

What about the Women?

Female Headship, Poverty and Vulnerability in Thailand and Vietnam

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Abstract

This paper investigates whether different types of female headed households in Thailand and Vietnam are worse off compared to households headed by men in terms of (i) consumption, (ii) the likelihood to experience a shock, (iii) shock severity, (iv) consumption smoothing, as well as (v) vulnerability to poverty and (vi) perceived vulnerability to downside risk. Using a unique panel dataset of over 4000 rural households from both countries, we find that female headed households are somewhat better off in terms of current consumption in both countries. In addition, there is very little evidence that female-headed households are more prone to shocks, less able to smooth their consumption or more vulnerable than male-headed households. The results indicate that differentiation by subgroups of headship remains important, since especially widows and singles are generally worse off than female heads with a migrated spouse. We interpret our results as a first step towards a more complete picture of the vulnerability of female headed households in the developing world.

Keywords. Poverty, Gender, Vulnerability to Poverty

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1. Introduction

Since the 1990s the poverty status of women is subject to increased attention of economists and policy makers. In 1995 the issue was put on top of the international development agenda at the Fourth World Conference on Women taking place in Beijing in 1995 (e.g. World Bank, 2001a and 2007). While there is a large literature documenting the disadvantage of women in many aspects of well-being, including education, health, and survival (e.g. World Bank 2001a, Klasen and Wink, 2003), the claim of the feminization of income poverty has been harder to substantiate empirically. The literature has particularly focused on the fate of female headed households where evidence from the industrialized world appeared to point to higher poverty among this group of households. The question then arose how female-headed households fare in developing countries.

Female headed households in developing countries deserve special attention since they are typically disadvantaged regarding the access to land, labor, credit and insurance markets, discriminated against by cultural norms and suffering from, among others, high dependency burdens, economic immobility and the “double day burden” of their heads. Evidence regarding the poverty status of female headed households in comparison to households headed by men is, however, ambiguous (e.g. Marcoux, 1999; Chant, 1993; Rosenhouse, 1989). The first purpose of our study is therefore to clarify the picture for rural areas in Thailand and Vietnam where poverty headcounts have been falling dramatically over the last two decades (World Bank, 2008).

But in order to assess the situation of female headed households in comparison to male headed ones a static poverty assessment is not sufficient (Buvinic and Gupta, 1997). Even if female-headed households are not poorer, they may be more vulnerable to poverty as they face higher risks and/or have fewer options for ex ante and ex post coping strategies. Therefore, we include the vulnerability of households as another dimension of wellbeing in our analysis. Assertions such as “social relations of gender predict greater vulnerability among women” (Moghadam, 1997) are common in gender related poverty research (see also, for instance, Chant, 2008; Moghadam, 2005; World Bank, 2001a; Bibars, 2001). Although it is commonly stated that female headed households are more vulnerable than households headed by men in terms of shocks and downside risks, little is known about this issue empirically. There are relatively few empirical studies on vulnerability and almost none of them focuses on this particular point.¹ Hence, the second purpose of this paper is to shed more light on the vulnerability of female headed households by empirically examining gender related correlates of shock exposure, consumption smoothing, threats

¹ An exception is, for example, Glewwe and Hall (1998).

of poverty etc. We scrutinize this issue using a unique panel covering some 4400 rural household in Thailand and Vietnam which provides data on, inter alia, shocks experienced in the past and perceived future risks. In our analysis we pay special attention to the situation of certain types of female headed households. More precisely, we differentiate between de jure and de facto female headed households, as well as between households led by widows, single women and women whose husband is absent. This study is to our knowledge the first one that provides a thorough empirical assessment of the relative shock exposure and vulnerability of female headed households.

The paper is structured as follows: Section 2 provides an overview about literature related to female headed households and their wellbeing compared to male headed households. In section 3 we focus on concepts and measures of vulnerability issues and discuss why female headed households may be particularly vulnerable. Section 4 briefly describes gender differences in Thailand and Vietnam before we start our empirical analysis in section 5. In the last section we summarize our results and draw conclusions.

2. Female headed households and poverty

2.1 Economic disadvantages faced by female headed households

At the latest from the 1990s onwards the “feminization of poverty” has been heavily discussed among economists (Chant, 2008). The multiple reasons for an explicitly gender related research are, among others, the observed increase of female headed households (e.g. Budowski et al., 2002; Moghadam, 1997), as well as the belief that especially these households suffer from the burden of poverty and vulnerability (e.g. Buvinic and Gupta, 1997).

The literature about females’ disadvantages in developing countries can broadly be grouped into two strands: one which focuses on gender related differences, i.e. on differences between men and women, in general, and another one which concentrates on the comparison of male and female headed households. Although in this paper we are concerned with the latter analysis we also partly draw on literature of the former since it provides theoretical reasons and empirical proof of (non-)discrimination relevant for our investigation.²

² Research regarding gender differences which is not presented here includes, for example, work on discriminating intra-household allocation (e.g. Burgess and Zhang, 2001) or women’s lack of voice in the political context (e.g. King et al., 2007)

Among disadvantages for women in developing countries the lack of access to markets stand out. First, in many developing countries women have no access to land. Especially for rural households which depend on agriculture land is among the most important productive asset. Empirical evidence indicates that access to land is positively associated with higher incomes (World Bank, 2007). However, land tends to be distributed unevenly between men and women with the former owning by far the largest share. Deere and Leon (2003), for example, find that in some Latin American countries the male share of owners of farm land ranges between 70 and 90 percent. Moreover, female land owners commonly possess less land than their male counterparts.³ Underlying factors causing this inequality include inheritance and land titling laws in favor of men (King et al., 2007).

Second, women suffer from a limited access to formal credit markets (King et al., 2007). The problem is not so much that they are rejected for loans or are charged higher interest rates. Rather they do not tend to apply for loans because they do not dispose of collateral such as land or other property (e.g. Storey, 2004; Diagne et al., 2000; Ratusi and Swamy, 1999). Husbands or other male relatives may help getting credit by co-signing loans (Fafchamps, 2000). However, this support is by no means a matter of course and much harder to obtain by female headed households.

Third, insurance markets in (rural areas of) developing countries are – if existing at all – often hardly functioning. While both men and women are affected by such a market failure, the latter are likely to suffer more from it in the absence of a formal pension system and equal property rights. Also, women usually have very limited possibilities to contract health insurance and may get a respective access only “through spouses employed in formal sector jobs” (World Bank, 2001a).

Fourth, women have less access to the labor market than men.⁴ Gender discrimination in the labor market is a common phenomenon in both developed and developing countries. But while discrimination in the former is rather reflected in differential wage rates, discrimination in the latter is rather associated with differential access to wage employment (Collier, 1994). Often this is caused by cultural factors such as norms and traditions and not necessarily by gender discrimination in the labor market itself (which also exists). Already during childhood when households invest less in girls' schooling unequal labor opportunities are predetermined (World Bank, 2001a). Later on women's work is frequently confined to the home because of the “social stigma” against (manual) labor outside the household (Goldin, 1994). Other studies pointing at cultural reasons which restrict women's access to wage labor include Kumar et

³ For similar evidence regarding Sub-Saharan Africa see, for example, Doss (2005), Udry (1996), and Quisumbing et al. (2004).

⁴ The focus of this paragraph is on wage labor. With regard to self-employment recall that women suffer from a lack of access to land and capital which constitutes a serious obstacle to open up a business (e.g. King et al., 2007; Blackden and Bhanu, 1999; and ILO, 1995).

al. (1999), Dunlop and Velkoff (1999), as well as Drèze and Sen (1995). Also, there is another reason why women face a limited access to the labor market: Full-time jobs during set hours effectively exclude mothers from employment whereby their confinement to domestic work is perpetuated (World Bank, 2001a). Finally, even if female shares in formal employment are high – as is predominantly the case in East and Southeast Asia – women are paid significantly less than men. This wage differential cannot be explained by worker characteristics such as education and experience (e.g. Klasen, 2006; Horrace and Oaxaca, 2001; Blau and Kahn, 1994 and 1999).

In addition to the generally gender related economic gap there are disadvantages particular to female headed households. Most strikingly, households led by women carry a “double day burden” if their heads have to handle domestic work and the role of main earner simultaneously (Moghadam, 1997). Consequently, these women suffer from more pronounced time and mobility constraints than others which possibly impacts negatively on their households’ income (Buvinic and Gupta, 1997).

Furthermore, female headed households often lack support from both social networks and the state. For example, Bibars (2001) finds that for women in Egypt there is no institutional alternative to a male provider. Chant (2008) underlines that female heads may lack ties with ex-partners' relatives, as well as with their own families and communities. However, female household heads that are married and whose husband migrated may receive adequate remittances preventing them from experiencing destitution (Buvinic and Gupta, 1997). In our empirical analysis we address the latter point in greater detail.

Lastly, female farmers in developing countries tend to have less access to extension services (e.g. Chi et al., 1998; Quisumbing, 1994; Bisseleua, Kumase, and Klasen, 2008). Reasons for this disadvantage include relatively low levels of education, smaller farms and the fact that extension workers often are men who rather collaborate with male headed farms (Staudt, 1978). Regarding access to production technology female farmers are said to be worse off than their male counterparts, too (e.g. Chirwa, 2005; Asfaw and Admassie, 2004; Wier and Knight, 2000).

2.2 Ambiguous empirical evidence

Despite the abundance of reasons why female headed households may suffer more from deprivation, empirical evidence on how they translate into, as well as the gender dimensions of poverty is ambiguous (Chant, 2008). During the 1980s and early 1990s analyses about the “feminization of poverty” have proliferated stating that female headed households are the poorest of the poor (Chant, 2003). Simultaneously, it was pointed at the increase of the number of female headed households in many

developing countries (United Nations, 1995). Several studies emanating from the United Nations claimed that the share of women among the income poor would range between 60 and 70 percent (e.g. United Nations, 1996; UNDP, 1995).

However, this view was quickly criticized as being unsubstantiated leading Lipton and Ravallion (1995) to conclude that female headed households are not more likely to be poor than male headed ones. The same authors find that there is no disproportionate share of women in poor households either. Other prominent studies challenging the existence of a “feminization of poverty” and disapproving related “guesstimates” include Marcoux (1998), Chant (1997), and Kabeer (1996).

Several problems arising when assessing the relation between headship and poverty cause this ambiguous picture. Results depend on (i) the context, i.e. country, where analyses are conducted, (ii) the type of female headed household, (iii) the choice and use of equivalence scales, and (iv) the consideration of economies of scale. Buvinic and Gupta (1997) review 61 studies concerned with the poverty status of female headed households.⁵ They state that in 38 of these studies female headed households are said to constitute a higher share of poor households than male headed ones. However, according to 15 studies only certain types of female headed households are overrepresented among the poor and 8 studies find no evidence that female headed households are disproportionately among the poor. By contrast, Quisumbing et al. (2001) investigate the poverty status of female headed households in 10 developing countries using consistent methodologies across countries. Only in two cases they confirm that female headed households suffer more from poverty than households headed by men. The fact that the poverty situation of female headed households varies across countries is also underlined by findings from, for example, Lampietti and Stalker (2000), Ye (1998), and Haddad et al. (1996).

Besides country specific contexts, the differentiated picture of gender related poverty research is owed to the heterogeneity of female headed households. Therefore, in the literature it is increasingly refrained from superficial comparisons between male and female headed households and switched to the analysis of different types of the latter (Chant, 2008). On a rather aggregated level it is useful to distinguish between de jure and de facto female headed households. In case of the former women are the legal and customary heads. Examples are households headed by widows and unmarried, separated or divorced women. The latter have either a self reported female head whose husband is present or, more typically, a self reported male head who is absent for most of the time (Quisumbing et al., 2001). Studies analyzing

⁵ A broad range of definitions of female headed households was used in these studies. For a thorough discussion of different types of female headed households see below.

empirically the difference between de jure and de facto female headed households include, for instance, Chant (1997) who finds that in the Philippines in 1993 de facto female headed households had a higher per capita income than de jure female headed households.

According to Moghadam (2005) the majority of female heads of household in developing countries are widows followed by divorced or separated women. Widow heads – who mainly live alone or with other elderly family members (King et al., 2007) – are said to be particularly vulnerable to poverty (e.g. World Bank, 2001a; Lampietti and Stalker, 2000; Cox-Edwards 1999). Chen and Drèze (1995) ascertain that in India widowhood is a cause of economic deprivation. Widow headed households tend to have less productive assets and fewer savings than widowers, are less likely to have pension income, and often depend heavily on the economic support of their sons (Chen, 1998). Besides, single mothers have increasingly gained attention from researchers. In comparison to households in which both parents are present they lack an income earning partner and are likely to have to maintain more dependents at the same time (Chant, 2008). Consequently, they are often overrepresented among the poor (e.g. Koc, 1998). However, there are also households headed by women which may fare fairly well. For instance, de facto households headed by women whose husband migrated in order to work elsewhere may benefit from regularly sent remittances preventing them from falling into poverty (World Bank, 2001a).

