their situation related to the natural and geographical environment. Finally, we also analyze the nexus between households' welfare perception and self-assessment of general risk attitude. Welfare perception corresponds to the households' subjective assessment about their general situation. A households' attitude towards risks correspond to their readiness in case of economic and environmental risks.

Our study shows a significant effect of income on the households' subjective well-being for two countries. Moreover, households are sensitive to relative poverty, i.e. earning an income lower than the village's average level, makes households feel worse off than the previous year or 5 previous years. However, when considering the average income at the village level, we show that this reference income has no significant effect on the households' subjective well-being.

Concerning the wealth comparison, only Thai households care about social comparison regarding their wealth. They are asked to estimate if their wealth is better off than that of their village and that of the country. Results show that the comparison at the country level has an effect on the households' welfare. More precisely, Thai households feel happier compared to the past when estimating that their wealth is better off than the national average level. This means that people do not compare themselves to their peers in the same village, but rather to others at the national level. Given that this data concerns 3 poor and rural provinces in Thailand, this result may be interpreted as an upward comparison, and the reference at the national level, to which people compare their wealth, may be considered as a high reference.

Our results also show that natural risks (drought, flooding, heavy ice rain) differently affect the households' well-being in both countries. However, if these events in the past reduce their consumption, then this consumption reduction prevents them from being happy in the present compared to the previous year or 5 previous years. We also observe a similarity in the impact of economic shocks (pests or livestock disease). Concerning the effect of risk attitude, our results for Vietnam case indicate that those who are more ready to accept risks feel better off in the present compared to the previous or 5 previous years.

Estimation results show that the households' preferences in two countries are not identical and they are explained by different elements. Common points between the two groups of households concern only the effect of income and relative poverty and the effect of the risks' monetary consequences. Findings derived from the analysis of subjective well-being and its determinants can have important policy implications, in particular for developing countries

where income inequality is high compared to developed countries. If only absolute income matters, public policy should focus on the reduction of absolute poverty. If relative poverty affects the individuals' well-being, policy makers should pay attention to poverty and inequality reduction in order to improve the happiness of the population. Moreover, results on the effects of natural disasters give some insights on environmental policies in both countries, in particular in terms of preventive policies.

The remainder of the paper is organized as follows: Section 2 provides a survey on subjective well-being focusing on low income countries. Section 3 presents the data and descriptive statistics. The econometric model and estimation results are presented in Sections 4 and 5 respectively. Section 6 concludes.

## 2. Subjective well-being and social comparison

Most studies in the literature on subjective well-being underline a phenomenon of relative standing, contrary to the absolute utility hypothesis which is usually postulated in standard economic modelling. The relative standing effects differ between developed and developing countries, as well as between rich and poor individuals in a same country. In the case of developed countries, there is a consensus that reference level exerts a negative effect on the individual subjective well-being or life satisfaction, which is considered as a proxy of individual utility (McBride, 2001, Frijters et al., 2004, Luttmer, 2005, Ferrer-i-Carbonell, 2005, Clark et al., 2008, etc.). For example, Luttmer (2005) used the US data from the National Survey of Families and Households and considered the neighbors' earnings as a reference to which individuals compare their earnings. This study provides evidence that the reference level has a negative impact on the individuals' self-reported well-being. In particular, the magnitude of the effect on well-being of an increase in neighbors' earnings and that of a decrease in one's own income are roughly similar.

Individuals may compare their situation to an external reference (others) as well as to an internal reference (one's past income or expected future income). Using the Spanish Continuous Family Expenditure Survey, Alvarez-Cuadrado et al. (2012) estimated the importance of the interdependence of preferences and habits persistence. Their results suggest that households' preferences derive almost 25% of their consumption services from comparison between their consumption and that of their neighbors, and around 35% from comparison between their current and past consumption. This implies that around 60% of individual satisfaction is from relative consumption.

Contrary to a great number of studies using data on developed countries which underline a significant impact of relative income, some studies using data on developing and low income countries give a different picture. In the latter, there is not systematically a meaningful effect of relative concern on subjective well-being. Within a country, relative income matters differently between the rich and the poor people. The effect of relative standing on the well-being arises for the rich while it may be absent for the poor. For the latter, the effect of absolute income is often more significant (Clark et al., 2008, Akay and Martinsson, 2011, Asadullah and Chaudhury, 2012). In particular, Asadullah and Chaudhury (2012), using data from rural Bangladesh, showed that the relative wealth effect is stronger for the rich.

However, when comparing the relative wealth effect to the absolute wealth effect, the result indicates that the relative wealth effect is lower. Ravallion and Lokshin (2010), using Malawian data, found that relative income has no effect on the poor's subjective well-being. The same result was observed by Akay and Martinsson (2011) based on data from Ethiopia. For the rural areas of northern Ethiopia, one of the poorest regions in the world, relative income does not matter at all. These studies using data on poor countries show only a significant effect of absolute income.

Focusing on the effect of relative consumption for the case of Nepal, Fafchamps and Shilpi (2008) gave two different findings based on the type of the poor population. The authors confirm the fact that the poor care less about relative consumption than the non-poor. However, when focusing on the poor households who are isolated from markets, this conclusion changes. Households in isolated areas are more sensitive to their neighbors' standards of living. Moreover, controlling for a migration variable, the authors showed that household heads having migrated out of their birth district continue to compare their consumption with that of households in their district of origin.

Our study concerns 3 rural provinces of Vietnam and 3 rural provinces of Thailand. The next section will provide some insights into the data concerning these two developing countries.

## 3. Data

The data used in this paper comes from a rich survey database on "Impact of Shocks on the Vulnerability to Poverty: Consequences for Development of Emerging Southeast Asian Economies" in Vietnam and Thailand, collected by the DFG (German Research Foundation) FOR 756. Our analysis covers the 2010 wave of this survey.[1] Table A1 in the Appendix summarizes the definition of variables concerning socio-demographic and economic conditions of the households as well as environmental and economic events which occur during 2 years before the survey. Descriptive statistics are reported in Table A2 for the Vietnamese data and in Table A3 for the Thai data.

Two measures of household's subjective well-being are available in the data. They are defined in comparison to either the year before the survey or the 5 previous years. In response to the questions "Do you think your household is better off than last year?" and "Do you think your household is better off than 5 years ago?", households are asked to report their answer on an increasing scale: 1 (much better off), 2 (better off), 3 (same as), 4 (worse off), and 5 (much worse off). Given that for both measures, categories 1 and 5 have very few observations, we then merge categories 1 and 2 into one group, and categories 4 and 5 into another group to create two new 3-categories variables. The first one is subjective well-being compared to the previous year: $SWB$ = 1 if the household's well-being is worse off or much worse off than the previous year, = 2 if it is the same as the previous year, = 3 if it is better off or much better off. The other variable, subjective well-being compared to the previous five years, $SWB5$, is defined similarly. The final dataset obtained from the 2010 wave contains 1389 households (for both $SWB$ and $SWB5$) from 199 villages in 3 Thai provinces (Buriram, Ubon

[1] The area of the survey is illustrated in Figure A1.

Ratchathani, and Nakhon Phanom) and 1197 households (for $SWB$) and 1200 households (for $SWB5$) observed from 152 villages in three Vietnamese provinces (Ha Tinh, Dak Lak, and Thua Thien-Hue). Table 1 reports the distribution of these two subjective variables. We remark that when comparing to the 5 previous years, a majority of households in both countries think that their situation is better or much better off. However, comparing to the previous year, the most frequent answer is "the same as" (the previous year) for Vietnamese households and "better or much better off" for Thai households.

Table 1: Distribution of household subjective well-being

| | Vietnam | | Thailand | |
|---|---|---|---|---|
| *Compared to the previous year (**SWB**)* | Frequency | Percent | Frequency | Percent |
| Much worse off or worse off ($\boldsymbol{SWB = 1}$) | 336 | 28.00 | 292 | 21.02 |
| Same as ($\boldsymbol{SWB = 2}$) | 493 | 41. 08 | 537 | 38.66 |
| Better off or much better off ($\boldsymbol{SWB = 3}$) | 371 | 30.92 | 560 | 40.32 |
| *Compared to 5 previous years (**SWB5**)* | | | | |
| Much worse off or worse off ($\boldsymbol{SWB5 = 1}$) | 269 | 22.47 | 323 | 23.25 |
| Same as ($\boldsymbol{SWB5 = 2}$) | 256 | 21.39 | 320 | 23.04 |
| Better off or much better off ($\boldsymbol{SWB5 = 3}$) | 672 | 56.14 | 746 | 53.71 |

Notes. Number of observations: 1197 ($SWB$) and 1200 ($SWB5$) for Vietnam, 1389 for Thailand.

Table 2: Distribution of household subjective wealth

| | Vietnam | | Thailand | |
|---|---|---|---|---|
| *Compared to the village* | Frequency | Percent | Frequency | Percent |
| Much worse off or worse off | 447 | 37.25 | 289 | 20.81 |
| Same as | 576 | 48.00 | 914 | 65.80 |
| Better off or much better off | 177 | 14.75 | 186 | 13.39 |
| *Compared to country* | | | | |
| Much worse off or worse off | 731 | 60.92 | 719 | 51.76 |
| Same as | 386 | 32.17 | 556 | 40.03 |
| Better off or much better off | 83 | 6. 92 | 114 | 8.21 |

Notes. Number of observations: 1200 for Vietnam, 1389 for Thailand.

Table 2 describes the distribution of self-assessment of household wealth, compared to the village and to the country. Households are asked to estimate whether their wealth is better off than that of their village and that of the country. Compared to the village, the most frequent answer is "the same as" other households with 65.8% for Thai households and 48% for Vietnamese households. The most frequent answer regarding the comparison with the country is more pessimistic as 60.92% of the sampled Vietnamese households and 51.76% of the Thai households think that their wealth if much worse or worse off than that of other households.

Another subjective variable concerns the degree of risk acceptance. It is about the self-assessment of general risk attitude. People are asked to respond, on an 11-point Likert scale, to the question "Are you generally a person who is fully prepared to take risks (10) or do you try to avoid taking risks (0)?". A higher value in the answer corresponds to a higher degree of

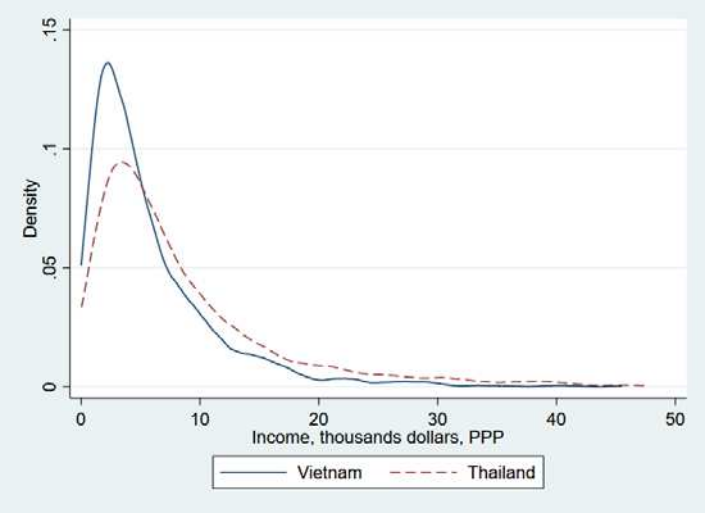


Figure 2: Distribution of household total annual income, in thousands dollars, PPP.

risk acceptance or a lower risk aversion. In order to eliminate the cases with an insufficient number of observations induced by the 11-point Likert scale, and to increase the variability of the risk variable, we refer to three levels of risk attitude: low risk acceptance (or risk avoidance), intermediate risk acceptance, and high risk acceptance. We create then three dummies corresponding to three levels of risk attitude: Risk_Avoidance = 1 if the answer is 0,1, 2 or 3, Risk_Neutrality = 1 if the answer is 4, 5, 6 or 7, and Risk_Acceptance = 1 if the answer is 8, 9 or 10.

Figure 2 displays the distribution of total household income in 2010. We observe that Thai households are slightly richer than their Vietnamese counterparts as the Thai income distribution is on the right of the Vietnamese income distribution. Table A1 gives us 6.04 and 9.21 (in thousands dollars, PPP) for the average income of Vietnamese and Thai households, respectively. We create a dummy variable (Poor) to account for the relative poverty of the households in the village: Poor is equal to 1 if the households' income is lower than the mean village level.

Table A1 also describes other variables regarding the households' characteristics (Mean village income, Average age in the household, Ethnic minority, health), living conditions (Access to electricity, Public water, Sanitation, Public waste disposal, Fixed line telephone, and Internet), village characteristics (Mountain, Slope, Valley, Lake, Coast, Travel distance to district town) and province dummies. For Vietnam, the ethnic minority variable is a dummy variable with 0 if household belongs to Kinh majority group and 1 if he belongs to an ethnic minority. Given that the majority of Vietnamese belong to Kinh ethnic (one of 54 ethnics) with around 85% of the total population, this variable contains a majority of 0, and about 15% of households belong to a minority ethnic. For the case of Thailand, Thai ethnic accounts for 92% of the population while the remaining 8 % of the population belong to the other ethnic minorities. Dummy variable Minority contains a majority of 0 as only about 5.6% of Thai households in our data belong to an ethnic minority. Environmental risks (Drought, Flooding of land, Heavy ice rain, Storm) and economic shocks (Business collapse, Pests or livestock disease) are represented by dummies. These events occurred between 05/2008 and 04/2010,

two years before the survey. We also use a dummy to control for the households' consumption reduction caused by these environmental and economic events.

## 4. Econometric specification

### 4.1. Relative utility function

Let us consider the general utility function of household *i*:

$$U_i = U(y_i, \bar{y}, w_i, \bar{w}, x_i) \quad (1)$$

where $y_i$ is the household income, $\bar{y}$ is a reference income level used for comparison purpose (for example, the average income of the household $i$'s village, region or country), $w_i$ the household wealth, $\bar{w}$ a wealth reference (for example the average wealth of the household $i$'s village), and $x_i$ the set of other observed determinants. The choice of this households' utility function depending on the average level of wealth and average level of income refers to the comparison phenomenon (Clark and Oswald, 1996, Frey and Stutzer, 2002, Luttmer, 2005, Akay and Martisson, 2011, etc.). People derive satisfaction not only from their absolute position in terms of material conditions but also from their relative position compared with their peers. In this specification, the average level of income $\bar{y}$ and that of wealth $\bar{w}$ are considered as reference levels to which households compare their absolute level. A negative impact of a reference level on the households' well-being implies that there exists an interpersonal comparison. The higher the reference level, the lower the households' utility, all other things remaining equal.

This general form of the utility function can be modified to fit with the available data. Indeed, working with data on rural Vietnam and Thailand, information on household wealth $w_i$ and reference wealth $\bar{w}$ are not separately provided. The only information available is a subjective assessment of wealth, corresponding to the households' subjective estimation of their wealth, in comparison with other residents at the village level or with other residents at the country level. It results in a binary indicator noting whether the household is wealthier or not compared to the average village or country level. Hence, we adapt the utility function (1) to account for this information from our data as follows:

$$U_i = U(y_i, \bar{y}, v(w_i, \bar{w}), x_i) \quad (2)$$

where the indicator component $v(w_i, \bar{w}) = 1(w_i < \bar{w})$ states whether household *i* is poorer compared to the average wealth level $\bar{w}$ (either at the village or the country level).

We can also use a binary indicator concerning income comparison as follows:

$$U_i = U(u(y_i, \bar{y}), v(w_i, \bar{w}), x_i) \quad (3)$$

where $u(y_i, \bar{y}) = 1(y_i < \bar{y})$ gives the information following that household *i* has an income lower or higher than the reference income $\bar{y}$. In the next section, we employ the dummy variable Poor which defines whether a household is poor or not (when its income is lower or higher than the average village income $\bar{y}$).

It should be noted that subjective well-being is reported in our data as a variation compared to the previous year or 5 previous years ($SWB$ or $SWB5$). Therefore, we should interpret the utility accordingly. We remark that the household $i$'s well-being, noted as $U_i^*$, is unobserved (or latent). It can be proxied by an observed subjective measure and augmented by an unobserved error term $\varepsilon_i$. If we note $U_i$ as the observed households' responses concerning their well-being, we can specify the following ordered probit model:

$$U_i^* = z_i'\beta + \varepsilon_i \tag{4}$$

$$U_i = 1 \text{ if } U_i^* \leq c_1$$

$$= 2 \text{ if } c_1 < U_i^* \leq c_2$$

$$= 3 \text{ if } c_2 < U_i^*$$

where $U_i$ corresponds to the observed subjective well-being reported by household $i$ (either $SWB$ or $SWB5$), and $\varepsilon_i$ is assumed to be independent and identically distributed. In this specification, parameters to be estimated are $\beta$ (the intercept is normalized to zero) and the thresholds $c_1$ and $c_2$.

The set of explanatory variables $z$ encompasses all the variables included in the arguments of the utility function, i.e. $y_i,\ \bar{y},\ 1(w_i, \bar{w}),\ x_i$. More precisely, $y_i,$ corresponds to the household total annual income, $\bar{y}$ corresponds to the average household income at the village level. Estimations also include the case where $y_i$ and $\bar{y}$ are replaced by the income comparison indicator $u(y_i, \bar{y}) = 1(y_i < \bar{y})$, denoted Poor as above. The regression with Poor also includes its interaction with Income (i.e. Poor*Income) to account for the asymmetric effect of Income on the households' subjective well-being. The set $x_i$ includes control variables for economic and environmental risks, degree of risk acceptance, dummy indicating the household head's good health , dummy indicating the household head suffering a serious disease, average age in the household, dummy for ethnic minority, percentages to access to several facilities (electricity, public water supply, sanitation, public waste disposal, fixed line telephone and internet), dummies for geographical characteristics of household $i$'s village (on a mountain, on a slope, in a valley, near a river, near a lake, on a coast and travel distance to district town), and dummies for provinces (provinces Dak Lak and Nakhon Phanom are used as the reference for the Vietnamese and Thai data, respectively).

### 4.2. Endogenous regressors

Estimation of the model above can be performed by maximum likelihood using village-clustered robust standard errors. In this specification, household income, income comparison indicator (i.e. Poor), and risk attitude (risk avoiding and risk acceptance) can be endogenous as they can be affected by unobserved factors.[2] In order to account for this endogeneity in the ordered probit model, we use the 'variable addition test' based on the control function approach proposed by Wooldridge (2014) to test for endogeneity of explanatory variables in nonlinear models. It can be implemented by using the following two-step procedure.

[2] Risk neutrality is used as a reference.

First, for the model with income and mean village income (i.e. with $y_i$ and $\bar{y}$), we make: i) a linear regression of household income (as it is a continuous variable), and: ii) a probit regression of household risk avoidance on the one hand, and risk acceptance on the other, on the whole set of the model's explanatory variables and additional instruments (which are excluded from the model). For the income regression, excluded instruments correspond to a dummy indicating the household head's ability to read and write, a dummy for the main occupation as agriculture, a dummy for membership of a political association (Communist Party, professional association, etc), a continuous variable for the house value and finally a variable for the proportion of males in the household.[3] These excluded instruments are also considered in the probit regressions of household risk attitude (i.e. Risk avoidance and Risk acceptance).

For the model with income comparison indicator (i.e. Poor), we apply a probit regression to Poor (as it is a binary variable), Risk avoidance, and Risk acceptance. The set of explanatory variables and excluded instruments for Poor, Income, Risk avoidance, and Risk acceptance are similarly defined as above.

Second, we compute the generalized residuals for these regressions of the first step and perform the usual ordered probit regression in equation (4) with these generalized residuals as additional explanatory variables. More precisely, we include generalized residuals corresponding to Income, Risk avoidance, and Risk acceptance in the regression using Income $y_i$ and Mean village income $\bar{y}$ (Model 1), on the one hand, and those corresponding to Income, Poor, Risk avoidance, and Risk acceptance in the regression using Poor (Model 2), on the other.

Finally, we compute a (village clustered) robust t-test for the null hypothesis that the coefficient of residuals is zero. The null hypothesis corresponds to the exogeneity of Income, Poor, Risk avoidance, and Risk acceptance. The test is called 'robust' because it is based on robust standard errors.