Turning to methodological issues, the use (or neglect) of equivalence scales is crucial for the results of any poverty comparison between female and male headed households. Female headed households typically have higher dependency ratios than households headed by men. Hence, poverty of female headed households tends to be overestimated if consumption or income is measured per capita and not by adult equivalence scales. However, the use of the same adult equivalence scales across different countries may mask significant country specific peculiarities in the consumption needs of children (Quisumbing et al., 2001).⁶

Moreover, results can change significantly as soon as it is accounted for household size. Larger households might be able to satisfy the needs of their members at lower costs by exploiting household specific economies of scale (e.g. Deaton and Paxson, 1998; Lanjouw and Ravallion, 1995). That is, when economies of scales are neglected the contribution of typically smaller households such as female headed households to overall levels of poverty might be underestimated (Quisumbing et al., 2001). For example, Drèze and Srinivasan (1997) find no evidence suggesting that female headed households – and

⁶ For empirical evidence suggesting less differences in terms of poverty between female and male headed households when adult equivalence scales are used see, for instance, Louat et al. (1997).

particularly households headed by widows – are poorer than male headed ones if they do not account for economies of scale. However, the incorporation of even fairly small economies of scale in their analysis reveals that poverty rates are relatively high among single widows, widows living with unmarried children, and female household heads.

Although poverty assessments are ambiguous, it is frequently argued that female headed households should be targeted by policy interventions because they are assumed to transmit poverty to the next generation. This argument draws on female heads' "double day burden": They have to do domestic work and earn a great share of the household's income which may deter them from adequately supporting their family (Mehra et al., 2000). Thus, children of female headed households might be more likely to be poor in later stages of their lives (Lagerlof, 2003; Quisumbing et al., 2001).⁷ On the other hand, empirical evidence suggests that higher female income shares within a household are associated with higher expenditure shares for investment in human capital of children (e.g. Bussolo et al., 2009; Backiny-Yetna et al., 2009). Therefore, female headed households might spend more on the welfare of their children than male headed ones.

Although different methods to assess the poverty status of women in comparison to the one of men have been proposed, illustrating gender related poverty differences remains a challenging task. Inter alia, this can be attributed to the fact that consumption is typically measured at the household level without providing any information about the relative welfare of females in male headed or males in female headed households (e.g. Charmes, 2006; World Bank, 2001a). Non-monetary poverty assessments at the individual level can help to circumvent this lack of information. The few studies of this kind investigate, for instance, individuals' food intake or nutrition and find significant differences between men and women in South Asia but little of such evidence in other regions (e.g. Alderman, 2000; Appleton and Collier, 1995).

3. Female headed households and vulnerability

3.1 Vulnerability to poverty and downside risk

Even though evidence concerning shares of women among the (monetary) poor is unclear authors like Moghadam (2005) perceive the disadvantaged position of women as being "incontestable". Consequently, the question arises if there are other dimensions of poverty in which women in general

⁷ Therefore, Buvinic and Gupta (1997) criticize that "the more sophisticated consumption expenditure measures and adult-equivalence scales underestimate the poverty ... [related to] female headship, especially when poverty is measured inter-generationally."

and female headed households in particular are worse off.⁸ One such dimension might be the vulnerability of households, i.e. their exposure to adverse events, as well as the threat of poverty they face. In recent years research on the vulnerability of households has become increasingly popular (e.g. Naudé and McGillivray, 2009; Ligon and Schechter, 2003; World Bank, 2001b; Narayan et al., 2000).

Vulnerability is a source of deprivation which may even be interpreted as yet another dimension of poverty (e.g. Cafiero and Vakis, 2006). The exposure to downside risk and the inability to prevent, mitigate, and cope with its impact decreases the wellbeing of households regardless of their current level of material wealth. Ample qualitative and quantitative evidence suggests that particularly poor households in developing countries spend a lot of time and resources on reducing their exposure to such risk (Dercon, 2005).

Once adverse events occur households try to smooth their consumption in an attempt to cope with the shock. Respective literature proliferated during the last twenty years and is surveyed, for instance, in Deaton (1997) and Morduch (2004). Often, however, such smoothing efforts are not successful in keeping consumption levels stable suggesting a lack of adequate risk management strategies at the disposal of households. A common finding in this regard is that wealthier households have less difficulties in smoothing their consumption than relatively poor households (e.g. Jalan and Ravallion, 2001; Fafchamps et al., 1998; Rosenzweig and Wolpin, 1993).

Risk exposure and the inability to cope with adverse events are at the root of empirical evidence on poverty dynamics indicating that the poverty status of many households changes over time. Large proportions of poor households tend to move into and out of poverty. That is, they are exposed to “transitory poverty” (e.g. Dercon and Krishnan, 2000; Jalan and Ravallion, 2000). In contrast to transitionally poor households, there are also households experiencing “chronic poverty” (e.g. Chronic Poverty Research Centre, 2004). Again, this stable poverty status can be explained – at least partly – by vulnerability: Currently poor and risk adverse households apply strategies in order to prevent risks from happening. For instance, they invest in stable, low-return sources of income and not in projects whose outcome is more uncertain. This behavior may perpetuate households’ poverty leaving them chronically poor or, in other words, caught in a poverty trap (Chronic Poverty Research Centre, 2008). Moreover, the

⁸ A prominent dimension other than income and consumption analyzed in the context of gender research is time. Women are said to be particularly vulnerable to time poverty since they have to do domestic and reproductive work in addition to their market or non-market productive work (Charmes, 2006). Especially women with a double day burden such as single mothers may suffer from time poverty even if they are not deprived in terms of income and/or consumption (Udry, 1996).

possibly permanent impact of transitory shocks on, for example, productive assets can cause households to experience long-term poverty (Dercon, 2005).

Rather recently, researchers started to design and empirically apply measures in an attempt to quantify the vulnerability of households:⁹ Pritchett et al. (2000) put forward the concept of vulnerability as expected poverty which defines vulnerability as the probability that a household will be below a pre-determined poverty line in future. The concept incorporates the notion of risks that may push a household below the poverty line or keep it there into poverty research. Empirical applications of this concept are found in, inter alia, Christiaensen and Subbarao (2004), Kamanou and Morduch (2004), and Chaudhuri et al. (2002).

The concept of vulnerability as low expected utility introduced by Ligon and Schechter (2003) focuses on “expected utility”. Here household’s vulnerability equals the difference between household’s utility derived from its certainty-equivalent consumption and household’s expected utility derived from its current consumption. Positive future outcomes are allowed to compensate negative future outcomes. Vulnerability as low expected utility is empirically quantified by, for instance, Gaiha and Imai (2009), as well as Ligon and Schechter (2003, 2004).

Another approach interprets vulnerability as uninsured exposure to risk (e.g. Townsend, 1994). In its empirical application this concept measures whether (idiosyncratic) income shocks impact significantly on consumption changes. As in the case of vulnerability as low expected utility there is no reference to the poverty line. Vulnerability as uninsured exposure to risk is measured by, for example Gaiha and Imai (2009), Skoufias and Quisumbing (2005) and Amin et al. (2003).

Building on established axioms from poverty research Calvo and Dercon (2005) design a household specific measure of vulnerability to poverty. It interprets vulnerability as a probability weighted average of future states of the world specific indices of deprivation, i.e. poverty. The measure ranges from zero (not vulnerable) to one (most vulnerable). In a subsequent work Calvo and Dercon (2007) introduce an aggregate measure of vulnerability to poverty which builds on their axiomatic approach from 2005. Calvo (2008) is the first to combine multidimensional poverty with vulnerability research by measuring the vulnerability to consumption and leisure poverty.

⁹ For a more detailed assessment of the concepts of vulnerability as expected poverty, vulnerability as low expected utility, vulnerability as uninsured exposure to risk, and vulnerability to poverty, as well as their empirical applications see Povel (2010).

Similarly to Calvo and Dercon's measure perceived vulnerability to downside risk as proposed by Povel (2010) belongs to "the class of measures where vulnerability is a probability weighted average of state specific 'deprivation indices'..." (Calvo and Dercon, 2005). It exclusively considers future outcomes in which a household is worse off than today and sums up state of the world specific deprivation indices which are weighted with their respective probabilities. Also, it ranges from zero (not vulnerable) to one (most vulnerable), but differs from existing measures in its empirical application. More precisely, it accounts for the explicit risk perception of households, rather than predicting the future from previous shock exposure.¹⁰

In our empirical analysis below we apply a series of measures in order to test whether female headed households are more vulnerable including the measures proposed by Townsend (1994), Calvo and Decon (2005), as well as Povel (2010).

3.2 Vulnerability from a gender perspective

Although there is extensive literature on vulnerability, so far there is no or only little focus on the shock and risk exposure of female headed households. This negligence is even more surprising considering the fact that especially female headed households are likely to be prone to adverse events (e.g. Chant, 2008; Moghadam, 2005; Buvinic and Gupta, 1997). Lacking access to markets and other disadvantages mentioned above may seriously hamper the risk management capacities of female headed households (World Bank, 2001a).

A series of studies identify strategies applied by households in developing countries after a risk realizes. These include, for example, asset depletion (Fafchamps et al., 1998), borrowing (Udry, 1995), taking up additional occupations (Kochar, 1995), temporal migration (Lambert, 1994), drawing on governmental insurance schemes and/or informal risk-sharing networks (Townsend, 1994), as well as a change in expenditures at the expense of investment in human capital (Jacoby and Skoufias, 1997). However, when being exposed to an adverse event female headed households may not be able to apply these strategies because they lack access to certain assets such as land (asset depletion), to credit markets (borrowing), to labor markets (taking up additional occupations) and to insurance markets (drawing on insurance schemes), dispose of less social capital (informal risk-sharing networks), and are restricted in their mobility (temporal migration). Of the aforementioned examples merely a cut of expenditures for the

¹⁰ For a more detailed explanation of the quantification of perceived vulnerability to downside risk see Povel (2010) and below.

education of children seems to be possible. Such a coping strategy provides an argument for the likelihood of intergenerational transmission of poverty in female headed households.

Another important aspect of the impact of risks on female headed households is that the latter may be formed endogenously as a consequence of the occurrence of the former. This can happen directly if, for example, the male head dies or indirectly if the male head migrates in order to help the household to cope with a shock (Quisumbing et al., 2001).

Conversely, it may also be the case that female headed households could be less vulnerable. In particular, their lower exposure to markets could shield them from economic risks such as price shocks on the output or input side. Moreover, the endogeneity of female headed households may be a cause of them being better off. It may, for example, be the case that only women feel secure enough to form their own household if they are able to rely on steady income sources. This may be particularly relevant for households headed by young single women.

Despite the arguments in favor of (and against) female headed households being more vulnerable than their male headed counterparts, empirical work regarding this matter is scarce.¹¹ However, as we have seen in the case of poverty plausible reasons do not necessarily imply that empirical evidence is unambiguous. Therefore, it is all the more important to empirically test whether assumptions that female headed households are more prone to shocks than male headed ones can be substantiated or not.

4. Gender differences in Thailand and Vietnam

We focus our empirical analysis on Thailand and Vietnam, i.e. on two countries which experienced profound economic transitions, constantly high growth rates, as well as great success in poverty reduction during the last decades. On the other hand, both countries (particularly Thailand) have been exposed to the Asian crisis during the second half of the 1990s, suffer regularly from natural disasters (particularly Vietnam), and, more recently, experience food price shocks and the global economic slowdown (World Bank, 2009).¹² In addition to idiosyncratic risks at the household level this volatile economic environment renders the empirical analysis of poverty and vulnerability particularly relevant for Thai and Vietnamese households.

¹¹ Exceptions include, on the one hand, Glewwe and Hall (1998) who find that female headed households in Peru are not disproportionately vulnerable to macroeconomic shocks and, on the other hand, Aliiber (2003) who states that female headed households are overrepresented among the chronically poor in South Africa.

¹² Other rather country-specific shocks include political turmoil in Thailand and the overheating of Vietnam's economy in late 2007 (World Bank, 2009).

The review of country-specific literature reveals that gender differences in terms of poverty and opportunity seem to be less pronounced in Thailand and Vietnam than elsewhere. For example, Nguyen et al. (2007) find for Vietnam that the household head's sex is not correlated with the income quintile the respective household belongs to. Also, between 1992 and 1998 poverty reduction was more successful in the case of female- than in case of male headed households, which is mostly due to the high share of female headed households living in urban areas (Glewwe et al., 2002). Moreover, gender equality in gross enrollment rates which was already quite advanced in 1985 further improved during Vietnam's economic transition. (World Bank, 2001a). Finally, Vietnamese women are overrepresented in nonagricultural wage work mainly due to their high employment shares in manufacturing industries (World Bank, 2007).

However, the country seems to be well suited for an analysis of potentially marginalized and highly vulnerable groups such as female-headed households: First, the current global crisis is likely to affect especially export oriented manufacturing industries wherefore women might be more vulnerable to it than men. Second, a great deal of poverty reduction occurred in urban areas – but what happened to rural (female headed) households? Third and related to the preceding point, Vietnam's economic development is accompanied by increasing levels of inequality between rural and urban areas (e.g. Nguyen et al., 2007).

In Thailand, gender gaps seem to be rather small, too. Prior to the Asian crisis in 1997 the share of women employed in the industrial and service sector increased steadily (World Bank, 2001a). When the crisis materialized male employment was affected more severely than female employment because most jobs were lost in the male-dominated construction sector. Also, men's wages were hit (slightly) harder than the ones of women during the crisis (Behrman and Tinakorn, 1999). However, Deolalikar (2002) reveals that residence in female-headed households is associated with a higher incidence of poverty. Given this finding and the aforementioned volatile economic and political environment also Thailand is an interesting study site for the analysis of gender differences in terms of poverty and vulnerability.

5. Empirical analysis

5.1 Data

Our empirical analysis relies on data from a household panel survey conducted in two consecutive years in 2007 and 2008, with a focus on household dynamics and vulnerability. Data was collected from some

4400 households in six rural provinces in Thailand and Vietnam. These include the Thai provinces of Buriram, Ubon Rachathani and Nakhon Phanom and the Vietnamese provinces of Ha Tinh, Thua Thien-Hue and Dak Lak. The provinces are predominantly rural and rank in the lowest income quintile among each country's provinces.

The sample of households was selected via a three-stage cluster-sampling procedure. The six provinces served as strata. In each of them sub-districts were selected with a probability proportional to their number of households. Special attention was paid to population density in order to ensure that densely, as well as sparsely populated sub-districts were covered adequately, leading to slight oversampling of the latter. Within each sub-district two villages were drawn with a probability proportional to their number of households. In a last stage ten households from each village were randomly selected for the sample.

The survey questionnaire covers information about (i) household member characteristics such as demographics, education and health; (ii) shocks and risks; (iii) agriculture; (iv) off-farm and self-employment; (v) borrowing, lending, public transfers and insurance; (vi) expenditures; (vii) assets; and (viii) housing conditions. Especially the shock and risk sections of the questionnaire which address numerous income, health and social events are crucial to our analysis. The shock section is designed to record adverse events experienced by households. Among others, it aims at shedding light on the severity of adverse events by asking about their impact on income, assets and additional expenditures. The shock sections from both waves enable us to quantify ex-ante correlates (from wave 1) of shock exposure (as recorded in wave 2) of households. The risk section aims at eliciting information about the frequency, as well as the severity of downside risks households expect to occur during the upcoming five years. The subjective information obtained in this section is forward looking wherefore it allows analyzing the ex-ante perceived risk exposure of households.

5.2 Methodology

In the empirical part of our study we examine whether female headed households are consumption poorer and more vulnerable than households headed by men in rural Thailand and Vietnam. More specifically, we analyze country specific correlations between female headship and the dependent variables consumption, consumption change over time, shock exposure, shock severity, vulnerability to poverty and perceived vulnerability to downside risk.

Each dependent variable is regressed on three sets of covariates that differ with respect to the dummy variables which represent unlike types of female headed households. Besides using a dummy that equals one if the household head is female and zero otherwise in the first specification, we differentiate between de jure and de facto female headed households in the second, as well as between households whose female heads are widows, singles or have an absent husband in the third specification. This set up allows us to reveal possible dissimilarities between different sorts of female headed households.

Moreover, each specification consists of location dummies to control for unobserved spatial heterogeneity and the following household (head) characteristics:¹³ Household size measured in adult equivalents; dependency ratio; log of land holdings; non-exclusive dummies indicating whether the household is engaged in non-farm activities and/or the crop and livestock sector; as well as household head's education and age. We expect household size and dependency ratio to be negatively correlated with per adult equivalent consumption but positively with shock exposure and vulnerability since larger households with a relatively high share of dependent members are more likely exposed to health shocks, for example. Land holdings proxy households' wealth why they should be positively associated with consumption. With respect to shock exposure and vulnerability the direction of the correlation is a priori ambiguous because larger land holdings may increase exposure to agricultural and climatic shocks, on the one hand, but improve households' mitigation and coping capacities, on the other. The non-exclusive dummies for economic activities control for the income stream of households which we expect to consume less when engaged in agriculture. Regarding vulnerability the direction of the correlation may run in both directions since income diversification can be an efficient strategy to improve consumption smoothing. However, a larger income stream also results in more income sources being at risk of experiencing a shock. Finally, household head's education and age are supposed to be positively associated with consumption and negatively with vulnerability because better educated and more experienced heads are likely to generate higher incomes and manage risks better. These additional control variables decrease any bias of the female headship dummies due to omitted variables. Nonetheless, given the data and set up at hand we certainly cannot discard the possibility of such a bias.

Our first dependent variable is the log of per adult equivalent (World Bank scale) consumption per day of household i ($\ln(cons)_i$) which is calculated assuming economies of scale of 0.8 within each household.¹⁴ By choosing this measure of consumption we account for systematic differences between

¹³ When investigating the correlates of shock severity we additionally include shock type dummies (see below).

¹⁴ Note that for Thailand and Vietnam there no country specific equivalence scales exist.

female and male headed households that may bias our results and are discussed above. We run the following cross-sectional OLS regressions separately for each country and wave:

$$(1) \quad \ln(\text{cons})_i = \alpha + \beta * FHH'_i + \gamma * X'_i + \varepsilon_i$$

where FHH'_i denotes a vector of dummies for different types of female headship and X'_i is a vector including village dummies and household characteristics. ε_i is a random error assumed to be independent and identically distributed. We apply survey weights and report robust standard errors. β is the coefficient of interest and indicates whether headship is significantly correlated with consumption. We use Wald tests for joint significance in order to determine whether female headship dummies are jointly significant.

Second, we examine the shock exposure of female headed households by estimating the probability that household i experiences an adverse event between wave one and wave two ($Pr(\text{shock}_{i0} = 1)$) as a function of female headship dummies (FHH'_{i-1}), district dummies and household characteristics (X'_{i-1}) from wave one:

$$(2) \quad Pr(\text{shock}_{i0} = 1) = f(FHH'_{i-1}, X'_{i-1})$$

We use a probit model, apply survey weights and report marginal effects, as well as robust standard errors. Again we investigate whether female headship dummies are jointly significant by running Chi² tests for joint significance. By regressing shock dummies on covariates that were measured before the adverse event materialized we avoid problems of reverse causality.

Third, we scrutinize whether female headed households tend to suffer from more severe shocks than male headed households. For this purpose we run, on the one hand, OLS regressions of the following type:¹⁵

$$(3) \quad \text{severity}_i = \alpha + \beta * FHH'_{i-1} + \delta * \text{shock_type}'_i + \gamma * X'_{i-1} + \varepsilon_i$$

where severity_i is household i 's perceived severity of the shock it experienced between wave one and wave two, FHH'_{i-1} is a vector of female headship dummies from wave one and X'_{i-1} a vector of village dummies and household characteristics (X'_{i-1}) from wave one. We also include shock type dummies ($\text{shock_type}'_i$) to control for the different nature of shocks.¹⁶ The dependent variable ranges between 0

¹⁵ Note that this estimation is implemented for the subsample of households which experienced a shock between wave 1 and wave 2.

¹⁶ The shock type dummies include market, agricultural supply, health and social shocks.

(least severe) and 1 (most severe). We apply survey weights, report robust standard errors and run Wald tests for joint significance of the female headship dummies. FHH'_{i-1} and X'_{i-1} are recorded prior to $severity_i$ why we are not concerned with issues of reverse causality. On the other hand, we use a Tobit model to estimate correlates of income and asset losses, as well as additional expenditures that were triggered by a shock. The corresponding equation is specified as follows:

$$(4) \quad \begin{aligned} loss_i &= \beta * FHH'_{i-1} + \delta * shock_type'_i + \gamma * X'_{i-1} + \varepsilon_i & \text{if } loss_i^* > 0 \\ loss_i &= 0 & \text{if } loss_i^* \leq 0 \end{aligned}$$

$loss_i$ represents household i 's income loss, asset loss or additional expenditures due to shocks between wave one and wave two. $loss_i^*$ is the household's actual, in case of a negative value unobserved loss.¹⁷ The covariates are the same as in equation three. Again we apply survey weights, report robust standard errors and avoid problems of reverse causality by using lagged explanatory variables. Chi² tests are used to test for joint significance of female headship dummies.

Fourth, we investigate to what degree female headed households are able to insure their consumption against changes in income. There is a large literature about risk sharing in village economies that tries to measure how well idiosyncratic income shocks can be insured by village communities (see above and, for example, Townsend, 1994). We follow the approach from these contributions and regress changes in log of per adult equivalent (World Bank scale) consumption per day of household i between wave one and wave two (measured as share of consumption in wave one; $\Delta \ln (cons)_i$) on income change between both waves (measured as share of income in wave one; Δy_i), female headship dummies (FHH'_i) from wave one, interactions of income change and female headship dummies and village dummies from wave one (X'_i).¹⁸

$$(5) \quad \Delta \ln (cons)_i = \alpha + \beta * \Delta y_i + \gamma * FHH'_i + \delta * (\Delta y_i * FHH'_i) + \varphi * X'_i + \varepsilon_i$$

For our estimation we use OLS, apply survey weights, report robust standard errors and run Wald tests for joint significance of female headship dummies. Δy_i is an instrument for idiosyncratic income shocks experienced by household i during the reference period. The village dummies are expected to soak up any correlation between covariate income shocks and consumption. β represents the degree to which households are able to smooth their consumption. If it is significantly different from zero there is no

¹⁷ Note that shocks may result in, for example, a cut of expenditures, i.e. negative additional expenditures.

¹⁸ We assume economies of scale of 0.8 within each household.

perfect risk sharing within the sampled villages. A significant δ implies that consumption smoothing capacities of female headed households are significantly different from the ones of other households.

Equation two measures the probability that a household experiences a shock, equations three, four and five the impact of such events on different welfare dimensions. However, in order to holistically assess the vulnerability of female headed households we have to use dependent variables that combine both shock exposure and shock severity. Therefore, we calculate a household specific measure of vulnerability to poverty (VTP_i) as proposed by Calvo and Dercon (2005) and shown in equation six:

$$(6) \quad VTP_i = 1 - \left(\sum_{j=1}^{N_i} p_{ij} \times x_{ij}^\alpha \right), \quad \text{with}$$

$$0 \leq x_{ij} \leq 1, \quad \sum_{j=1}^{N_i} p_{ij} = 1 \quad \text{and} \quad 0 \leq \alpha \leq 1.$$

p_{ij} denotes the probability of state of the world j to occur and x_{ij} is a state specific degree of deprivation which equals $\frac{\tilde{y}_{ij}}{z}$. \tilde{y}_{ij} is a censored outcome measure. That is, all outcomes where y_{ij} is above the poverty line z are censored at z and consequently do not change the vulnerability measure. VTP_i ranges between zero and one. There is a total of N_i possible states of the world. The closer (further away) α moves to (from) one the less (more) risk aversion is assumed. We predict district specific shock probabilities, as well as households specific shock severities. The product of these predictions is used to calculate VTP_i . α is set equal to 0.5 and USD PPP 2 per capita and day defined as poverty line. We run cross-sectional OLS regressions of the following type separately for each country and wave:

$$(7) \quad VTP_i = \alpha + \beta * FHH'_i + \gamma * X'_i + \varepsilon_i$$

where FHH'_i is a vector of dummies for different types of female headship and X'_i is a vector including village dummies and household characteristics. ε_i is a random error assumed to be independent and identically distributed. We apply survey weights, report robust standard errors and run Wald tests for joint significance of female headship dummies. β indicates whether female headship is significantly correlated with vulnerability to poverty.

Finally, we quantify perceived vulnerability to downside risk (VTR_i) in our sample as proposed by Povel (2010). The measure of vulnerability to downside risk assigns an index of deprivation d_{hi} – with zero implying no deprivation and one implying the highest possible deprivation – to every state of the world j

a household i possibly experiences in the future and weighs it with its probability of occurrence p_{ij} . Thus, a household's vulnerability equals:

$$(8) \quad VTR_i = \sum_{j=1}^{N_i} (d_{ij}^\alpha \times p_{ij}), \text{ with}$$

$$0 \leq d_{ij} \leq 1 \quad \text{and} \quad \sum_{j=1}^{N_i} p_{ij} = 1.$$

α is a parameter measuring risk attitudes. Assuming risk-aversion we set α equal to two. The measure of perceived vulnerability to downside risk differs from the measure of vulnerability to poverty in the choice of the relevant benchmark: The latter uses the poverty line while the former relies on the current level of wellbeing. We calculate a measure of vulnerability to downside risk that relies on households' subjective risk perception regarding twelve different adverse events in wave two. Using OLS we estimate for each country:

$$(9) \quad VTR_i = \alpha + \beta * FHH'_i + \gamma * X'_i + \varepsilon_i$$

where the covariates are the same as in equation seven. Again we apply survey weights, report robust standard errors and run Wald tests for joint significance of female headship dummies. β indicates whether female headship is significantly correlated with vulnerability to downside risk.

5.3 Results

Descriptive statistics – composition of households

As table 1a indicates there are 451 (20.8% of all Thai households) headed households in Thailand in wave one.¹⁹ Of these 359 (79.6%) households are de jure and 92 (20.4%) are de facto female headed. Disaggregating the subgroups even further we see that de jure female headed households are made up of 298 (83.0%) widow headed and 61 (17.0%) single (unmarried or divorced) female headed households. The subgroup of de facto female headed households counts 92 observations and consists entirely of households in which female heads' husbands are absent. In Vietnam there are less female headed households: 323 or 15.1% of all Vietnamese households belong to this category. Of the 265 (81.4% of all Vietnamese female headed households) de jure female headed households in Vietnam 202 (76.0%) are headed by a widow and 63 (24.0%) by a single female. In 58 households female head's husbands are absent.