## 5. Estimation results

We use two different models to represent the social comparison: Model 1 with mean village income as a reference level to which households compare their income (equation (2)), and Model 2 with relative poverty as indicated in equation (3). Regressions are done with two measures of subjective well-being: *SWB* is the household subjective well-being compared to the previous year, and *SWB5* is the household subjective well-being compared to the 5 previous years.

The computed robust t-statistic of the variable addition test for endogeneity of income and risk attitude in Model 1 shows that these variables are exogenous for Vietnam and Thailand (both *SWB* and *SWB5*). Income, Poor and risk attitude are also exogenous in Model 2*,* for both countries. Marginal effects of all explanatory variables are reported in Tables 3-6. Notice that the marginal effect of an explanatory variable is calculated by maintaining other variables at

[3] Communist Party concerns only Vietnamese households.

their average values.[4] Estimated coefficients of the models are reported in Tables A4-A5 in the Appendix.

The results show that income is one of the key determinants of households' happiness in both countries. A higher income is inducive to a higher probability of feeling better off or much better off (*SWB*= 3 or *SWB5*=3), compared to the past (1 or 5 previous years). However, the income of other households living in the same village does not matter for both countries (Model 1). Moreover, when observing the results from Model 2, the interaction term Poor*Income is positive and significant, underlying an asymmetric effect of income, i.e. the income effect is higher for the poor than for the rich.

When analyzing the effect of relative poverty (Model 2), we observe a phenomenon of social comparison in terms of income. Estimation results reported in Tables A4-A5 show that households in both countries are sensitive to relative poverty as this variable exerts a negative and significant effect on their subjective well-being compared to the previous year (*SWB*) and the 5 previous years (*SWB5)*. This result is confirmed when analyzing the marginal effects of these two variables. For example, Table 5 (Model 2) indicates that for Vietnam, relative poverty (earning an income lower than the mean village level) makes households feel worse off than 5 previous years. Precisely, it has a negative effect on the probability of giving a high level of subjective of well-being, *SWB5* = 3 (better off or much better off) while it has a positive effect on the probability of giving lower levels of well-being, *SWB5* = 1 (worse off or much worse off), *SWB5* = 2 (same as). Likewise, Table 6 gives us the same observation regarding the marginal effects of relative poverty for Thailand.

Observations regarding the subjective self-assessment of household wealth show a great difference between two countries. We find out that Thai households are concerned by wealth comparison while Vietnamese households are not. Indeed, the effect of self-assessment of wealth comparison at the country level is meaningful for both measures of well-being, *SWB* and *SWB5,* for Thailand case. This implies that if households estimate that their wealth is better off than that of other residents at the country level, they would feel happier. Tables 4 and 6 indicate that a higher self-assessment of wealth increases the probability of giving a high value of subjective well-being ($SWB = 3$ or $SWB5 = 3$) and decreases the probabilities of giving lower values of subjective well-being ($SWB = 1$, $SWB = 2$ or $SWB5 = 1$, $SWB5 = 2$ ), all things remain unchanged.

Estimation also shows that the comparison at the village level does not exist. This difference between village and country level might be interpreted as an asymmetry of the social comparison in terms of wealth, and in particular the comparison is upward. Indeed, we remark that our data is composed of rural and poor provinces of Thailand, then, a comparison with other residents at the country level may be viewed as a comparison with a high reference.[5] In

[4] Notice that marginal effects of a variable on different probabilities, $\partial P(U_i = l)/\partial z_{ij}$ where $l$ = 1, 2, 3, sum up to 0, i.e. $\sum_{l=1}^{3} \partial P(U_i = l)/\partial z_{ij} = 0$.

[5] This result may be refereed to Tsui (2014) which proposes 2 reference levels, a high level and a low one. Tsui (2004) showed that individuals compare their income to the high reference rather to the low one.

this sense, considering themselves as wealthier than others at the country level may increase the households' subjective well-being.

Let us now consider variables concerning environmental risks such as drought, flooding of land, heavy ice rain and storm.[6] These events occurred in the past, during 2 years before the survey. Analyses indicate that drought, flooding of land and heavy ice rain in the past increase the good feelings in the present for Vietnamese households while drought in the past increase the good feelings in the present for Thai households. It is not surprising to find out that environmental risks in the past have a positive effect on the fact that households feel better off than 1 previous year or 5 previous years. This means that by looking at natural disasters in the past, households would feel better off in the present. However, if these events reduce the households' consumption, they will also reduce their subjective well-being. The estimated parameter linked to this variable (i.e. consumption reduction) is significantly negative for both countries. These results let us interpret that the monetary consequence of natural disasters and economic shocks on the households' well-being persist while the effects of events themselves do not. Besides, when considering two economic shocks, pests or livestock disease and collapse of business during 2 years before the survey, only the pests or livestock disease is meaningful for the Thai households' subjective well-being.

In connection with these environmental and economic events, we are interested in the effect of households' risk attitude. This variable measures the degree of risk acceptance: a higher value implies a higher degree of acceptance and then a lower risk aversion. The estimated coefficient shows a difference in this variable's effect between two countries. For the Vietnam case, we observe that that those who are less risk averse feel better off in the present than the previous year or 5 previous years, *ceteris paribus*. For Thailand, this variable has no effect.

We also observe a difference in effects of other variables on the households' subjective well-being in both countries. Regarding living conditions, we find out that the subjective well-being of Vietnamese households in a village is increasing with the proportion of village's households having access to electricity. Other living conditions such as access to public water supply, to sanitation, to internet, etc. have no impact on both Thai and Vietnamese households' well-being. Households living in different geographic conditions may feel their happiness differently. While people living on a mountain are happier for the case of Vietnam, they are less happy for the case of Thailand. However, living near a river could decrease the good feelings for Vietnamese households while it might have no effect on the good feelings for Thai households.

Concerning different provinces in our data, for Vietnam, compared to those living in Dak Lak province (all things remain unchanged), households in Ha Tinh province may feel better off than 1 previous year. For Thailand, households in Buriram province are less happy compared to the 5 previous years while households in Ubon Ratchathan are happier compared to 1 previous year (Nakhon Phanom province as a reference).

[6] For Thailand, we do not take into account "heavy ice rain" as this variable has few observations.

Table 3: Marginal effects, the case of *SWB*, Vietnam.

| | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| Variable | *P(SWB=1)* | *P(SWB=2)* | *P(SWB=3)* | *P(SWB=1)* | *P(SWB=2)* | *P(SWB=3)* |
| Income | -0.00696*** | -0.000421 | 0.00738*** | -0.0141*** | -0.00311* | 0.0172*** |
| | (0.00226) | (0.000342) | (0.00246) | (0.00377) | (0.00165) | (0.00524) |
| Mean village income | 0.000921 | 5.58e-05 | -0.000977 | -- | -- | -- |
| | (0.00498) | (0.000305) | (0.00528) | | | |
| Poor | -- | -- | | 0.121*** | 0.0268** | -0.148*** |
| | | | | (0.0338) | (0.0136) | (0.0453) |
| Subjective wealth, wrt village | 0.0134 | 0.000811 | -0.0142 | 0.0186 | 0.00412 | -0.0228 |
| | (0.0194) | (0.00130) | (0.0206) | (0.0180) | (0.00406) | (0.0218) |
| Subjective wealth, wrt country | -0.0300 | -0.00182 | 0.0318 | -0.0238 | -0.00526 | 0.0291 |
| | (0.0232) | (0.00192) | (0.0246) | (0.0216) | (0.00487) | (0.0262) |
| Drought | -0.0735* | -0.00445 | 0.0779* | -0.0727** | -0.0161* | 0.0888** |
| | (0.0382) | (0.00370) | (0.0403) | (0.0354) | (0.00851) | (0.0424) |
| Flooding | -0.105*** | -0.00635 | 0.111*** | -0.0915*** | -0.0202** | 0.112*** |
| | (0.0363) | (0.00479) | (0.0383) | (0.0342) | (0.00939) | (0.0413) |
| Heavy rain | -0.0955* | -0.00578 | 0.101* | -0.0803 | -0.0177 | 0.0980 |
| | (0.0536) | (0.00506) | (0.0567) | (0.0497) | (0.0119) | (0.0603) |
| Storm, landslide | 0.0558 | 0.00338 | -0.0592 | 0.0435 | 0.00960 | -0.0531 |
| | (0.0407) | (0.00333) | (0.0431) | (0.0381) | (0.00878) | (0.0464) |
| Pests or livestock disease | -0.0504* | -0.00305 | 0.0535* | -0.0483* | -0.0107* | 0.0589* |
| | (0.0296) | (0.00254) | (0.0311) | (0.0273) | (0.00643) | (0.0329) |
| Collapse of business | -0.0537 | -0.00325 | 0.0570 | -0.0352 | -0.00776 | 0.0429 |
| | (0.0996) | (0.00627) | (0.106) | (0.0873) | (0.0190) | (0.106) |
| Consumption reduction | 0.0866*** | 0.00525 | -0.0919*** | 0.0764*** | 0.0169** | -0.0932*** |
| | (0.0264) | (0.00357) | (0.0272) | (0.0247) | (0.00655) | (0.0290) |
| Risk avoidance | 0.101*** | 0.00612 | -0.107*** | 0.0892*** | 0.0197*** | -0.109*** |
| | (0.0223) | (0.00418) | (0.0230) | (0.0209) | (0.00671) | (0.0242) |
| Risk acceptance | -0.170*** | -0.0103 | 0.180*** | -0.161*** | -0.0356** | 0.197*** |
| | (0.0377) | (0.00769) | (0.0410) | (0.0344) | (0.0147) | (0.0447) |
| Good health | 0.0126 | 0.000762 | -0.0134 | 0.0132 | 0.00290 | -0.0161 |
| | (0.0276) | (0.00174) | (0.0293) | (0.0252) | (0.00558) | (0.0307) |
| Suffering from serious disease | 0.0442* | 0.00268 | -0.0469* | 0.0423* | 0.00935* | -0.0517* |
| | (0.0240) | (0.00232) | (0.0254) | (0.0223) | (0.00536) | (0.0268) |
| Average age | -0.000547 | -3.31e-05 | 0.000580 | -0.000522 | -0.000115 | 0.000638 |
| | (0.000815) | (5.26e-05) | (0.000863) | (0.000751) | (0.000168) | (0.000915) |
| Ethnic minority | -0.0363 | -0.00220 | 0.0385 | -0.0304 | -0.00671 | 0.0371 |
| | (0.0351) | (0.00270) | (0.0373) | (0.0323) | (0.00750) | (0.0395) |
| Access to electricity | -0.255*** | -0.0154 | 0.270*** | -0.220*** | -0.0485** | 0.268*** |
| | (0.0742) | (0.0117) | (0.0793) | (0.0694) | (0.0208) | (0.0841) |
| Access to public water supply | 0.00536 | 0.000325 | -0.00569 | 0.00993 | 0.00219 | -0.0121 |
| | (0.0308) | (0.00191) | (0.0327) | (0.0287) | (0.00645) | (0.0351) |
| Access to sanitation | -0.0246 | -0.00149 | 0.0261 | -0.0146 | -0.00323 | 0.0179 |
| | (0.0479) | (0.00303) | (0.0507) | (0.0443) | (0.00975) | (0.0540) |
| Access to public waste | 0.0867 | 0.00525 | -0.0919 | 0.0752 | 0.0166 | -0.0918 |
| | (0.0783) | (0.00589) | (0.0830) | (0.0721) | (0.0164) | (0.0877) |
| Access to fixed line telephone | 0.0258 | 0.00156 | -0.0274 | 0.0240 | 0.00529 | -0.0293 |
| | (0.0537) | (0.00344) | (0.0570) | (0.0511) | (0.0114) | (0.0623) |
| Access to internet | -0.350 | -0.0212 | 0.371 | -0.293 | -0.0647 | 0.358 |
| | (0.321) | (0.0246) | (0.341) | (0.292) | (0.0677) | (0.357) |
| Travel distance to district town | -0.00108 | -6.55e-05 | 0.00115 | -0.000849 | -0.000188 | 0.00104 |
| | (0.00119) | (8.60e-05) | (0.00126) | (0.00109) | (0.000241) | (0.00133) |
| Mountain | -0.0637** | -0.00386 | 0.0675** | -0.0587** | -0.0130** | 0.0717** |
| | (0.0262) | (0.00288) | (0.0275) | (0.0246) | (0.00617) | (0.0294) |
| Slope | 0.0306 | 0.00185 | -0.0324 | 0.0196 | 0.00433 | -0.0239 |
| | (0.0355) | (0.00258) | (0.0378) | (0.0328) | (0.00730) | (0.0400) |
| Valley | -0.0657 | -0.00398 | 0.0696 | -0.0579 | -0.0128 | 0.0707 |
| | (0.0481) | (0.00394) | (0.0509) | (0.0456) | (0.0102) | (0.0550) |
| River | 0.00856 | 0.000519 | -0.00908 | 0.00694 | 0.00153 | -0.00847 |
| | (0.0383) | (0.00235) | (0.0406) | (0.0363) | (0.00798) | (0.0442) |
| Lake | 0.00526 | 0.000319 | -0.00558 | 0.00667 | 0.00147 | -0.00814 |
| | (0.0317) | (0.00195) | (0.0336) | (0.0287) | (0.00637) | (0.0350) |
| Coast | 0.0263 | 0.00160 | -0.0279 | 0.0230 | 0.00508 | -0.0281 |
| | (0.0412) | (0.00287) | (0.0438) | (0.0371) | (0.00867) | (0.0456) |
| Ha Tinh | -0.135*** | -0.00818 | 0.143*** | -0.135*** | -0.0298** | 0.165*** |
| | (0.0394) | (0.00601) | (0.0416) | (0.0378) | (0.0123) | (0.0461) |
| Thua Thien Hue | -0.0591 | -0.00358 | 0.0627 | -0.0640 | -0.0141 | 0.0781 |
| | (0.0495) | (0.00385) | (0.0525) | (0.0448) | (0.0106) | (0.0546) |