¹⁹ Note that for all percentage values population weights are applied.

In wave two there are only 420 female headed households in Thailand which constitute 19.8% of the Thai subsample (table 1b). This decrease is partly driven by sample attrition (also the number of male headed households is smaller than in wave one). There are still many more de jure (81.4%) than de facto (18.6%) female headed households and 289 widow heads constitute the biggest subgroup of female headed households. Contrary to the Thai case, in Vietnam the number of female headed households increases to 334 (15.8%) in wave two. The composition of female headed households remains largely constant with 80.3% being de jure female headed out of which 204 (75.8%) have widow heads. In other words, in both countries and both waves the big majority of female headed households are widow headed. Also, the share of de facto female headed households is similar across space (between Thailand and Vietnam) and time (wave one and two) and ranges between 18 and 20%.

Correlation between consumption and female headship

Tables 2a and 2b show the results of OLS regressions which measure the correlation between consumption and female headship, as well as other regressors in waves one and two. Summary statistics of the covariates by household type are provided in the appendix. Somewhat surprisingly we find that Thai female headed households are significantly consumption richer than their male headed counterparts (column 1, table 2a). The respective coefficient is significant at the 1%-level. Consumption of female headed households is on average 9.4% higher than consumption of other households.²⁰ By contrast, female headed households in Vietnam are on average poorer than male headed ones although this difference is statistically not distinguishable from zero (column 2, table 2a). Splitting the female headship dummy into de facto and de jure provides a richer picture (columns 3 and 4, table 2a): The Thai result is driven by de facto female headed households who consume on average 28.9% (!) more than male headed households (significant at 1%-level). The overall insignificant difference between both household types in Vietnam is due to the fact that de facto female headed households consume significantly more (18.3%) and de jure female headed households significantly less (-8.5%) than male headed ones. The latter result can be attributed to single female headed households whose consumption is on average 21.0% below the consumption of male headed households (significant at 1%-level; column 6, table 2a). The relatively high consumption of de facto female headed households in both countries can most likely be ascribed to the fact that they receive substantial remittances from their absent household members. The correlation between female headship and consumption is robust over time as is indicated by very similar coefficients and significance levels in wave two (table 2b). In every

²⁰ Following Halvorsen and Palmquist (1980) we transform the point estimate via $[\exp(\beta)-1]*100$ to obtain the percentage difference.

specification with more than one female headship dummy the dummies are jointly significant at least at the 5%-level (last row, tables 2a and 2b).

The other covariates enter the regressions from wave one largely as expected (table 2a): Household size is associated with significantly lower consumption across all specifications. A higher dependency ratio implies lower consumption, too. However, this relationship is only significant in Thailand. Household heads' level of education and age are positively (and largely significantly) correlated with consumption. The correlation between household head's age and consumption is non-linear as is indicated by the significantly negative coefficient of squared household head's age. Households' wealth is approximated by logged land holdings whose coefficient is positive and significant throughout all specifications. Finally, households who receive income from the non-farm sector are on average significantly richer than households who do not whereas households engaged in cropping are significantly poorer. Being engaged in the livestock sector is associated with lower levels of consumption in both countries though this correlation is only significant in Vietnam. Results between wave one and two differ only very slightly (table 2b).

Descriptive statistics – shock incidence

After having established that de facto female headed households are consumption richer in both countries and that, at least in Vietnam, the correlation between different types of female headship and consumption is heterogeneous we turn to households' shock exposure. Tables 3a and 3b show that the incidence of adverse events differs to a great deal between both countries and both waves. The 57.3% of Vietnamese households that report to have experienced an adverse event in wave one by far exceed the 32.4% of Thai households that were shock affected (table 3a). In wave two the percentage of households that stated to have experienced a shock during the reference period increases sharply in both countries – to 61% in Thailand and 72% in Vietnam (table 3b). In Vietnam this big difference is mainly driven by climatic conditions: While 16.2% of households were affected by storms, heavy rainfall and cold temperatures during the first reference period, 46.3% were hit by such events during the second reference period. In Thailand the percentage of households suffering from a drought rose from 10.0% in wave one to 23.5% in wave two. Generally, agricultural supply shocks which include adverse weather events are most common in both countries and both waves suggesting that climatic volatility poses a serious threat to households' wellbeing. Between 6.4% (Thailand, wave one) and 19.6% (Vietnam, wave two) of households are affected by illnesses. This result is similar to the one of Wagstaff and Lindelow (2010) who find that in neighboring Laos illnesses are the most common type of (not-aggregated) shocks.

Other adverse events with relatively high incidence, i.e. hitting at least in one country and wave more than 10% of households, include crop pests, price shocks and livestock diseases. In both waves market shocks play a more important role in Thailand than in Vietnam whereas the share of households suffering from social shocks is similar across countries and waves. Agricultural supply shocks matter most in Vietnam. Health shocks affect around 24% of Vietnamese households in both waves while in Thailand the respective percentage increases from 9.9% to 23.6% over time. All in all, we find that the incidence of adverse events is heterogeneous across space and time.

Female and male headed households are similarly exposed to shocks in wave one (appendix A). In both countries male headed households are relatively more prone to agricultural supply shocks whereas households headed by women suffer more frequently from health shocks. This result is in line with de facto female headed households relying more on remittances than on own agricultural production and de jure female headed households having more physically vulnerable members (widows). Data from wave two shows an alike pattern (appendix B).

Correlation between shock probability and female headship

In order to further scrutinize these insights we run probit regressions with a depend variable that equals one if the observed household experiences any shock in wave two and zero otherwise (table 4). All marginal effects of female headed household dummies are positive suggesting that these types of households tend to be more exposed to shocks on average when it is controlled for other observables. However, in none of the specifications a female headed households dummy is significantly correlated with the dependent variable. Also the tests for joint significance fail to reject the null hypothesis that the dummy variables are jointly insignificant.

Significant and positive correlates of the dependent shock dummy are household size in Thailand, the crop sector dummy in Vietnam, as well as logged land holdings in both countries. That is, land seems to be rather a proxy for the magnitude of planted crops, as opposed to wealth. Many planted crops probably render households more susceptible to events such as crop pests and bad weather which would also explain the positive association between engagement in the crop sector and shock exposure in Vietnam. Finally, in Thailand households headed by an individual with tertiary education are significantly less likely hit by a shock than households with a head with no education.

We also run regressions as in table 4 for modified dependent variables capturing only income, market, agricultural supply, health, and social shocks, respectively (results not reported). The coefficients of

female headship dummies are largely insignificant in these regressions. Only in Vietnam de facto female headed households are around 10% less likely than male headed households to experience a health shock and about 7% more likely to be hit by a social shock (both significant). All in all we do not find a clear pattern which suggests that female headed households are systematically more prone to shocks than male headed households.

Correlation between shock severity and female headship

Turning to the perceived severity of adverse events which materialized between waves one and two we find negative coefficients in the case of de facto and de jure female headed households in Vietnam (column 4, table 5). These correlations are significant at the 10%-level. The association between households headed by widows and perceived severity is negative and significant at the 5%-level (column 6). We suppose that Vietnamese widows perceive shocks as having a relatively small impact because most of them have already experienced more severe events during the past such as the death of their husbands. In Thailand neither female headed households nor subgroups thereof differ significantly from households led by men in terms of perceived shock severity (columns 1, 3 and 5). Rather, economic activities seem to be relevant: households engaged in the off-farm sector perceive comparable shocks to be significantly less severe, while households that grow crops experience these shocks with higher more severity.

Table 6 shows marginal effects from a tobit regression of logged asset loss in USD PPP on our standard covariates.²¹ In Thailand no type of female headed households loses significantly more assets as a consequence of a shock (columns 1, 3 and 5). By contrast, in Vietnam households led by women lose significantly more (column 2). This result is driven by de facto female headed households (column 4). It gains importance when we consider the argument that the loss of productive assets may be at the root of long term poverty (e.g. Dercon, 2005). However, we do not know what kind of assets households lose. We also run tobit regressions of the same type with logged income loss and additional expenditures in USD PPP as dependent variables (results not reported). In none of these estimations we find significant correlations between the variables of interest, with exception of households headed by single women in Vietnam which incur lower additional expenditures due to shocks. We interpret this finding as reflecting the relative poverty of this type of households that cannot afford to raise expenditures. All in all we do not find statistical evidence suggesting that shocks experienced by Thai households are more severe if

²¹ Note that we cannot discard the possibility that respondents mix asset loss as result of a shock and asset depletion as result of a coping strategy when stating the value of lost assets. Results should be interpreted with this potential drawback in mind.

these households are headed by women. In Vietnam on the other hand, there are heterogeneous and significant correlations between shock severity and female headship.

Correlation between consumption smoothing and female headship

Next we quantify consumption smoothing capacities of households in order to assess possible differences between households headed by males and females. Therefore, we regress consumption change between both survey rounds on income change during the same period, female headship dummies and interactions between the two, as well as on village dummies (table 7). This approach follows Townsend (1994) where the coefficient of income change can be interpreted as measuring the degree of uninsured exposure to risk. Households in Thai villages do not seem to perfectly share risk as is indicated by significant positive coefficients of income change (columns 1, 3, and 5). According to the point estimates a 100% shortfall in income would lead on average to a 5.7% reduction in consumption which still implies a fairly large degree of risk sharing. In Vietnam we find suggestive evidence for perfect risk sharing within village economies since income change does not co-vary significantly with consumption change. However, these results have to be interpreted cautiously since income may be affected by measurement error which would attenuate its coefficients towards zero. In fact, the number of observations in both countries is less than half of the full sample size due to unreasonably changes in consumption and/or income over time for many households.

Consumption change of female headed household is not significantly different from the one of male headed households. This finding holds true for all types of female headed households in both countries. The interaction terms of female headed household dummies and income change suggest that this group of households is significantly less able to smooth its consumption than male headed households in Thailand. Thus, the consumption of households with female heads co-varies on average by 22 percentage points more with a 100% change in income (column 1). All different sub groups of female headed households contribute to this correlation (columns 3 and 5). Also in Vietnam changes in income of female headed households result in significantly larger changes in consumption than is the case for households headed by males. But the statistically significant coefficient (at the 10%-level) implies that a change in income of 100% only leads to a difference of 0.3 percentage points in consumption change between female and male headed households (column 2). This result is driven by widow headed households (columns 4 and 6). These findings suggest that at least in Thailand a broad range of female headed households smoothes its consumption less well than male headed households against changes in income.

Correlation between vulnerability to poverty and female headship

Next we analyze correlates of vulnerability to poverty which we calculate separately for both countries and both waves (tables 8a and 8b). In Thailand female headed households are significantly less vulnerable to poverty than male headed households in wave one (column 1, table 8a). This correlation is significant at the 10%-level and can mainly be attributed to de facto female headed households (columns 3 and 5). It is in line with results from table 2a which suggest that (de facto) female headed households are consumption richer than their male headed counterparts. The former are on average sufficiently high above the poverty line to protect them from the threat of poverty. This rational also serves to explain the significantly negative association between de facto female headed households and vulnerability to poverty in Vietnam (column 4).

The results from wave two are somewhat different: In Thailand there is no statistically significant difference between any type of female headed household, on the one hand, and male headed households, on the other (columns 1, 3, and 5, table 8b). By contrast, in Vietnam de facto female headed households are again significantly less vulnerable to poverty (column 4). Also, for the first time we find that a type of female headship, namely widow heads, is positively correlated with the outcome variable (column 6). This association is significant at the 10%-level.

The other covariates in tables 8a and 8b exhibit largely plausible correlations with vulnerability to poverty: Household size and dependency ratio increase vulnerability significantly across all specifications. Instead, household head's education and logged land holdings are associated with significantly lower levels of vulnerability. In both waves Vietnamese households that plant crops (with an off-farm income source) are significantly more (less) vulnerable to poverty than households that do not. Household head's age tends to be negatively correlated with the dependent variable in Vietnam put positively in Thailand.

Correlation between perceived vulnerability to downside risk and female headship

We finally turn to a subjective measure of vulnerability. Following Povel (2010) we calculate household specific perceived vulnerability to downside risk in wave two and regress it on our benchmark regression used throughout the paper (table 9).²² Neither in Thailand nor in Vietnam female headed households seem to differ from households headed by men in terms of perceived vulnerability to downside risk.

²² The risk underlying our measure of perceived vulnerability to downside risk include (i) strong decrease of output prices, (ii) strong increase of input prices, (iii) strong increase of interest rate for loans, (iv) collapse of business, (v) change in market regulations, (vi) flooding, (vii) unusually heavy rainfall, (viii) drought, (ix) crop pest, (x) storage pest, (xi) livestock disease, and (xii) landslide/erosion.

Merely the de facto female headed household dummy is significantly negative at the 10%-level in Vietnam (column 4). However, in the same specification the two female headship dummies are not jointly significant as indicated by a p-value of 0.225 (column 4, last row).

6. Conclusion

Female headed households are often thought to be disadvantaged regarding the access to land, labor, credit and insurance markets, discriminated against by cultural norms and suffering from high dependency burdens, economic immobility and the “double day burden” of the women heading them. Despite such assertions research regarding the relative poverty status of female headed households is inconclusive. In addition, there is little empirical evidence regarding the vulnerability of this type of households. We aim at contributing to the discussion by scrutinizing whether female headed households from rural Thailand and Vietnam consume less, are more exposed to shocks, suffer from more severe shocks, experience larger uninsured risk, and are more vulnerable to poverty and perceived downside risk than male headed households.

All in all, we do not find much evidence that female headship is associated with less wellbeing or more vulnerability. Certainly households headed by single women are consumption poorer in both waves in Vietnam. But in both countries during both time periods de facto female headed households are consumption richer than their male headed counterparts. The latter result is in accordance with other studies suggesting that de facto female headed households are relatively wealthy, possibly due to remittances (e.g. Chant, 1997, and World Bank, 2001a). Also, female headed households are not more likely to be hit by adverse events. In case they experience a shock they do not differ from male headed households (in Thailand) or are less badly affected (in Vietnam) with respect to the severity they perceive. In terms of asset loss as a consequence of a shock de facto female headed households in Vietnam suffer significantly more than households headed by men. This, however, renders them neither less able to smooth their consumption nor more vulnerable to poverty or downside risk. It may simply imply that they have more to lose since they are wealthier. Instead, a broad range of Thai female headed households perform worse in consumption smoothing, implying larger uninsured risks. But as is the case in Vietnam they tend not to be more vulnerable to poverty and de facto female headed households are even vulnerable. Also, with regard to perceived vulnerability to downside risk we do not find significant dissimilarities between in households headed by men and women Thailand.

Although there are some exceptions concerning subgroups of female headed households our results for rural Thailand and Vietnam broadly contradict theoretical considerations and empirical findings

suggesting that female headed households are more vulnerable (e.g. Chant, 2008; Moghadam, 2005; Buvinic and Gupta, 1997). Therefore, we conclude that there is no obvious need to target all types of female headed households with poverty and vulnerability reducing policies. However, widows and households headed by unmarried women may very well deserve intervention. We look forward to future research that scrutinizes the external validity of our results, on the one hand, and tries to establish causalities, on the other.

Table 1a: Headship and sample size – wave 1

Country	Female		Male
Thailand	451		1724
	20.8%		79.2%
Vietnam	323		1867
	15.1%		84.9%
	De Jure		De Facto
Thailand	359		92
	79.6%		20.4%
Vietnam	265		58
	81.4%		18.6%
	Widow	Single	Absent Husband
Thailand	298	61	92
	83.0%	17.0%	100.0%
Vietnam	202	63	58
	76.0%	24.0%	100.0%

Note: Percent by subgroup and population weighted

Table 1b: Headship and sample size – wave 2

Country	Female		Male
Thailand	420		1701
	19.8%		80.2%
Vietnam	334		1810
	15.8%		84.2%
	De Jure		De Facto
Thailand	342		78
	81.4%		18.6%
Vietnam	267		67
	80.3%		19.7%
	Widow	Single	Absent Husband
Thailand	289	53	78
	84.5%	15.5%	100.0%
Vietnam	204	63	67
	75.8%	24.2%	100.0%

Note: Percent by subgroup and population weighted

Table 2a: Correlates of consumption – wave 1

Outcome	ln(Consumption)													
	(1)		(2)		(3)		(4)		(5)		(6)			
	Female Head		De Facto vs. De Jure		FHH Subgroups		Thailand		Vietnam		Thailand		Vietnam	
OLS	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	0.0936***	-0.0289												
	(0.0297)	(0.0350)												
De Facto FHH			0.289***	0.183**										
			(0.0482)	(0.0697)										
De Jure FHH			0.0380	-0.0854**										
			(0.0335)	(0.0372)										
FHH, absent husband							0.293***	0.178**						
							(0.0483)	(0.0697)						
FHH, widow							0.0190	-0.0459						
							(0.0348)	(0.0377)						
FHH, single							0.122	-0.210***						
							(0.0744)	(0.0736)						
HH Size (Adult Equivalents)	-0.103***	-0.131***	-0.101***	-0.132***	-0.0999***	-0.134***								
	(0.0164)	(0.0149)	(0.0165)	(0.0149)	(0.0164)	(0.0148)								
Dep. Ratio	-0.0296*	-0.0110	-0.0375**	-0.0168	-0.0377**	-0.0164								
	(0.0158)	(0.0145)	(0.0161)	(0.0149)	(0.0160)	(0.0147)								
Head: Primary Education	0.0863**	0.0864***	0.0774**	0.0716**	0.0766**	0.0726**								
	(0.0355)	(0.0328)	(0.0351)	(0.0335)	(0.0349)	(0.0333)								
Head: Middle School Education	0.204***	0.221***	0.196***	0.204***	0.196***	0.205***								
	(0.0623)	(0.0320)	(0.0616)	(0.0327)	(0.0618)	(0.0327)								
Head: Secondary Education	0.491***	0.347***	0.490***	0.330***	0.488***	0.330***								
	(0.0654)	(0.0413)	(0.0653)	(0.0417)	(0.0655)	(0.0421)								
Head: Tertiary Education	0.667***	0.531***	0.657***	0.507***	0.653***	0.504***								
	(0.0707)	(0.0531)	(0.0704)	(0.0543)	(0.0707)	(0.0544)								
Age of Head	0.0101*	0.0250***	0.0128**	0.0270***	0.0127**	0.0277***								
	(0.00601)	(0.00578)	(0.00601)	(0.00565)	(0.00599)	(0.00571)								
Age Sq.	-0.000131**	-0.000247***	-0.000145***	-0.000260***	-0.000142***	-0.000269***								
	(5.36e-05)	(5.62e-05)	(5.34e-05)	(5.53e-05)	(5.32e-05)	(5.59e-05)								
Ln(Land)	0.105***	0.107***	0.107***	0.104***	0.107***	0.103***								
	(0.0111)	(0.0126)	(0.0111)	(0.0127)	(0.0111)	(0.0127)								

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Table 2a: continued

Non-Farm Sector	0.0524** (0.0254)	0.0438** (0.0220)	0.0647** (0.0260)	0.0534** (0.0220)	0.0650** (0.0260)	0.0517** (0.0220)
Crops Sector	-0.155*** (0.0405)	-0.245*** (0.0462)	-0.159*** (0.0403)	-0.241*** (0.0465)	-0.159*** (0.0404)	-0.242*** (0.0461)
Livestock Sector	-0.0391 (0.0264)	-0.0830*** (0.0297)	-0.0387 (0.0261)	-0.0851*** (0.0294)	-0.0378 (0.0262)	-0.0891*** (0.0292)
Constant	7.753*** (0.198)	7.314*** (0.161)	7.658*** (0.202)	7.273*** (0.161)	7.649*** (0.201)	7.264*** (0.161)
Observations	2,169	2,180	2,169	2,180	2,169	2,180
Adjusted R-squared	0.215	0.386	0.221	0.391	0.221	0.393
FHH joint significance test	9.952	0.681	18.00	6.673	12.45	5.664
FHH joint significance p-value	0.002	0.411	0.000	0.002	0.000	0.001

Results weighted; Robust standard errors in parentheses

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

Outcome: log of Consumption per day per Adult Equivalent (World Bank Scale) with Economies of Scale (0.8)

Reference group for Educational Attainment: No Education

Income sector dummies are not exclusive (no reference group)

Village dummies not reported

Table 2b: Correlates of consumption – wave 2

Outcome	ln(Consumption)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
OLS						
Female Head	0.0777** (0.0345)	-0.0350 (0.0323)				
De Facto FHH			0.188*** (0.0667)	0.203*** (0.0680)		
De Jure FHH			0.0495 (0.0384)	-0.101*** (0.0353)		
FHH, absent husband					0.187*** (0.0667)	0.196*** (0.0678)
FHH, widow					0.0598 (0.0429)	-0.0504 (0.0390)
FHH, single					-0.00195 (0.0826)	-0.253*** (0.0638)
HH Size (Adult Equivalents)	-0.164*** (0.0187)	-0.179*** (0.0159)	-0.162*** (0.0187)	-0.181*** (0.0158)	-0.163*** (0.0188)	-0.183*** (0.0157)
Dep. Ratio	-0.0538*** (0.0165)	-0.0272 (0.0174)	-0.0565*** (0.0167)	-0.0325* (0.0178)	-0.0566*** (0.0167)	-0.0303* (0.0176)
Head: Primary Education	0.107** (0.0468)	0.0579 (0.0390)	0.102** (0.0470)	0.0434 (0.0388)	0.102** (0.0471)	0.0466 (0.0385)
Head: Middle School Education	0.322*** (0.0693)	0.169*** (0.0451)	0.320*** (0.0694)	0.154*** (0.0438)	0.320*** (0.0694)	0.160*** (0.0438)
Head: Secondary Education	0.407*** (0.0683)	0.282*** (0.0521)	0.406*** (0.0685)	0.266*** (0.0506)	0.407*** (0.0684)	0.268*** (0.0504)
Head: Tertiary Education	0.840*** (0.0934)	0.548*** (0.0591)	0.838*** (0.0940)	0.527*** (0.0582)	0.840*** (0.0944)	0.530*** (0.0581)
Age of Head	0.0146** (0.00685)	0.0305*** (0.00637)	0.0161** (0.00701)	0.0326*** (0.00620)	0.0162** (0.00703)	0.0337*** (0.00617)
Age Sq.	-0.000168*** (6.14e-05)	-0.000297*** (5.81e-05)	-0.000176*** (6.24e-05)	-0.000309*** (5.67e-05)	-0.000177*** (6.26e-05)	-0.000322*** (5.65e-05)
Ln(Land)	0.127*** (0.0126)	0.109*** (0.0154)	0.127*** (0.0126)	0.107*** (0.0153)	0.127*** (0.0125)	0.104*** (0.0154)

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Table 2b: continued

Non-Farm Sector	0.0112 (0.0283)	0.0546** (0.0229)	0.0168 (0.0278)	0.0648*** (0.0237)	0.0173 (0.0279)	0.0620*** (0.0231)
Crops Sector	-0.112** (0.0457)	-0.276*** (0.0605)	-0.114** (0.0457)	-0.268*** (0.0603)	-0.113** (0.0457)	-0.274*** (0.0607)
Livestock Sector	-0.1000** (0.0405)	-0.0364 (0.0453)	-0.0980** (0.0401)	-0.0368 (0.0451)	-0.0980** (0.0401)	-0.0411 (0.0449)
Constant	7.997*** (0.197)	7.617*** (0.192)	7.942*** (0.201)	7.559*** (0.191)	7.947*** (0.202)	7.559*** (0.189)
Observations	2,121	2,144	2,121	2,144	2,121	2,144
Adjusted R-squared	0.242	0.342	0.243	0.349	0.243	0.352
FHH joint significance test	5.062	1.173	4.572	8.624	3.083	8.924
FHH joint significance p-value	0.027	0.281	0.012	0.000	0.031	0.000

Results weighted; Robust standard errors in parentheses

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

Outcome: log of Consumption per day per Adult Equivalent (World Bank Scale) with Economies of Scale (0.8)

Reference group for Educational Attainment: No Education

Income sector dummies are not exclusive (no reference group)

Village dummies not reported

Table 3a: Prevalence of shock exposure by country (in percent; population weighted) – wave 1

		Any Shock											No Shock				
Thailand		32.4											67.6				
Vietnam		57.25											42.75				
		Income Shock							Health Shock				Social Shock				
Thailand		21.65							9.87				4.15				
Vietnam		39.06							23.78				3.91				
		Market Shock			Agricultural Supply												
Thailand		6.07			17.19												
Vietnam		3.05			37.26												
		Credit Problem	Price Shock	Job / Business Loss	Remittance Drop	Livestock Disease	Crop Pest	Storm / Rain / Cold	Drought	Birth	Illness	Accident	Death	Social Obligation	Migrated Hh Member	Crime / Law / Jail	House Damage
Thailand		2.89	1.75	1.66	0.27	0.32	2.35	5.45	9.95	0.23	6.41	0.32	3.09	1.33	0.42	1.25	1.39
Vietnam		0.40	2.08	0.58	0.04	8.21	10.27	16.23	8.96	1.95	18.49	2.23	2.05	0.82	1.13	1.47	0.5

Note: Values are population weighted

Table 3b: Prevalence of shock exposure by country (in percent; population weighted) – wave 2

		Any Shock												No Shock			
		Income Shock						Health Shock						Social Shock			
		Market Shock			Agricultural Supply												
		Credit Problem	Price Shock	Job / Business Loss	Remittance Drop	Livestock Disease	Crop Pest	Storm / Rain / Cold	Drought	Birth	Illness	Accident	Death	Social Obligation	Migrated Hh Member	Crime / Law / Jail	House Damage
Thailand		60.98												39.02			
Vietnam		72.48												27.52			
Thailand		46.54						23.57						10.89			
Vietnam		60.51						24.68						8.65			
Thailand		19.38			38.75												
Vietnam		2.3			59.49												
Thailand		2.26	14.29	3.26	1.08	1.27	11.28	13.7	23.53	1.37	17.48	4.53	2.07	4.48	0.62	4.76	1.79
Vietnam		0.1	1.51	0.73	0.06	10.85	12.4	46.3	6.27	2.17	19.57	2.8	2.09	4.26	1.43	2.2	1.42