Notes: Model 1 corresponds to regressions with Income and Mean village income. Model 2 corresponds to regressions with Income and Poor (including their interaction). All explanatory variables are exogenous. Significance levels: ** 5%, *** 1%. Number of observations: 1200.

Table 4: Marginal effects, the case of *SWB*, Thailand.

| | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| Variable | *P(SWB=1)* | *P(SWB=2)* | *P(SWB=3)* | *P(SWB=1)* | *P(SWB=2)* | *P(SWB=3)* |
| Income | -0.00376*** | -0.00139*** | 0.00515*** | -0.00775*** | -0.00423*** | 0.0120*** |
| | (0.00128) | (0.000499) | (0.00176) | (0.00203) | (0.00153) | (0.00349) |
| Mean village income | -0.000814 | -0.000301 | 0.00111 | -- | -- | -- |
| | (0.00114) | (0.000418) | (0.00155) | | | |
| Poor | -- | -- | -- | 0.0928*** | 0.0506** | -0.143*** |
| | | | | (0.0300) | (0.0215) | (0.0508) |
| Subjective wealth, wrt village | 0.00185 | 0.000682 | -0.00253 | 0.00521 | 0.00284 | -0.00805 |
| | (0.0157) | (0.00582) | (0.0216) | (0.0143) | (0.00782) | (0.0221) |
| Subjective wealth, wrt country | -0.0377** | -0.0139** | 0.0516** | -0.0336** | -0.0183** | 0.0519** |
| | (0.0152) | (0.00585) | (0.0208) | (0.0139) | (0.00772) | (0.0212) |
| Drought | -0.0560** | -0.0207** | 0.0767** | -0.0462** | -0.0252** | 0.0714** |
| | (0.0231) | (0.00843) | (0.0313) | (0.0210) | (0.0114) | (0.0320) |
| Flooding | 0.00301 | 0.00111 | -0.00412 | 0.00506 | 0.00276 | -0.00782 |
| | (0.0308) | (0.0114) | (0.0421) | (0.0280) | (0.0153) | (0.0433) |
| Storm, landslide | -0.108 | -0.0398 | 0.148 | -0.0991 | -0.0540 | 0.153 |
| | (0.0980) | (0.0362) | (0.134) | (0.0912) | (0.0503) | (0.141) |
| Pests or livestock disease | -0.0570 | -0.0210 | 0.0780 | -0.0488 | -0.0266 | 0.0754 |
| | (0.0434) | (0.0163) | (0.0595) | (0.0387) | (0.0216) | (0.0601) |
| Collapse of business | 0.0267 | 0.00986 | -0.0365 | 0.0265 | 0.0145 | -0.0410 |
| | (0.0741) | (0.0273) | (0.101) | (0.0675) | (0.0368) | (0.104) |
| Consumption reduction | 0.0435** | 0.0161** | -0.0596** | 0.0401** | 0.0218** | -0.0619** |
| | (0.0205) | (0.00767) | (0.0280) | (0.0189) | (0.0103) | (0.0288) |
| Risk avoidance | 0.0230 | 0.00848 | -0.0314 | 0.0185 | 0.0101 | -0.0286 |
| | (0.0192) | (0.00703) | (0.0262) | (0.0178) | (0.00951) | (0.0273) |
| Risk acceptance | -0.0189 | -0.00700 | 0.0259 | -0.0147 | -0.00800 | 0.0227 |
| | (0.0259) | (0.00948) | (0.0353) | (0.0232) | (0.0127) | (0.0359) |
| Good health | -0.0281 | -0.0104 | 0.0385 | -0.0236 | -0.0129 | 0.0365 |
| | (0.0279) | (0.0104) | (0.0383) | (0.0257) | (0.0141) | (0.0397) |
| Suffering from serious disease | -0.0234 | -0.00863 | 0.0320 | -0.0181 | -0.00988 | 0.0280 |
| | (0.0255) | (0.00945) | (0.0349) | (0.0234) | (0.0128) | (0.0361) |
| Average age | -0.00118 | -0.000437 | 0.00162 | -0.00119 | -0.000649 | 0.00184 |
| | (0.000916) | (0.000340) | (0.00125) | (0.000831) | (0.000462) | (0.00129) |
| Ethnic minority | -0.0379 | -0.0140 | 0.0519 | -0.0375 | -0.0205 | 0.0580 |
| | (0.0481) | (0.0176) | (0.0656) | (0.0440) | (0.0240) | (0.0679) |
| Access to electricity | 0.301 | 0.111 | -0.413 | 0.257 | 0.140 | -0.397 |
| | (0.187) | (0.0683) | (0.254) | (0.174) | (0.0937) | (0.266) |
| Access to public water supply | 0.0444* | 0.0164* | -0.0608* | 0.0434* | 0.0237* | -0.0671* |
| | (0.0263) | (0.00968) | (0.0358) | (0.0236) | (0.0128) | (0.0360) |
| Access to sanitation | -0.0135 | -0.00497 | 0.0184 | -0.0155 | -0.00847 | 0.0240 |
| | (0.0406) | (0.0150) | (0.0556) | (0.0364) | (0.0197) | (0.0561) |
| Access to public waste disposal | -0.0182 | -0.00672 | 0.0249 | -0.0173 | -0.00944 | 0.0268 |
| | (0.0259) | (0.00961) | (0.0355) | (0.0240) | (0.0132) | (0.0371) |
| Access to fixed line telephone | 0.0133 | 0.00492 | -0.0182 | 0.0130 | 0.00709 | -0.0201 |
| | (0.0276) | (0.0103) | (0.0379) | (0.0255) | (0.0140) | (0.0395) |
| Access to internet | -0.0518 | -0.0191 | 0.0710 | -0.0563 | -0.0307 | 0.0870 |
| | (0.0844) | (0.0312) | (0.116) | (0.0853) | (0.0467) | (0.132) |
| Travel distance to district town | -0.000239 | -8.82e-05 | 0.000327 | -0.000262 | -0.000143 | 0.000404 |
| | (0.00103) | (0.000382) | (0.00141) | (0.000933) | (0.000511) | (0.00144) |
| Mountain | 0.214*** | 0.0792*** | -0.294*** | 0.188*** | 0.102*** | -0.290*** |
| | (0.0289) | (0.0139) | (0.0400) | (0.0303) | (0.0190) | (0.0443) |
| Slope | 0.0271 | 0.0100 | -0.0371 | 0.0254 | 0.0139 | -0.0393 |
| | (0.0382) | (0.0141) | (0.0523) | (0.0350) | (0.0191) | (0.0540) |
| Valley | 0.101*** | 0.0375*** | -0.139*** | 0.0809*** | 0.0441*** | -0.125*** |
| | (0.0240) | (0.0110) | (0.0344) | (0.0217) | (0.0137) | (0.0342) |
| River | -0.0442* | -0.0163* | 0.0605* | -0.0375* | -0.0204* | 0.0579* |
| | (0.0236) | (0.00850) | (0.0319) | (0.0222) | (0.0117) | (0.0336) |
| Buriram | 0.0447 | 0.0165 | -0.0612 | 0.0424 | 0.0231 | -0.0655 |
| | (0.0342) | (0.0129) | (0.0469) | (0.0308) | (0.0173) | (0.0479) |
| Ubon Ratchathani | -0.0562* | -0.0207* | 0.0769* | -0.0504* | -0.0275* | 0.0779* |
| | (0.0319) | (0.0115) | (0.0432) | (0.0294) | (0.0157) | (0.0447) |

Notes: Model 1 corresponds to regressions with Income and Mean village income. Model 2 corresponds to regressions with Income and Poor (including their interaction). All explanatory variables are exogenous. Significance levels: * 10% ** 5%, *** 1%. Number of observations: 1389.