Note: Values are population weighted

Table 4: Correlates of shock exposure

Outcome	Any Shock					
	(1)	(2)	(3)	(4)	(5)	(6)
	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	0.0125 (0.0272)	0.0123 (0.0335)				
De Facto FHH			0.0167 (0.0556)	0.0319 (0.0608)		
De Jure FHH			0.0114 (0.0295)	0.00802 (0.0370)		
FHH, absent husband					0.0179 (0.0556)	0.0323 (0.0607)
FHH, widow					0.00463 (0.0336)	0.00206 (0.0414)
FHH, single					0.0431 (0.0689)	0.0249 (0.0626)
HH Size (Adult Equivalents)	0.0344** (0.0161)	0.0163 (0.0143)	0.0344** (0.0162)	0.0162 (0.0143)	0.0349** (0.0163)	0.0164 (0.0143)
Dep. Ratio	-0.00219 (0.0165)	0.0154 (0.0156)	-0.00235 (0.0165)	0.0150 (0.0155)	-0.00240 (0.0165)	0.0150 (0.0155)
Head: Primary Education	0.0155 (0.0362)	0.0181 (0.0398)	0.0154 (0.0356)	0.0170 (0.0402)	0.0151 (0.0356)	0.0166 (0.0402)
Head: Middle School Education	-0.0347 (0.0588)	-0.0238 (0.0378)	-0.0348 (0.0588)	-0.0249 (0.0379)	-0.0342 (0.0590)	-0.0253 (0.0378)
Head: Secondary Education	-0.0688 (0.0641)	-0.0125 (0.0445)	-0.0688 (0.0642)	-0.0137 (0.0447)	-0.0698 (0.0639)	-0.0139 (0.0446)
Head: Tertiary Education	-0.225*** (0.0822)	-0.101 (0.0679)	-0.225*** (0.0818)	-0.103 (0.0679)	-0.226*** (0.0817)	-0.103 (0.0679)
Age of Head	0.00702 (0.00606)	-0.00145 (0.00602)	0.00708 (0.00599)	-0.00135 (0.00605)	0.00704 (0.00600)	-0.00143 (0.00602)
Age Sq.	-6.68e-05 (5.43e-05)	1.44e-05 (5.71e-05)	-6.71e-05 (5.39e-05)	1.39e-05 (5.72e-05)	-6.61e-05 (5.41e-05)	1.50e-05 (5.70e-05)
Ln(Land)	0.0264** (0.0106)	0.0413*** (0.0126)	0.0265** (0.0106)	0.0412*** (0.0126)	0.0266** (0.0106)	0.0412*** (0.0126)

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Table 4: continued

Non-Farm Sector	0.00964 (0.0238)	-0.0158 (0.0235)	0.00991 (0.0239)	-0.0152 (0.0235)	0.0101 (0.0239)	-0.0149 (0.0235)
Crops Sector	0.0434 (0.0376)	0.157*** (0.0426)	0.0433 (0.0376)	0.158*** (0.0427)	0.0435 (0.0376)	0.158*** (0.0426)
Livestock Sector	-0.00723 (0.0280)	0.0314 (0.0299)	-0.00723 (0.0280)	0.0313 (0.0299)	-0.00695 (0.0281)	0.0319 (0.0296)
Observations	2,116	2,122	2,116	2,122	2,116	2,122
Pseudo R2	0.044	0.214	0.044	0.214	0.044	0.215
Model Wald Chi2	123.188	505.016	123.195	505.019	123.463	505.030
Model p-val	0.000	0.000	0.000	0.000	0.000	0.000
FHHjoint chi2	0.212	0.134	0.217	0.296	0.492	0.459
FHH pval	0.645	0.714	0.897	0.863	0.921	0.928

Results weighted; marginal effects reported; robust standard errors in parentheses

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Reference group for Educational Attainment: No Education

Constant and District Dummies not reported

Chi2 Test from unweighted model

Table 5: Correlates of perceived shock severity

Outcome	Perceived Severity (from 0 = least severe to 1 = most severe)					
	(1)	(2)	(3)	(4)	(5)	(6)
	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	-0.00262 (0.0209)	-0.0521** (0.0213)				
De Facto FHH			0.0506 (0.0398)	-0.0682* (0.0397)		
De Jure FHH			-0.0168 (0.0228)	-0.0475* (0.0244)		
FHH, absent husband					0.0506 (0.0397)	-0.0670* (0.0399)
FHH, widow					-0.0166 (0.0246)	-0.0645** (0.0259)
FHH, single					-0.0179 (0.0576)	0.0167 (0.0484)
Market Shock	-0.286*** (0.0661)	-0.243*** (0.0708)	-0.286*** (0.0664)	-0.243*** (0.0708)	-0.286*** (0.0677)	-0.246*** (0.0712)
Agricultural Supply Shock	-0.119 (0.0896)	-0.239*** (0.0262)	-0.117 (0.0899)	-0.239*** (0.0261)	-0.117 (0.0908)	-0.238*** (0.0265)
Health Shock	-0.221*** (0.0606)	-0.198*** (0.0320)	-0.219*** (0.0609)	-0.198*** (0.0321)	-0.219*** (0.0613)	-0.199*** (0.0321)
Social Shock	-0.163* (0.0834)	-0.0202 (0.0664)	-0.161* (0.0836)	-0.0201 (0.0663)	-0.161* (0.0836)	-0.0218 (0.0661)
HH Size (Adult Equivalents)	0.0126 (0.0104)	0.00522 (0.0115)	0.0127 (0.0104)	0.00525 (0.0115)	0.0127 (0.0102)	0.00615 (0.0115)
Dep. Ratio	-0.0175 (0.0108)	0.00519 (0.0108)	-0.0192* (0.0109)	0.00564 (0.0109)	-0.0192* (0.0109)	0.00530 (0.0109)
Head: Primary Education	0.000995 (0.0231)	0.00909 (0.0235)	-0.000865 (0.0231)	0.0104 (0.0237)	-0.000846 (0.0231)	0.0110 (0.0237)
Head: Middle School Education	0.0465 (0.0399)	0.00158 (0.0234)	0.0463 (0.0397)	0.00313 (0.0233)	0.0463 (0.0397)	0.00357 (0.0235)
Head: Secondary Education	-0.0664 (0.0505)	-0.0211 (0.0282)	-0.0666 (0.0508)	-0.0198 (0.0282)	-0.0666 (0.0509)	-0.0186 (0.0281)
Head: Tertiary Education	0.0329 (0.0754)	-0.0262 (0.0349)	0.0341 (0.0752)	-0.0247 (0.0347)	0.0342 (0.0749)	-0.0236 (0.0345)

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Table 5: continued

Age of Head	0.00485 (0.00399)	0.00360 (0.00371)	0.00552 (0.00400)	0.00342 (0.00370)	0.00553 (0.00400)	0.00306 (0.00373)
Age Sq.	-3.71e-05 (3.41e-05)	-3.32e-05 (3.48e-05)	-4.06e-05 (3.40e-05)	-3.21e-05 (3.47e-05)	-4.06e-05 (3.41e-05)	-2.75e-05 (3.48e-05)
Ln(Land)	-0.00633 (0.00744)	0.000140 (0.00922)	-0.00611 (0.00751)	0.000394 (0.00923)	-0.00611 (0.00751)	0.000846 (0.00927)
Non-Farm Sector	-0.0374** (0.0176)	-0.0113 (0.0152)	-0.0344* (0.0177)	-0.0122 (0.0153)	-0.0344* (0.0178)	-0.0119 (0.0154)
Crops Sector	0.0695** (0.0304)	0.0336 (0.0303)	0.0680** (0.0302)	0.0335 (0.0303)	0.0679** (0.0306)	0.0328 (0.0299)
Livestock Sector	-0.00262 (0.0187)	-0.0105 (0.0221)	-0.000762 (0.0188)	-0.0104 (0.0221)	-0.000767 (0.0189)	-0.00926 (0.0218)
Constant	0.633*** (0.123)	0.795*** (0.110)	0.606*** (0.123)	0.799*** (0.111)	0.606*** (0.123)	0.804*** (0.111)
Observations	1,290	1,564	1,290	1,564	1,290	1,564
Adj R2	0.137	0.251	0.139	0.251	0.138	0.251
Model F-Test	2.628	5.161	2.634	5.118	2.611	5.099
FHHjoint F-Test	0.016	5.968	1.202	3.211	0.807	3.004
FHH pval	0.901	0.016	0.304	0.044	0.493	0.034

Results weighted; robust standard errors in parentheses

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Reference group for Educational Attainment: Primary Education

Village Dummies not reported

Adj R2 from unweighted model

Table 6: Correlates of shock severity (asset loss)

Outcome	Asset Loss measured in ln(USD PPP)					
	Marginal effects					
	(1)	(2)	(3)	(4)	(5)	(6)
Tobit	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	-0.514 (1.291)	1.101* (0.657)				
De Facto FHH			0.126 (2.363)	2.724** (1.072)		
De Jure FHH			-0.709 (1.533)	0.563 (0.822)		
FHH, absent husband					0.0588 (2.364)	2.737** (1.072)
FHH, widow					0.0673 (1.648)	0.474 (0.983)
FHH, single					-5.769 (4.309)	0.894 (1.227)
Market Shock	8.552*** (2.858)	1.337 (2.736)	8.536*** (2.870)	1.333 (2.753)	9.093*** (2.847)	1.347 (2.761)
Agricultural Supply Shock	-4.192 (5.189)	-0.203 (0.685)	-4.154 (5.175)	-0.165 (0.686)	-3.727 (5.448)	-0.155 (0.688)
Health Shock	-0.385 (3.053)	1.903** (0.968)	-0.359 (3.066)	1.956** (0.959)	-0.316 (3.046)	1.947** (0.961)
Social Shock	7.966*** (2.538)	2.397 (2.757)	7.948*** (2.547)	2.346 (2.767)	7.820*** (2.551)	2.350 (2.765)
HH Size (Adult Equivalents)	1.023* (0.529)	0.0174 (0.390)	1.036** (0.528)	0.0211 (0.388)	1.005* (0.530)	0.0275 (0.385)
Dep. Ratio	-0.718 (0.643)	-0.364 (0.506)	-0.746 (0.642)	-0.427 (0.500)	-0.756 (0.644)	-0.428 (0.500)
Head: Primary Education	0.764 (1.712)	0.0424 (0.916)	0.717 (1.727)	-0.139 (0.936)	0.739 (1.731)	-0.148 (0.936)
Head: Middle School Education	-4.228 (3.020)	1.249 (0.910)	-4.239 (3.023)	1.035 (0.933)	-4.325 (3.016)	1.027 (0.931)
Head: Secondary Education	-3.863 (3.399)	-0.780 (1.114)	-3.857 (3.394)	-0.994 (1.118)	-3.773 (3.382)	-1.001 (1.115)
Head: Tertiary Education	-6.244 (4.225)	-3.426** (1.585)	-6.268 (4.233)	-3.693** (1.592)	-5.949 (4.201)	-3.698** (1.593)

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Table 6: continued

Age of Head	0.218 (0.260)	0.127 (0.150)	0.227 (0.262)	0.156 (0.149)	0.231 (0.261)	0.155 (0.149)
Age Sq.	-0.00212 (0.00230)	-0.00150 (0.00138)	-0.00218 (0.00231)	-0.00172 (0.00137)	-0.00230 (0.00230)	-0.00170 (0.00137)
Ln(Land)	0.0489 (0.457)	0.300 (0.344)	0.0542 (0.460)	0.266 (0.340)	0.0709 (0.458)	0.269 (0.340)
Non-Farm Sector	-1.633 (1.141)	0.467 (0.607)	-1.598 (1.146)	0.551 (0.602)	-1.586 (1.143)	0.557 (0.600)
Crops Sector	2.805* (1.693)	0.117 (1.176)	2.767 (1.707)	0.132 (1.187)	2.622 (1.679)	0.125 (1.182)
Livestock Sector	0.983 (1.185)	-0.286 (0.848)	0.988 (1.186)	-0.244 (0.841)	1.004 (1.185)	-0.249 (0.841)
Observations	2,116	2,139	2,116	2,139	2,116	2,139
Pseudo R2	0.078	0.157	0.078	0.158	0.079	0.158
Model Chi2	202.488	616.444	202.573	618.480	204.953	618.577
FHHjoint Chi2	0.159	2.814	0.108	3.573	0.600	2.516
FHH pval	0.690	0.094	0.898	0.028	0.615	0.057

Results weighted; marginal effects reported; robust standard errors in parentheses