Table 5: Marginal effects, the case of *SWB5*, Vietnam.

| Variable | Model 1 | | | Model 2 | | |
|---|---|---|---|---|---|---|
| | *P(SWB5=1)* | *P(SWB5=2)* | *P(SWB5=3)* | *P(SWB5=1)* | *P(SWB5=2)* | *P(SWB5=3)* |
| Income | -0.0114*** | -0.00471*** | 0.0161*** | -0.0127*** | -0.00713*** | 0.0198*** |
| | (0.00255) | (0.00114) | (0.00358) | (0.00336) | (0.00246) | (0.00569) |
| Mean village income | 0.00979** | 0.00406* | -0.0138** | -- | -- | -- |
| | (0.00497) | (0.00209) | (0.00703) | | | |
| Poor | -- | -- | -- | 0.166*** | 0.0934*** | -0.260*** |
| | | | | (0.0312) | (0.0257) | (0.0548) |
| Subjective wealth, wrt village | -0.00205 | -0.000851 | 0.00290 | 0.00577 | 0.00324 | -0.00901 |
| | (0.0178) | (0.00737) | (0.0251) | (0.0157) | (0.00879) | (0.0245) |
| Subjective wealth, wrt country | -0.00712 | -0.00295 | 0.0101 | 0.00129 | 0.000723 | -0.00201 |
| | (0.0207) | (0.00854) | (0.0292) | (0.0183) | (0.0103) | (0.0286) |
| Drought | -0.0244 | -0.0101 | 0.0346 | -0.0288 | -0.0161 | 0.0449 |
| | (0.0376) | (0.0155) | (0.0531) | (0.0331) | (0.0187) | (0.0517) |
| Flooding | -0.139*** | -0.0574*** | 0.196*** | -0.119*** | -0.0669*** | 0.186*** |
| | (0.0368) | (0.0156) | (0.0514) | (0.0331) | (0.0185) | (0.0498) |
| Heavy ice rain | -0.155*** | -0.0642*** | 0.219*** | -0.126** | -0.0706** | 0.196** |
| | (0.0577) | (0.0237) | (0.0806) | (0.0535) | (0.0288) | (0.0811) |
| Storm, landslide | -0.00934 | -0.00387 | 0.0132 | -0.0201 | -0.0113 | 0.0314 |
| | (0.0352) | (0.0146) | (0.0498) | (0.0310) | (0.0171) | (0.0481) |
| Pests or livestock disease | -0.0580* | -0.0240* | 0.0820* | -0.0544* | -0.0305** | 0.0849** |
| | (0.0312) | (0.0126) | (0.0435) | (0.0278) | (0.0147) | (0.0421) |
| Collapse of business | -0.0564 | -0.0234 | 0.0798 | -0.0322 | -0.0181 | 0.0503 |
| | (0.0898) | (0.0369) | (0.127) | (0.0736) | (0.0405) | (0.114) |
| Consumption reduction | 0.0483* | 0.0200* | -0.0683* | 0.0389* | 0.0218* | -0.0607* |
| | (0.0261) | (0.0110) | (0.0369) | (0.0232) | (0.0131) | (0.0360) |
| Risk avoidance | 0.120*** | 0.0496*** | -0.169*** | 0.101*** | 0.0568*** | -0.158*** |
| | (0.0208) | (0.0106) | (0.0302) | (0.0189) | (0.0120) | (0.0288) |
| Risk acceptence | -0.0997** | -0.0414** | 0.141** | -0.0949** | -0.0533** | 0.148** |
| | (0.0466) | (0.0195) | (0.0657) | (0.0413) | (0.0234) | (0.0638) |
| Good health | -0.000351 | -0.000145 | 0.000496 | 0.000206 | 0.000116 | -0.000322 |
| | (0.0301) | (0.0125) | (0.0426) | (0.0267) | (0.0150) | (0.0417) |
| Suffering from serious disease | 0.00416 | 0.00173 | -0.00589 | 0.00298 | 0.00167 | -0.00465 |
| | (0.0261) | (0.0108) | (0.0370) | (0.0228) | (0.0128) | (0.0356) |
| Average age | -0.000472 | -0.000196 | 0.000668 | -0.000467 | -0.000262 | 0.000729 |
| | (0.000732) | (0.000305) | (0.00104) | (0.000636) | (0.000360) | (0.000995) |
| Ethnic minority | 0.0480* | 0.0199* | -0.0679* | 0.0480* | 0.0269* | -0.0749* |
| | (0.0283) | (0.0121) | (0.0402) | (0.0251) | (0.0148) | (0.0395) |
| Access to electricity | -0.277*** | -0.115*** | 0.392*** | -0.207*** | -0.116*** | 0.323*** |
| | (0.0795) | (0.0342) | (0.112) | (0.0732) | (0.0404) | (0.111) |
| Access to public water supply | 0.0156 | 0.00646 | -0.0220 | 0.0148 | 0.00831 | -0.0231 |
| | (0.0305) | (0.0126) | (0.0431) | (0.0278) | (0.0156) | (0.0433) |
| Access to sanitation | -0.0135 | -0.00560 | 0.0191 | -0.000229 | -0.000129 | 0.000358 |
| | (0.0389) | (0.0162) | (0.0551) | (0.0336) | (0.0188) | (0.0524) |
| Access to public waste disposal | 0.0405 | 0.0168 | -0.0572 | 0.0255 | 0.0143 | -0.0398 |
| | (0.0777) | (0.0321) | (0.110) | (0.0705) | (0.0393) | (0.110) |
| Access to fixed line telephone | 0.0376 | 0.0156 | -0.0532 | 0.0396 | 0.0222 | -0.0619 |
| | (0.0482) | (0.0200) | (0.0681) | (0.0455) | (0.0258) | (0.0712) |
| Access to internet | -0.0998 | -0.0414 | 0.141 | -0.0205 | -0.0115 | 0.0319 |
| | (0.256) | (0.106) | (0.362) | (0.226) | (0.126) | (0.352) |
| Travel distance to district town | 0.000817 | 0.000339 | -0.00116 | 0.000903 | 0.000507 | -0.00141 |
| | (0.000851) | (0.000351) | (0.00120) | (0.000788) | (0.000439) | (0.00122) |
| Mountain | -0.0702*** | -0.0291*** | 0.0994*** | -0.0637*** | -0.0358*** | 0.0994*** |
| | (0.0235) | (0.00994) | (0.0331) | (0.0208) | (0.0116) | (0.0316) |
| Slope | 0.0411 | 0.0170 | -0.0581 | 0.0208 | 0.0117 | -0.0325 |
| | (0.0288) | (0.0121) | (0.0407) | (0.0252) | (0.0142) | (0.0393) |
| Valley | -0.0240 | -0.00995 | 0.0339 | -0.0199 | -0.0112 | 0.0311 |
| | (0.0365) | (0.0151) | (0.0516) | (0.0330) | (0.0185) | (0.0515) |
| River | 0.0506* | 0.0210* | -0.0716* | 0.0454* | 0.0255 | -0.0709 |
| | (0.0282) | (0.0121) | (0.0401) | (0.0276) | (0.0160) | (0.0432) |
| Lake | 0.00493 | 0.00204 | -0.00697 | 0.00434 | 0.00244 | -0.00677 |
| | (0.0271) | (0.0112) | (0.0383) | (0.0232) | (0.0130) | (0.0362) |
| Coast | -0.0451 | -0.0187 | 0.0638 | -0.0431 | -0.0242 | 0.0673 |
| | (0.0456) | (0.0190) | (0.0645) | (0.0409) | (0.0227) | (0.0634) |
| Ha Tinh | 0.0351 | 0.0146 | -0.0497 | 0.00822 | 0.00461 | -0.0128 |
| | (0.0361) | (0.0152) | (0.0512) | (0.0299) | (0.0169) | (0.0467) |
| Thua Thien-Hue | 0.0718* | 0.0298 | -0.102* | 0.0509 | 0.0286 | -0.0795 |
| | (0.0422) | (0.0184) | (0.0603) | (0.0384) | (0.0220) | (0.0601) |

Notes: Model 1 corresponds to regressions with Income and Mean village income. Model 2 corresponds to regressions with Income and Poor (including their interaction). All explanatory variables are exogenous. Significance levels: * 10% ** 5%, *** 1%. Number of observations: 1197.

Table 6: Marginal effects, the case of *SWB5*, Thailand.

| | | Model 1 | | | Model 2 | |
|---|---|---|---|---|---|---|
| Variable | *P(SWB5=1)* | *P(SWB5=2)* | *P(SWB5=3)* | *P(SWB5=1)* | *P(SWB5=2)* | *P(SWB5=3)* |
| Income | -0.00451*** | -0.00148*** | 0.00599*** | -0.0103*** | -0.00531*** | 0.0156*** |
| | (0.00142) | (0.000496) | (0.00189) | (0.00222) | (0.00161) | (0.00374) |
| Mean village income | -0.000327 | -0.000108 | 0.000435 | -- | -- | -- |
| | (0.00106) | (0.000348) | (0.00141) | | | |
| Poor | -- | -- | -- | 0.170*** | 0.0877*** | -0.258*** |
| | | | | (0.0293) | (0.0223) | (0.0497) |
| Subjective wealth, wrt village | -0.0253 | -0.00831 | 0.0336 | -0.0149 | -0.00770 | 0.0226 |
| | (0.0166) | (0.00552) | (0.0221) | (0.0141) | (0.00727) | (0.0214) |
| Subjective wealth, wrt country | -0.0335** | -0.0110** | 0.0446** | -0.0273** | -0.0141** | 0.0414** |
| | (0.0157) | (0.00512) | (0.0208) | (0.0134) | (0.00684) | (0.0201) |
| Drought | -0.0397 | -0.0131 | 0.0528 | -0.0270 | -0.0139 | 0.0409 |
| | (0.0253) | (0.00806) | (0.0333) | (0.0217) | (0.0109) | (0.0325) |
| Flooding | -0.0303 | -0.00994 | 0.0402 | -0.0224 | -0.0115 | 0.0339 |
| | (0.0325) | (0.0105) | (0.0430) | (0.0277) | (0.0143) | (0.0419) |
| Storm, landslide | -0.0824 | -0.0271 | 0.109 | -0.0812 | -0.0419 | 0.123 |
| | (0.121) | (0.0399) | (0.161) | (0.0983) | (0.0508) | (0.149) |
| Pests or livestock disease | -0.132** | -0.0432** | 0.175** | -0.109** | -0.0563** | 0.166** |
| | (0.0550) | (0.0191) | (0.0736) | (0.0465) | (0.0249) | (0.0705) |
| Collapse of business | 0.0661 | 0.0217 | -0.0878 | 0.0612 | 0.0316 | -0.0928 |
| | (0.0850) | (0.0281) | (0.113) | (0.0709) | (0.0371) | (0.108) |
| Consumption reduction | 0.0697*** | 0.0229*** | -0.0926*** | 0.0618*** | 0.0319*** | -0.0937*** |
| | (0.0214) | (0.00733) | (0.0284) | (0.0186) | (0.00985) | (0.0278) |
| Risk avoidance | 0.0202 | 0.00662 | -0.0268 | 0.0127 | 0.00656 | -0.0193 |
| | (0.0208) | (0.00687) | (0.0277) | (0.0183) | (0.00934) | (0.0276) |
| Risk acceptence | 0.0251 | 0.00825 | -0.0334 | 0.0274 | 0.0141 | -0.0415 |
| | (0.0301) | (0.00998) | (0.0401) | (0.0256) | (0.0133) | (0.0388) |
| Good health | -0.0145 | -0.00477 | 0.0193 | -0.00998 | -0.00515 | 0.0151 |
| | (0.0318) | (0.0104) | (0.0422) | (0.0277) | (0.0142) | (0.0419) |
| Suffering from serious disease | -0.0383 | -0.0126 | 0.0509 | -0.0284 | -0.0146 | 0.0431 |
| | (0.0263) | (0.00859) | (0.0348) | (0.0227) | (0.0116) | (0.0342) |
| Average age | -0.00125 | -0.000411 | 0.00166 | -0.00122 | -0.000631 | 0.00186 |
| | (0.000984) | (0.000326) | (0.00131) | (0.000833) | (0.000433) | (0.00126) |
| Ethnic minority | 0.00963 | 0.00317 | -0.0128 | 0.00209 | 0.00108 | -0.00317 |
| | (0.0517) | (0.0170) | (0.0686) | (0.0453) | (0.0233) | (0.0686) |
| Access to electricity | 0.333 | 0.109 | -0.443 | 0.257 | 0.133 | -0.390 |
| | (0.289) | (0.0960) | (0.384) | (0.244) | (0.126) | (0.369) |
| Access to public water supply | 0.0632 | 0.0208 | -0.0840 | 0.0587* | 0.0302* | -0.0889* |
| | (0.0396) | (0.0133) | (0.0527) | (0.0335) | (0.0173) | (0.0504) |
| Access to sanitation | -0.0397 | -0.0130 | 0.0527 | -0.0403 | -0.0208 | 0.0610 |
| | (0.0491) | (0.0164) | (0.0655) | (0.0416) | (0.0217) | (0.0632) |
| Access to public waste disposal | -0.0213 | -0.00699 | 0.0282 | -0.0210 | -0.0108 | 0.0319 |
| | (0.0300) | (0.00986) | (0.0399) | (0.0262) | (0.0135) | (0.0397) |
| Access to fixed line telephone | 0.00970 | 0.00319 | -0.0129 | 0.00952 | 0.00490 | -0.0144 |
| | (0.0413) | (0.0135) | (0.0548) | (0.0359) | (0.0184) | (0.0544) |
| Access to internet | 0.0734 | 0.0241 | -0.0975 | 0.0540 | 0.0278 | -0.0818 |
| | (0.0677) | (0.0225) | (0.0901) | (0.0680) | (0.0348) | (0.103) |
| Travel distance to district town | -0.000321 | -0.000106 | 0.000427 | -0.000351 | -0.000181 | 0.000532 |
| | (0.00131) | (0.000431) | (0.00174) | (0.00113) | (0.000582) | (0.00171) |
| Mountain | 0.203*** | 0.0668*** | -0.270*** | 0.157*** | 0.0809*** | -0.238*** |
| | (0.0550) | (0.0195) | (0.0734) | (0.0512) | (0.0268) | (0.0764) |
| Slope | -0.0169 | -0.00555 | 0.0225 | -0.0114 | -0.00587 | 0.0173 |
| | (0.0452) | (0.0149) | (0.0601) | (0.0377) | (0.0194) | (0.0571) |
| Valley | 0.132*** | 0.0434*** | -0.176*** | 0.0946*** | 0.0487*** | -0.143*** |
| | (0.0264) | (0.0109) | (0.0366) | (0.0232) | (0.0130) | (0.0349) |
| River | -0.0298 | -0.00978 | 0.0396 | -0.0218 | -0.0112 | 0.0330 |
| | (0.0306) | (0.0101) | (0.0407) | (0.0271) | (0.0140) | (0.0410) |
| Buriram | 0.0766** | 0.0252** | -0.102** | 0.0699** | 0.0360** | -0.106** |
| | (0.0348) | (0.0115) | (0.0460) | (0.0302) | (0.0162) | (0.0459) |
| Ubon Ratchathani | -0.0203 | -0.00666 | 0.0269 | -0.0164 | -0.00843 | 0.0248 |
| | (0.0352) | (0.0115) | (0.0467) | (0.0300) | (0.0153) | (0.0453) |

Notes: Model 1 corresponds to regressions with Income and Mean village income. Model 2 corresponds to regressions with Income and Poor (including their interaction). All explanatory variables are exogenous. Significance levels: * 10% ** 5%, *** 1%. Number of observations: 1389.

## 6. Conclusion

This paper aims to analyze the households' subjective well-being using the data on rural areas of Vietnam and Thailand. Our findings show that income is one of the key determinants of the households' subjective well-being. Moreover, households are sensitive to relative poverty. This finding is not surprising for the case of developing countries, and should be interpreted as an income comparison in the households' preferences. Earning an income lower than the mean village level makes households feel worse off compared to the previous year or 5 previous years. These results constitute a common point for both countries.

For the rest, there is a significant difference in other factors' effects such as geographic conditions, wealth effect, environmental risks, etc. In particular, we observe that Thai households are concerned with wealth comparison while Vietnamese are not. This implies that for the households in 3 rural provinces in Thailand, their wealth is also the subject to social comparison. In addition, this comparison may be upward, i.e. households compare their wealth to a wealth level higher than theirs.

Environmental risks differently affect the households' well-being in both countries. However, we observe a similarity in the effect of the risks' monetary consequences. If these events in the past reduce the households' consumption, this consumption reduction negatively affects the households' subjective well-being. Moreover, the households' attitude towards risks acceptance affect their subjective well-being in the Vietnamese case. We find that households who are more ready to accept risks (lower risk aversion) feel better off in the present compared to the previous year or 5 previous years.

This paper provides some policy implications about the households' happiness, in particular for people in poor and rural areas with a high poverty rate, harsh living conditions and often suffering environmental risks. In particular, the income's asymmetric effect and the relativeness regarding wealth and poverty would urge policy makers in Vietnam and Thailand to implement measures in favor of poverty and inequality reduction.

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## Appendix


Figure A1: Area of survey. Source: Hardeweg (2009) based on ESRI World Map.