Significance levels: *** p<0.01, ** p<0.05, * p<0.1

Reference group for Educational Attainment: Primary Education

Constant and Village Dummies not reported

Adj R2 from unweighted model

Table 7: Degree of consumption smoothing

Outcome	Consumption Change											
	(1)		(2)		(3)		(4)		(5)		(6)	
	Female Head		De Facto vs. De Jure		FHH Subgroups							
OLS	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Income Change	0.00567***	0.00117	0.00569***	0.00117	0.00566***	0.00118						
	(0.00133)	(0.00135)	(0.00136)	(0.00135)	(0.00138)	(0.00135)						
Female Head	-0.0501	0.0402										
	(0.0640)	(0.0609)										
Female Head * Income Change	0.222***	0.00312*										
	(0.0789)	(0.00167)										
De Facto FHH			0.107	0.143								
			(0.160)	(0.131)								
De Jure FHH			-0.0721	0.0154								
			(0.0681)	(0.0667)								
De Facto FHH * Income Change			0.425**	0.000988								
			(0.170)	(0.0181)								
De Jure FHH * Income Change			0.204**	0.00320*								
			(0.0857)	(0.00168)								
FHH, absent husband					0.103	0.144						
					(0.161)	(0.131)						
FHH, widow					-0.116	0.0152						
					(0.0810)	(0.0774)						
FHH, single					0.121	-0.0189						
					(0.142)	(0.115)						
FHH, absent husband * Income Change					0.423**	0.00111						
					(0.171)	(0.0179)						
FHH, widow * Income Change					0.181*	0.00307*						
					(0.0969)	(0.00169)						
FHH, single * Income Change					0.344*	0.133						
					(0.203)	(0.0951)						
Constant	0.669***	0.420***	0.677***	0.423***	0.665***	0.415***						
	(0.0948)	(0.147)	(0.0951)	(0.145)	(0.121)	(0.154)						
Observations	781	982	781	982	781	982						
Adj R2	0.047	0.064	0.046	0.063	0.047	0.062						
FHH Waldtest	4.677	2.135	3.996	1.410	2.892	1.227						
FHH pval	0.010	0.121	0.004	0.232	0.010	0.294						

Results weighted; Robust standard errors in parentheses

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

Village Dummies not reported

Table 8a: Correlates of vulnerability to poverty – wave 1

Outcome	Vulnerability to Poverty					
	(1)	(2)	(3)	(4)	(5)	(6)
	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	-0.00701*	-0.000700				
	(0.00378)	(0.00928)				
De Facto FHH			-0.0139***	-0.0289***		
			(0.00465)	(0.00944)		
De Jure FHH			-0.00506	0.00680		
			(0.00429)	(0.0108)		
FHH, absent husband					-0.0140***	-0.0285***
					(0.00466)	(0.00947)
FHH, widow					-0.00444	0.00271
					(0.00456)	(0.0115)
FHH, single					-0.00785	0.0196
					(0.00747)	(0.0185)
HH Size (Adult Equivalents)	0.00844***	0.0202***	0.00835***	0.0203***	0.00831***	0.0205***
	(0.00243)	(0.00473)	(0.00242)	(0.00474)	(0.00243)	(0.00474)
Dep. Ratio	0.00552**	0.00885**	0.00580**	0.00963**	0.00581**	0.00960**
	(0.00234)	(0.00412)	(0.00238)	(0.00414)	(0.00238)	(0.00413)
Head: Primary Education	-0.00955	-0.0126	-0.00924	-0.0106	-0.00921	-0.0107
	(0.00639)	(0.00954)	(0.00644)	(0.00955)	(0.00643)	(0.00953)
Head: Middle School Education	-0.0208***	-0.0320***	-0.0205***	-0.0298***	-0.0205***	-0.0299***
	(0.00760)	(0.0101)	(0.00764)	(0.0102)	(0.00764)	(0.0102)
Head: Secondary Education	-0.0160	-0.0390***	-0.0160	-0.0367***	-0.0159	-0.0367***
	(0.0106)	(0.0111)	(0.0106)	(0.0112)	(0.0106)	(0.0112)
Head: Tertiary Education	-0.0199***	-0.0514***	-0.0196***	-0.0482***	-0.0194***	-0.0480***
	(0.00657)	(0.0104)	(0.00660)	(0.0107)	(0.00657)	(0.0107)
Age of Head	0.000330	-0.00367**	0.000236	-0.00393**	0.000239	-0.00399**
	(0.000692)	(0.00183)	(0.000696)	(0.00183)	(0.000696)	(0.00184)
Age Sq.	-1.21e-06	3.65e-05**	-7.18e-07	3.83e-05**	-8.03e-07	3.91e-05**
	(6.24e-06)	(1.80e-05)	(6.24e-06)	(1.80e-05)	(6.25e-06)	(1.81e-05)
Ln(Land)	-0.00648***	-0.0143***	-0.00654***	-0.0140***	-0.00655***	-0.0139***
	(0.00156)	(0.00279)	(0.00156)	(0.00280)	(0.00156)	(0.00280)

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Table 8a: continued

Non-Farm Sector	-0.000327 (0.00285)	-0.0145** (0.00657)	-0.000757 (0.00291)	-0.0158** (0.00671)	-0.000764 (0.00291)	-0.0156** (0.00674)
Crops Sector	0.000479 (0.00400)	0.0373*** (0.00877)	0.000633 (0.00398)	0.0367*** (0.00883)	0.000606 (0.00400)	0.0367*** (0.00879)
Livestock Sector	-0.00442 (0.00390)	0.00891 (0.00674)	-0.00444 (0.00390)	0.00917 (0.00673)	-0.00446 (0.00390)	0.00956 (0.00665)
Constant	-0.00760 (0.0202)	0.0117 (0.0414)	-0.00425 (0.0201)	0.0172 (0.0415)	-0.00394 (0.0202)	0.0180 (0.0416)
Observations	2,172	2,189	2,172	2,189	2,172	2,189
Adj. R2	0.049	0.151	0.049	0.153	0.049	0.153
FHH Waldtest	3.434	0.006	4.489	5.506	3.012	3.886
FHH pval	0.067	0.940	0.013	0.005	0.033	0.011

Results weighted; Robust standard errors in parentheses

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

Reference group for Educational Attainment: No Education

Income sector dummies are not exclusive (no reference group)

Village Dummies not reported

Table 8b: Correlates of vulnerability to poverty – wave 2

Outcome	Vulnerability to Poverty					
	(1)	(2)	(3)	(4)	(5)	(6)
	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	0.00175 (0.00313)	0.00417 (0.00498)				
De Facto FHH			-0.00461 (0.00295)	-0.0207*** (0.00735)		
De Jure FHH			0.00338 (0.00379)	0.0110* (0.00576)		
FHH, absent husband					-0.00473 (0.00295)	-0.0206*** (0.00738)
FHH, widow					0.00469 (0.00422)	0.0106* (0.00632)
FHH, single					-0.00314 (0.00763)	0.0125 (0.0108)
HH Size (Adult Equivalents)	0.00740*** (0.00209)	0.0161*** (0.00276)	0.00731*** (0.00208)	0.0163*** (0.00277)	0.00721*** (0.00207)	0.0163*** (0.00277)
Dep. Ratio	0.00412** (0.00199)	0.0152*** (0.00363)	0.00428** (0.00201)	0.0158*** (0.00365)	0.00427** (0.00201)	0.0157*** (0.00364)
Head: Primary Education	-0.00397 (0.00403)	-0.00440 (0.00689)	-0.00372 (0.00406)	-0.00288 (0.00686)	-0.00371 (0.00406)	-0.00291 (0.00687)
Head: Middle School Education	-0.00806 (0.00599)	-0.0130* (0.00719)	-0.00793 (0.00596)	-0.0115 (0.00713)	-0.00790 (0.00599)	-0.0116 (0.00715)
Head: Secondary Education	-0.00157 (0.00942)	-0.0171** (0.00677)	-0.00151 (0.00941)	-0.0154** (0.00668)	-0.00137 (0.00941)	-0.0154** (0.00668)
Head: Tertiary Education	-0.0118** (0.00541)	-0.0277*** (0.00816)	-0.0117** (0.00541)	-0.0255*** (0.00812)	-0.0115** (0.00533)	-0.0255*** (0.00813)
Age of Head	0.00115* (0.000592)	-0.00180 (0.00120)	0.00106* (0.000595)	-0.00202* (0.00121)	0.00106* (0.000592)	-0.00203* (0.00122)
Age Sq.	-7.58e-06 (5.08e-06)	1.88e-05* (1.10e-05)	-7.10e-06 (5.08e-06)	2.01e-05* (1.11e-05)	-7.25e-06 (5.04e-06)	2.02e-05* (1.11e-05)
Ln(Land)	-0.00329*** (0.00110)	-0.00790*** (0.00197)	-0.00328*** (0.00109)	-0.00767*** (0.00198)	-0.00332*** (0.00109)	-0.00764*** (0.00200)

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Table 8b: continued

Non-Farm Sector	0.00262 (0.00264)	-0.0138*** (0.00392)	0.00229 (0.00265)	-0.0148*** (0.00395)	0.00236 (0.00265)	-0.0148*** (0.00396)
Crops Sector	-0.00164 (0.00367)	0.0226*** (0.00748)	-0.00150 (0.00369)	0.0217*** (0.00747)	-0.00143 (0.00368)	0.0218*** (0.00742)
Livestock Sector	0.000744 (0.00364)	-0.00777 (0.00613)	0.000632 (0.00364)	-0.00772 (0.00611)	0.000634 (0.00365)	-0.00768 (0.00616)
Constant	-0.0596*** (0.0202)	0.00414 (0.0349)	-0.0564*** (0.0201)	0.0102 (0.0353)	-0.0557*** (0.0201)	0.0102 (0.0353)
Observations	2,121	2,144	2,121	2,144	2,121	2,144
Adj. R2	0.034	0.144	0.034	0.147	0.034	0.147
FHH Waldtest	0.311	0.701	1.748	6.507	1.380	4.312
FHH pval	0.578	0.405	0.179	0.002	0.253	0.007

Results weighted; Robust standard errors in parentheses

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

Reference group for Educational Attainment: No Education

Income sector dummies are not exclusive (no reference group)

Village Dummies not reported

Table 9: Correlates of perceived vulnerability to downside risk

Outcome	Perceived vulnerability to downside risk					
	(1)	(2)	(3)	(4)	(5)	(6)
	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	0.00276 (0.00285)	-0.00125 (0.00149)				
De Facto FHH			0.00757 (0.00580)	-0.00494* (0.00294)		
De Jure FHH			0.00152 (0.00308)	-0.000225 (0.00191)		
FHH, absent husband					0.00744 (0.00581)	-0.00493* (0.00296)
FHH, widow					0.00301 (0.00351)	-0.000315 (0.00215)
FHH, single					-0.00590 (0.00435)	4.58e-05 (0.00292)
HH Size (Adult Equivalents)	0.000765 (0.00190)	-0.000659 (0.000627)	0.000829 (0.00190)	-0.000631 (0.000625)	0.000717 (0.00191)	-0.000628 (0.000627)
Dep. Ratio	0.00213 (0.00171)	0.00113 (0.000740)	0.00201 (0.00171)	0.00121 (0.000758)	0.00200 (0.00171)	0.00121 (0.000768)
Head: No Education	0.00430 (0.00476)	0.00266* (0.00156)	0.00411 (0.00476)	0.00288* (0.00161)	0.00412 (0.00475)	0.00288* (0.00162)
Head: Middle School Education	-0.00124 (0.00662)	0.00255* (0.00142)	-0.00133 (0.00662)	0.00277* (0.00143)	-0.00130 (0.00661)	0.00276* (0.00142)
Head: Secondary Education	-0.00281 (0.00575)	-0.000185 (0.00177)	-0.00286 (0.00575)	7.43e-05 (0.00181)	-0.00270 (0.00574)	6.95e-05 (0.00180)
Head: Tertiary Education	-0.00422 (0.00646)	0.000678 (0.00248)	-0.00429 (0.00643)	0.00100 (0.00251)	-0.00404 (0.00640)	0.000998 (0.00251)
Age of Head	-0.000469 (0.000653)	0.000508** (0.000256)	-0.000403 (0.000655)	0.000475* (0.000253)	-0.000397 (0.000654)	0.000473* (0.000256)
Age Sq.	3.46e-06 (5.86e-06)	-5.90e-06** (2.36e-06)	3.09e-06 (5.88e-06)	-5.72e-06** (2.33e-06)	2.92e-06 (5.87e-06)	-5.70e-06** (2.38e-06)
Ln(Land)	0.00164* (0.000854)	0.000561 (0.000476)	0.00163* (0.000853)	0.000596 (0.000470)	0.00159* (0.000857)	0.000600 (0.000474)

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Table 9: continued

Non-Farm Sector	0.00194 (0.00241)	-0.000591 (0.00141)	0.00218 (0.00243)	-0.000749 (0.00147)	0.00226 (0.00243)	-0.000744 (0.00148)
Crops Sector	0.00974*** (0.00266)	0.00294 (0.00178)	0.00964*** (0.00267)	0.00281 (0.00177)	0.00971*** (0.00268)	0.00282 (0.00176)
Livestock Sector	0.00342 (0.00215)	-0.000364 (0.00149)	0.00351 (0.00214)	-0.000357 (0.00149)	0.00351 (0.00214)	-0.000349 (0.00150)
Constant	0.00608 (0.0177)	-0.00700 (0.00618)	0.00367 (0.0177)	-0.00611 (0.00609)	0.00440 (0.0177)	-0.00611 (0.00610)
Observations	2,121	2,144	2,121	2,144	2,121	2,144
Adjusted R-squared	0.013	0.082	0.013	0.082	0.014	0.082
FHH joint significance test	0.937	0.702	0.903	1.513	1.615	1.044
FHH joint significance p-value	0.335	0.404	0.409	0.225	0.190	0.377