Table A1: Definition of variables

| Variable | Definition | Type |
|---|---|---|
| $\boldsymbol{SWB}$ | Household subjective well-being, compared to previous year (=1 if much worse/worse off, 2 same as, 3 if much better/better off) | Discrete |
| $\boldsymbol{SWB5}$ | Household subjective well-being, compared to previous 5 year (=1 if much worse/worse off, 2 same as, 3 if much better/better off) | Discrete |
| Income | Household income, in thousands dollars, PPP | Continuous |
| Mean village income | Mean household income, computed at the village level | Continuous |
| Poor | = 1 if household income lower than the mean village income | Dummy |
| Subjective wealth, wrt village | Subjective wealth, compared to other village residents (=1 if much worse/worse off, 2 same as, 3 if much better/better off) | Discrete |
| Subjective wealth, wrt country | Subjective wealth, compared to other country residents (=1 if much worse/worse off, 2 same as, 3 if much better/better off) | Discrete |
| *Environmental and economic risks* | | |
| Drought | = 1 if the event occurs between 05/2008 and 04/2010 | Dummy |
| Flooding of agricultural land | = 1 if the event occurs between 05/2008 and 04/2010 | Dummy |
| Heavy ice rain | = 1 if the event occurs between 05/2008 and 04/2010 (only Vietnam) | Dummy |
| Storm, landslide | = 1 if the event occurs between 05/2008 and 04/2010 | Dummy |
| Pests or livestock disease | = 1 if the event occurs between 05/2008 and 04/2010 | Dummy |
| Collapse of business | = 1 if the event occurs between 05/2008 and 04/2010 | Dummy |
| Consumption reduction | =1 if households reduce their expenditures because of the environmental and economic events between 05/2008 and 04/2010 | Dummy |
| Risk avoidance | = 1 if self-assessment of general risk attitude = 0, 1, 2 or 3 | Dummy |
| Risk acceptance | = 1 if self-assessment of risk attitude = 8,9,10 | Dummy |
| Risk neutrality | = 1 if self-assessment of general risk attitude = 4,5,6,7 | Dummy |
| Health good | = 1 if good health | Dummy |
| Suffering from serious disease | = 1 if serious disease | Dummy |
| Average age | Average age of household members | Continuous |
| Ethnic minority | Belonging to an ethnic minority (=1 if belonging to an ethnic minority, 0 if belonging to Kinh majority group for Vietnam case, and if belonging to Thai ethnic for Thailand case) | Dummy |
| *Access to facilities* | | |
| Access to electricity | Percentage of village households having access to electricity | Continuous |
| Access to public water supply | Percentage of village households having access to public water supply | Continuous |
| Access to sanitation | Percentage of village households having access to sanitation | Continuous |
| Access to public waste disposal | Percentage of village households having access to public waste disposal | Continuous |
| Access to fixed line telephone | Percentage of village households having a fixed line telephone | Continuous |
| Access to internet | Percentage of village households having access to internet | Continuous |
| *Village characteristics* | | |
| Travel distance to district town | Travel distance between village and district town | Continuous |
| Mountain | =1 if located on a mountain, 0 otherwise | Dummy |
| Slope | =1 if located on slope, 0 otherwise | Dummy |
| Valley | =1 if located in a valley, 0 otherwise | Dummy |
| River | =1 if located near a river, 0 otherwise | Dummy |
| Lake | =1 if located near a lake, 0 otherwise (only Vietnam) | Dummy |
| Coast | =1 if located near the coast, 0 otherwise (only Vietnam) | Dummy |
| *Provinces* | | |
| Ha Tinh | =1 if belonging to the province, 0 otherwise (Vietnam) | Dummy |
| Thua Thien – Hue | =1 if belonging to the province, 0 otherwise (Vietnam) | Dummy |
| Dak Lak | =1 if belonging to the province, 0 otherwise (Vietnam) | Dummy |
| Buriram | =1 if belonging to the province, 0 otherwise (Thailand) | Dummy |
| Ubon Ratchathani | =1 if belonging to the province, 0 otherwise (Thailand) | Dummy |
| Nakhon Phanom | =1 if belonging to the province, 0 otherwise (Thailand) | Dummy |

Tableau A2: Descriptive statistics, Vietnam

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| ***SWB*** | 2.030 | 0.768 | 1 | 3 |
| ***SWB5*** | 2.340 | 0.820 | 1 | 3 |
| Income | 5.935 | 5.685 | 0.047 | 45.457 |
| Poor | 0.630 | 0.483 | 0 | 1 |
| Mean village income | 5.921 | 2.224 | 1.905 | 14.713 |
| Subjective wealth, wrt village | 1.775 | 0.685 | 1 | 3 |
| Subjective wealth, wrt country | 1.460 | 0.622 | 1 | 3 |
| Drought | 0.074 | 0.262 | 0 | 1 |
| Flooding of land | 0.093 | 0.290 | 0 | 1 |
| Heavy ice rain | 0.040 | 0.196 | 0 | 1 |
| Storm, landslide | 0.102 | 0.302 | 0 | 1 |
| Pests or livestock disease | 0.130 | 0.336 | 0 | 1 |
| Collapse of business | 0.015 | 0.121 | 0 | 1 |
| Average age | 32.661 | 13.575 | 11.6 | 90 |
| Consumption reduction | 0.794 | 0.404 | 0 | 1 |
| Risk avoidance | 0.460 | 0.498 | 0 | 1 |
| Risk neutrality | 0.450 | 0.497 | 0 | 1 |
| Risk acceptance | .0893 | 0.285 | 0 | 1 |
| Health good | 0.731 | 0.443 | 0 | 1 |
| Serious disease | 0.371 | 0.483 | 0 | 1 |
| Ethnic minority | 0.163 | 0.643 | 0 | 1 |
| Access to electricity | 98.06 | 8.54 | 0 | 100 |
| Access to public water supply | 15.818 | 32.633 | 0 | 100 |
| Access to sanitation | 45.174 | 37.153 | 0 | 100 |
| Access to public waste disposal | 4.09 | 15.96 | 0 | 100 |
| Access to fixed line telephone | 85.05 | 26.62 | 30 | 100 |
| Access to internet | 1.873 | 3.922 | 0 | 100 |
| Travel distance to district town | 13.04 | 10.08 | 0.7 | 70 |
| Slope | 0.293 | 0.455 | 0 | 1 |
| Mountain | 0.475 | 0.499 | 0 | 1 |
| Valley | 0.088 | 0.283 | 0 | 1 |
| River | 0.185 | 0.388 | 0 | 1 |
| Lake | 0.169 | 0.375 | 0 | 1 |
| Coast | 0.051 | 0.220 | 0 | 1 |
| Ha Tinh province | 0.391 | 0.488 | 0 | 1 |
| Thua Thien – Hue province | 0.191 | 0.393 | 0 | 1 |
| Dak Lak province | 0.418 | 0.493 | 0 | 1 |

Note: number of observations 1200

Tableau A3: Descriptive statistics,Thailand

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| $\boldsymbol{SWB}$ | 2.192 | 0.759 | 1 | 3 |
| $\boldsymbol{SWB5}$ | 2.304 | 0.823 | 1 | 3 |
| Income | 8.304 | 7.770 | 0.035 | 46.579 |
| Poor | 0.625 | 0.484 | 0 | 1 |
| Mean village income | 8.313 | 3.145 | 2.014 | 20.428 |
| Subjective wealth, wrt village | 1.925 | 0.580 | 1 | 3 |
| Subjective wealth, wrt country | 1.564 | 0.641 | 1 | 3 |
| Drought | 0.219 | 0.413 | 0 | 1 |
| Flooding of land | 0.087 | 0.282 | 0 | 1 |
| Heavy ice rain | 0.003 | 0.059 | 0 | 1 |
| Storm, landslide | 0.005 | 0.070 | 0 | 1 |
| Pests or livestock disease | 0.041 | 0.200 | 0 | 1 |
| Collapse of business | 0.014 | 0.116 | 0 | 1 |
| Average age | 35.255 | 10.208 | 15.333 | 85 |
| Consumption reduction | 0.339 | 0.473 | 0 | 1 |
| Risk avoidance | 0.286 | 0.452 | 0 | 1 |
| Risk neutrality | 0.590 | 0.491 | 0 | 1 |
| Risk acceptance | 0.124 | 0.329 | 0 | 1 |
| Health good | 0.865 | 0.342 | 0 | 1 |
| Serious disease | 0.234 | 0.423 | 0 | 1 |
| Ethnic minority | 0.057 | 0.232 | 0 | 1 |
| Access to electricity | 98.789 | 4.130 | 70 | 100 |
| Access to public water supply | 84.445 | 29.255 | 0 | 100 |
| Access to sanitation | 83.555 | 29.070 | 0 | 100 |
| Access to public waste disposal | 15.320 | 35.167 | 0 | 100 |
| Access to fixed line telephone | 34.574 | 45.417 | 0 | 100 |
| Access to internet | 2.794 | 10.116 | 0 | 100 |
| Travel distance to district town | 13.379 | 8.424 | 0.1 | 46 |
| Mountain | 0.008 | 0.092 | 0 | 1 |
| Slope | 0.049 | 0.217 | 0 | 1 |
| Valley | 0.004 | 0.065 | 0 | 1 |
| River | 0.182 | 0.386 | 0 | 1 |
| Buriram province | 0.396 | 0.489 | 0 | 1 |
| Ubon Ratchathani province | 0.404 | 0.491 | 0 | 1 |
| Nakhon Phanom province | 0.198 | 0.399 | 0 | 1 |

Note: number of observations 1389

Table A4: Estimation results for *SWB*.

| | Vietnam | | | | Thailand | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (1) | | (2) | |
| Variable | Coef. | Std.Err. | Coef. | Std.Err. | Coef. | Std.Err. | Coef. | Std.Err. |
| Income | 0.0214*** | 0.0070 | 0.0059 | 0.0086 | 0.0133*** | 0.0046 | 0.0028 | 0.0061 |
| Mean village income | -0.0028 | 0.0153 | -- | -- | 0.0029 | 0.0040 | -- | -- |
| Poor | -- | -- | -0.4066*** | 0.1202 | -- | -- | -0.3633*** | 0.1270 |
| Poor=1#Income | -- | -- | 0.0650*** | 0.0197 | -- | -- | 0.0441*** | 0.0153 |
| Subjective wealth, wrt village | -0.0412 | 0.0598 | -0.0625 | 0.0599 | -0.0065 | 0.0558 | -0.0204 | 0.0559 |
| Subjective wealth, wrt country | 0.0923 | 0.0712 | 0.0798 | 0.0720 | 0.1337** | 0.0540 | 0.1314** | 0.0539 |
| Drought | 0.2260* | 0.1178 | 0.2438** | 0.1176 | 0.1986** | 0.0812 | 0.1808** | 0.0813 |
| Flooding | 0.3229*** | 0.1117 | 0.3066*** | 0.1139 | -0.0107 | 0.1090 | -0.0198 | 0.1096 |
| Heavy ice rain | 0.2938* | 0.1647 | 0.2690 | 0.1657 | -- | -- | -- | -- |
| Storm, landslide | -0.1717 | 0.1252 | -0.1457 | 0.1272 | 0.3821 | 0.3466 | 0.3878 | 0.3572 |
| Pests or livestock disease | 0.1552* | 0.0909 | 0.1617* | 0.0909 | 0.2019 | 0.1539 | 0.1911 | 0.1522 |
| Collapse of business | 0.1653 | 0.3065 | 0.1178 | 0.2918 | -0.0946 | 0.2625 | -0.1039 | 0.2642 |
| Consumption reduction | -0.2666*** | 0.0797 | -0.2559*** | 0.0802 | -0.1542** | 0.0724 | -0.1568** | 0.0730 |
| Risk avoidance | -0.3112*** | 0.0673 | -0.2990*** | 0.0672 | -0.0814 | 0.0678 | -0.0724 | 0.0691 |
| Risk acceptance | 0.5217*** | 0.1171 | 0.5401*** | 0.1189 | 0.0671 | 0.0915 | 0.0575 | 0.0909 |
| Good health | -0.0387 | 0.0849 | -0.0441 | 0.0843 | 0.0997 | 0.0992 | 0.0924 | 0.1006 |
| Serious disease | -0.1361* | 0.0736 | -0.1418* | 0.0738 | 0.0828 | 0.0904 | 0.0709 | 0.0916 |
| Average age | 0.0017 | 0.0025 | 0.0018 | 0.0025 | 0.0042 | 0.0032 | 0.0047 | 0.0033 |
| Ethnic minority | 0.1118 | 0.1080 | 0.1018 | 0.1083 | 0.1343 | 0.1699 | 0.1469 | 0.1720 |
| Access to electricity | 0.7838*** | 0.2290 | 0.7356*** | 0.2308 | -1.0685 | 0.6582 | -1.0065 | 0.6736 |
| Access to public water supply | -0.0165 | 0.0949 | -0.0333 | 0.0962 | -0.1574* | 0.0928 | -0.1699* | 0.0914 |
| Access to sanitation | 0.0757 | 0.1473 | 0.0490 | 0.1482 | 0.0477 | 0.1439 | 0.0608 | 0.1422 |
| Access to public waste disposal | -0.2667 | 0.2408 | -0.2520 | 0.2410 | 0.0644 | 0.0918 | 0.0678 | 0.0941 |
| Access to fixed line telephone | -0.0794 | 0.1655 | -0.0803 | 0.1712 | -0.0472 | 0.0980 | -0.0509 | 0.1000 |
| Access to internet | 1.0775 | 0.9890 | 0.9822 | 0.9802 | 0.1837 | 0.2991 | 0.2205 | 0.3340 |
| Travel distance to district town | 0.0033 | 0.0036 | 0.0028 | 0.0036 | 0.0008 | 0.0037 | 0.0010 | 0.0037 |
| Mountain | 0.1960** | 0.0800 | 0.1969** | 0.0809 | -0.7601*** | 0.1031 | 0.7356*** | 0.1125 |
| Slope | -0.0941 | 0.1094 | -0.0657 | 0.1097 | -0.0960 | 0.1353 | -0.0996 | 0.1367 |
| Valley | 0.2020 | 0.1476 | 0.1940 | 0.1514 | -0.3595*** | 0.0881 | 0.3167*** | 0.0864 |
| River | -0.0264 | 0.1179 | -0.0233 | 0.1215 | 0.1567* | 0.0828 | 0.1467* | 0.0852 |
| Lake | -0.0162 | 0.0975 | -0.0224 | 0.0961 | -- | -- | -- | -- |
| Coast | -0.0810 | 0.1270 | -0.0771 | 0.1249 | -- | -- | -- | -- |
| Ha Tinh | 0.4156*** | 0.1210 | 0.4529*** | 0.1260 | -- | -- | -- | -- |
| Thua Thien-Hue | 0.1818 | 0.1521 | 0.2145 | 0.1497 | -- | -- | -- | -- |
| Buriram | -- | -- | -- | -- | -0.1584 | 0.1214 | -0.1660 | 0.1212 |
| Ubon Ratchathani | -- | -- | -- | -- | 0.1990* | 0.1122 | 0.1974* | 0.1135 |
| c1 | 0.3351 | 0.3391 | 0.0392 | 0.3500 | -1.3583** | 0.6844 | -1.5505** | 0.7042 |
| c2 | 1. 5164*** | 0.3417 | 1.2273*** | 0.3519 | -0.2730 | 0.6873 | -0.4598 | 0.7065 |
| Log-likelihood | -1217.195 | | -1212. 081 | | -1439.129 | | -1438.975 | |
| Number of observations | 1200 | | 1200 | | 1389 | | 1389 | |

Notes: Model (1) corresponds to regressions with Income and Mean village income. Model (2) corresponds to regressions with Poor. All explanatory variables are exogenous. Significance levels: *10%, ** 5%, *** 1%.

Table A5: Estimation results for *SWB5*.

| | Vietnam | | | | Thailand | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | | (2) | | (1) | | (2) | |
| Variable | Coef. | Std.Err. | Coef. | Std.Err. | Coef. | Std.Err. | Coef. | Std.Err. |
| Income | 0.0410*** | 0.0092 | 0.0048 | 0.0096 | 0.0151*** | 0.0048 | -0.0057 | 0.0063 |
| Mean village income | -0.0353** | 0.0179 | | | 0.0011 | 0.0036 | | |
| Poor | | | -0.6852*** | 0.1519 | | | -0.6730*** | 0.1357 |
| Poor=1#Income | | | 0.0747*** | 0.0246 | | | 0.0743*** | 0.0174 |
| Subjective wealth, wrt village | 0.0074 | 0.0640 | -0.0238 | 0.0645 | 0.0847 | 0.0557 | 0.0591 | 0.0557 |
| Subjective wealth, wrt country | 0.0257 | 0.0744 | -0.0053 | 0.0754 | 0.1122** | 0.0522 | 0.1081** | 0.0522 |
| Drought | 0.0881 | 0.1353 | 0.1184 | 0.1366 | 0.1330 | 0.0838 | 0.1067 | 0.0847 |
| Flooding | 0.4995*** | 0.1309 | 0.4907*** | 0.1307 | 0.1013 | 0.1083 | 0.0884 | 0.1093 |
| Heavy ice rain | 0.5586*** | 0.2052 | 0.5179** | 0.2125 | | | | |
| Storm, landslide | 0.0337 | 0.1269 | 0.0828 | 0.1267 | 0.2758 | 0.4062 | 0.3212 | 0.3885 |
| Pests or livestock disease | 0.2090* | 0.1111 | 0.2240** | 0.1106 | 0.4400** | 0.1854 | 0.4320** | 0.1839 |
| Collapse of business | 0.2034 | 0.3229 | 0.1327 | 0.3004 | -0.2212 | 0.2845 | -0.2421 | 0.2813 |
| Consumption reduction | -0.1742* | 0.0942 | -0.1602* | 0.0949 | -0.2333*** | 0.0714 | -0.2445*** | 0.0721 |
| Risk avoidance | -0.4310*** | 0.0772 | -0.4167*** | 0.0757 | -0.0674 | 0.0697 | -0.0503 | 0.0719 |
| Risk acceptance | 0.3596** | 0.1674 | 0.3911** | 0.1685 | -0.0841 | 0.1010 | -0.1082 | 0.1013 |
| Good health | 0.0013 | 0.1086 | -0.0009 | 0.1099 | 0.0485 | 0.1062 | 0.0395 | 0.1092 |
| Serious disease | -0.0150 | 0.0942 | -0.0123 | 0.0938 | 0.1282 | 0.0877 | 0.1124 | 0.0890 |
| Average age | 0.0017 | 0.0026 | 0.0019 | 0.0026 | 0.0042 | 0.0033 | 0.0048 | 0.0033 |
| Ethnic minority | -0.1731* | 0.1025 | -0.1976* | 0.1045 | -0.0322 | 0.1729 | -0.0083 | 0.1790 |
| Access to electricity | 0.9986*** | 0.2845 | 0.8513*** | 0.2910 | -1.1150 | 0.9680 | -1.0177 | 0.9635 |
| Access to public water supply | -0.0562 | 0.1100 | -0.0610 | 0.1143 | -0.2116 | 0.1329 | -0.2319* | 0.1317 |
| Access to sanitation | 0.0487 | 0.1405 | 0.0009 | 0.1383 | 0.1328 | 0.1649 | 0.1593 | 0.1650 |
| Access to public waste disposal | -0.1459 | 0.2797 | -0.1051 | 0.2893 | 0.0711 | 0.1004 | 0.0831 | 0.1035 |
| Access to fixed line telephone | -0.1357 | 0.1736 | -0.1632 | 0.1878 | -0.0325 | 0.1381 | -0.0376 | 0.1418 |
| Access to internet | 0.3598 | 0.9217 | 0.0843 | 0.9291 | -0.2457 | 0.2270 | -0.2134 | 0.2675 |
| Travel distance to district town | -0.0029 | 0.0031 | -0.0037 | 0.0032 | 0.0011 | 0.0044 | 0.0014 | 0.0045 |
| Mountain | 0.2533*** | 0.0842 | 0.2624*** | 0.0829 | -0.6804*** | 0.1852 | -0.6210*** | 0.1998 |
| Slope | -0.1481 | 0.1037 | -0.0858 | 0.1036 | 0.0566 | 0.1513 | 0.0451 | 0.1489 |
| Valley | 0.0865 | 0.1316 | 0.0821 | 0.1359 | -0.4424*** | 0.0930 | -0.3739*** | 0.0919 |
| River | -0.1825* | 0.1020 | -0.1869 | 0.1138 | 0.0996 | 0.1025 | 0.0862 | 0.1070 |
| Lake | -0.0178 | 0.0977 | -0.0179 | 0.0956 | | | | |
| Coast | 0.1627 | 0.1644 | 0.1776 | 0.1667 | | | | |
| Ha Tinh | -0.1267 | 0.1305 | -0.0339 | 0.1233 | | | | |
| Thua Thien-Hue | -0.2591* | 0.1539 | -0.2098 | 0.1587 | | | | |
| Buriram | | | | | -0.2562** | 0.1158 | -0.2764** | 0.1202 |
| Ubon Ratchathani | | | | | 0.0678 | 0.1176 | 0.0647 | 0.1179 |
| c1 | -0.1525 | 0.3956 | -0.6600 | 0.4375 | -1.3458 | 0.9959 | -1.7156* | 0.9914 |
| c2 | 0.5175 | 0.3916 | 0.0167 | 0.4310 | -0.6836 | 0.9964 | -1.0440 | 0.9912 |
| Log-likelihood | -1092.444 | | -1084.094 | | -1366.100 | | -1351.321 | |
| Number of observations | 1197 | | 1197 | | 1389 | | 1389 | |

Notes: Model (1) corresponds to regressions with Income and Mean village income. Model (2) corresponds to regressions with Poor. All explanatory variables are exogenous. Significance levels: *10%, ** 5%, *** 1%.