Results weighted; Robust standard errors in parentheses

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

Reference group for Educational Attainment: No Education

Income sector dummies are not exclusive (no reference group)

Village dummies not reported

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Appendix A: Summary statistics – wave 1

	Variable	Unit	Male Headed		Female Headed		De Jure FHH		De Facto FHH		Widow		Single	
			Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
	ln(Cons per Capita)	USD PPP	7.085	6.773	7.109	6.771	7.058	6.726	7.310	6.968	7.017	6.734	7.260	6.698
	ln(Cons per Adult)	USD PPP	7.550	7.270	7.597	7.232	7.542	7.173	7.813	7.485	7.512	7.180	7.688	7.151
HH Composition	HH Size	members	4.068	4.516	3.554	3.098	3.643	3.036	3.206	3.370	3.805	3.092	2.852	2.858
	HH Size (adult equivalents)	members	2.470	2.676	2.095	1.878	2.144	1.856	1.906	1.975	2.219	1.888	1.775	1.756
	Dependency Ratio	ratio	1.558	1.666	1.724	1.657	1.614	1.479	2.152	2.435	1.638	1.445	1.497	1.588
	Children aged up to 1	members	0.089	0.089	0.093	0.057	0.089	0.050	0.108	0.091	0.101	0.054	0.033	0.037
	Children aged up to 2	members	0.161	0.165	0.164	0.112	0.142	0.084	0.250	0.232	0.158	0.095	0.066	0.051
	Children aged up to 3	members	0.223	0.255	0.226	0.156	0.195	0.123	0.347	0.303	0.221	0.139	0.066	0.071
	Children aged up to 4	members	0.283	0.335	0.281	0.220	0.248	0.184	0.412	0.374	0.278	0.194	0.098	0.153
	Children aged up to 5	members	0.353	0.414	0.335	0.271	0.295	0.231	0.488	0.446	0.325	0.249	0.148	0.171
Education	No Education of HH Head	%	8.1%	10.4%	21.9%	30.7%	25.0%	37.0%	9.8%	3.4%	26.5%	38.2%	18.0%	33.1%
	Primary Education	%	80.0%	22.7%	72.1%	24.5%	70.8%	25.2%	77.2%	21.1%	70.8%	26.5%	70.6%	21.3%
	Middle School Edu	%	5.1%	45.2%	3.1%	35.4%	1.7%	29.6%	8.7%	60.7%	1.7%	27.1%	1.6%	37.5%
	Secondary Education	%	4.2%	16.7%	1.3%	7.3%	1.4%	6.5%	1.1%	11.0%	0.7%	6.0%	4.9%	8.2%
	Tertiary Education	%	2.7%	4.9%	1.6%	2.1%	1.1%	1.7%	3.3%	3.8%	0.3%	2.3%	4.9%	0.0%
	HH head can read	%	92.9%	91.1%	79.4%	73.8%	76.1%	68.6%	92.4%	96.6%	74.5%	66.9%	83.7%	74.2%
	edu_school	%	95.5%	91.2%	87.1%	71.4%	85.0%	65.6%	95.6%	96.8%	82.9%	65.0%	95.1%	67.3%
	Age of HH head	years	53	47	59	54	64	58	41	38	66	61	53	48
	Age of HH head, squared	years sq	2999	2393	3718	3146	4219	3514	1765	1538	4479	3842	2946	2472
Income and Remittances	ln(Land size)	ln(hectar)	0.570	-0.842	0.035	-1.588	0.103	-1.647	-0.229	-1.328	0.206	-1.551	-0.403	-1.953
	No of Income Sources	amount	3.71	3.16	3.17	2.66	3.24	2.70	2.89	2.47	3.29	2.80	2.98	2.38
	Remittance Received	%	9.4%	4.5%	8.4%	4.7%	10.0%	5.4%	2.2%	1.8%	10.7%	6.4%	6.5%	2.0%
	Remittance Sent	%	2.8%	6.8%	2.0%	3.6%	1.9%	4.3%	2.2%	0.2%	2.3%	4.0%	0.0%	5.2%
	Remittance Net Recipient	%	9.2%	4.2%	8.4%	4.3%	10.0%	4.9%	2.2%	1.8%	10.7%	5.8%	6.5%	2.0%
	Net remittances per capita	USD PPP	28.09	-11.17	18.98	19.07	22.43	11.50	5.51	52.19	19.88	17.21	34.93	-6.61
Income Sector	Busy in Agriculture	%	95.5%	94.8%	91.8%	86.8%	91.6%	86.5%	92.4%	88.0%	92.6%	87.3%	86.9%	84.0%
	sect_crops	%	85.4%	90.2%	72.2%	79.5%	71.3%	79.4%	76.0%	79.9%	73.1%	82.2%	62.3%	70.6%
	sect_livestock	%	78.1%	77.8%	63.4%	68.9%	64.6%	66.9%	58.7%	77.4%	67.1%	72.7%	52.5%	48.7%
	sect_lstprod	%	40.4%	40.9%	30.8%	35.1%	30.9%	36.7%	30.4%	28.4%	31.5%	39.4%	27.9%	28.0%
	sect_fishing	%	71.2%	29.0%	68.5%	17.5%	69.1%	18.1%	66.2%	14.7%	69.8%	16.4%	65.6%	23.3%
	sect_nonfarm	%	72.7%	64.0%	62.6%	53.9%	66.1%	57.5%	48.9%	38.3%	65.8%	55.9%	67.2%	62.7%
	sect_offfarmempl	%	56.3%	49.4%	49.5%	40.9%	53.8%	43.8%	32.6%	28.3%	53.1%	43.2%	57.3%	45.6%
	sect_selfempl	%	30.0%	23.9%	24.0%	19.5%	24.2%	20.1%	22.8%	16.9%	23.9%	20.0%	26.2%	20.3%
Shocks	income_shockgroup	%	22.3%	39.7%	19.1%	35.3%	19.8%	37.3%	16.3%	26.6%	20.2%	38.6%	18.0%	33.3%
	market_shockgroup	%	6.2%	3.3%	5.5%	1.7%	5.0%	0.8%	7.6%	5.4%	3.7%	0.6%	11.5%	1.7%
	supply_shockgroup	%	17.7%	37.8%	15.1%	34.0%	15.6%	36.9%	13.0%	21.3%	17.2%	38.0%	8.2%	33.3%
	health_shockgroup	%	9.4%	23.1%	11.8%	27.4%	13.4%	27.9%	5.4%	25.2%	13.1%	29.5%	14.7%	22.7%
	social_shockgroup	%	3.8%	3.9%	5.3%	4.1%	5.0%	3.8%	6.5%	5.3%	4.7%	2.7%	6.5%	7.5%
	Households	N	1724	1867	451	323	359	265	92	58	298	202	61	63

Note: Values are population weighted

Appendix B: Summary statistics – wave 2

	Variable	Unit	Male Headed		Female Headed		De Jure FHH		De Facto FHH		Widow		Single	
			Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
	ln(Cons per Capita)	USD PPP	7.278	6.983	7.260	6.988	7.209	6.946	7.483	7.157	7.191	6.968	7.306	6.878
	ln(Cons per Adult)	USD PPP	7.748	7.477	7.760	7.449	7.709	7.397	7.984	7.659	7.700	7.417	7.759	7.333
HH Composition	HH Size	members	4.076	4.538	3.685	3.101	3.777	3.020	3.283	3.429	3.913	3.039	3.038	2.962
	HH Size (adult equivalents)	members	2.468	2.697	2.150	1.874	2.197	1.836	1.941	2.029	2.257	1.851	1.870	1.791
	Dependency Ratio	ratio	1.554	1.618	1.754	1.603	1.693	1.429	2.021	2.310	1.730	1.348	1.493	1.683
	Children aged up to 1	members	0.075	0.079	0.081	0.076	0.076	0.074	0.102	0.081	0.083	0.065	0.038	0.102
	Children aged up to 2	members	0.129	0.136	0.147	0.086	0.146	0.083	0.153	0.098	0.155	0.076	0.095	0.105
	Children aged up to 3	members	0.203	0.211	0.219	0.133	0.213	0.117	0.243	0.197	0.232	0.106	0.114	0.154
	Children aged up to 4	members	0.276	0.297	0.288	0.173	0.269	0.157	0.370	0.237	0.294	0.157	0.133	0.156
	Children aged up to 5	members	0.340	0.376	0.359	0.240	0.336	0.219	0.461	0.325	0.367	0.218	0.170	0.222
Education	No Education of HH Head	%	8.0%	12.3%	19.9%	27.3%	22.7%	31.6%	7.7%	9.9%	23.5%	35.0%	18.8%	21.1%
	Primary Education	%	79.4%	22.8%	74.6%	26.7%	73.2%	28.1%	80.8%	20.9%	74.1%	30.2%	68.0%	21.5%
	Middle School Edu	%	5.2%	43.5%	2.4%	35.6%	1.5%	31.3%	6.4%	53.4%	1.0%	26.1%	3.8%	47.5%
	Secondary Education	%	4.8%	15.7%	1.9%	7.6%	1.8%	6.5%	2.6%	12.3%	1.0%	5.9%	5.7%	8.2%
	Tertiary Education	%	2.5%	5.7%	1.2%	2.7%	0.9%	2.5%	2.6%	3.5%	0.3%	2.8%	3.7%	1.7%
	HH head can read	%	93.1%	89.3%	80.8%	74.4%	77.8%	70.6%	93.6%	90.1%	76.9%	67.3%	83.1%	80.7%
	edu_school	%	95.4%	89.2%	88.1%	73.1%	86.0%	68.5%	97.4%	91.8%	84.8%	65.1%	92.5%	79.2%
Income and Remittances	Age of HH head	years	54	48	60	55	64	59	43	39	66	62	54	48
	Age of HH head, squared	years sq	3092	2507	3850	3243	4286	3658	1939	1551	4514	4035	3043	2476
	ln(Land size)	ln(hectar)	0.669	-0.749	0.220	-1.556	0.212	-1.578	0.256	-1.464	0.264	-1.439	-0.069	-2.013
	No of Income Sources	amount	3.79	3.89	3.44	3.49	3.49	3.55	3.22	3.26	3.51	3.61	3.41	3.37
	Remittance Received	%	9.6%	7.8%	9.5%	9.7%	10.2%	10.1%	6.4%	8.0%	11.0%	10.0%	5.7%	10.4%
	Remittance Sent	%	4.0%	13.2%	4.8%	7.1%	5.0%	6.3%	3.8%	10.3%	5.2%	6.6%	3.7%	5.4%
	Remittance Net Recipient	%	8.7%	5.4%	9.3%	7.0%	9.9%	6.7%	6.4%	8.0%	10.7%	6.6%	5.7%	7.0%
Net remittances per capita	USD PPP	0.70	-6.30	0.06	0.87	-0.05	1.84	0.54	-3.06	0.00	0.42	-0.31	6.29	
Income Sector	Busy in Agriculture	%	97.5%	97.3%	93.8%	93.2%	93.8%	93.1%	93.6%	93.6%	94.1%	94.6%	92.4%	88.5%
	sect_crops	%	87.4%	92.0%	78.5%	82.8%	77.1%	83.5%	84.6%	79.8%	77.1%	86.7%	77.3%	73.5%
	sect_livestock	%	84.6%	85.9%	78.6%	82.8%	79.8%	82.8%	73.1%	82.6%	80.3%	86.5%	77.3%	71.1%
	sect_1stprod	%	31.3%	55.9%	24.6%	48.8%	24.6%	48.5%	24.4%	49.9%	25.3%	49.9%	20.7%	44.1%
	sect_fishing	%	80.6%	63.7%	78.1%	61.3%	78.4%	62.6%	76.9%	56.2%	79.6%	61.8%	71.7%	65.1%
	sect_nonfarm	%	71.7%	70.8%	63.6%	57.4%	66.7%	59.7%	50.1%	47.7%	65.1%	57.9%	75.4%	65.6%
	sect_offfarmempl	%	56.5%	57.5%	51.7%	39.7%	54.1%	44.5%	41.1%	20.5%	54.0%	43.5%	54.7%	47.4%
sect_selfempl	%	28.8%	26.3%	23.1%	24.1%	24.9%	23.0%	15.4%	28.7%	23.2%	22.4%	34.0%	24.9%	
Shocks	income_shockgroup	%	47.8%	61.5%	41.4%	55.2%	42.4%	54.7%	37.2%	57.4%	42.9%	56.1%	39.6%	50.4%
	market_shockgroup	%	20.1%	2.6%	16.4%	0.7%	16.7%	0.8%	15.4%	0.0%	17.3%	1.1%	13.2%	0.0%
	supply_shockgroup	%	39.9%	60.3%	34.3%	55.2%	34.8%	54.7%	32.0%	57.4%	35.6%	56.1%	30.1%	50.4%
	health_shockgroup	%	22.9%	24.3%	26.2%	26.6%	27.2%	28.2%	21.9%	20.1%	27.7%	29.2%	24.6%	25.3%
	social_shockgroup	%	10.7%	8.6%	11.9%	8.8%	11.4%	8.5%	14.1%	10.0%	11.0%	9.5%	13.2%	5.4%
Households	N	1701	1810	420	334	342	267	78	67	289	204	53	63	

Note: Values are population weighted