Session Number: Second Poster Session
Time: Thursday, August 26, PM

Paper Prepared for the 31st General Conference of
The International Association for Research in Income and Wealth

St. Gallen, Switzerland, August 22-28, 2010

What About the Women?
Female Headship, Poverty and Vulnerability in Thailand and Vietnam

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August 2010

Preliminary and incomplete draft, please do not cite or circulate.

Abstract

This paper investigates whether different types of female-headed households in Thailand and Vietnam are disadvantaged in terms of current consumption, exposure to shocks, consumption smoothing capacities, as well as vulnerability to poverty and downside risk. Using a unique panel data set of over 4000 rural households in both countries, we find that female headed households with an absent husband appear to be better off in terms of current consumption in both countries (suggesting a positive impact of remittances). However, de jure female headed households in Thailand and Vietnam are more exposed to shocks and are less able to insure their consumption against income shocks than other households. In line with this finding de jure female headed households are also more vulnerable to perceived downside risk. Instead, de facto female headed households are less vulnerable to poverty and not worse off in terms of vulnerability to perceived downside risk.

Keywords. Poverty, Gender, Vulnerability to Poverty

Acknowledgements
We would like to thank participants at workshops in Hue and Göttingen, and conference participants in Frankfurt and Hannover for helpful comments and discussion. We would also like to thank the German Research Foundation for financial support for this research program.

1. Introduction

Since the 1990s the poverty status of women is subject to increased attention of economists and policy makers who put the issue 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. This literature has particularly focused on the fate of female-headed households where evidence from the industrialized world appeared to point to higher and more persistent poverty among this group of households, particularly if these female-headed households include children. 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). One purpose of our study it 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 male-headed households in terms of shocks and downside risks little is known about whether this assumption is empirically true as the few empirical studies on vulnerability have not focused on this particular point.

We try to shed more light on this issue by examining gender related determinants of the ex-post and ex-ante exposure to adverse changes in health, agricultural output, market prices and many other aspects of rural life. We empirically 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. More precisely, we investigate the determinants of (i) household consumption, (ii) shock exposure, and (iii) risks faced by household paying special attention to the situation of (certain types of) female-headed households. This study is to our knowledge the first providing a thorough empirical assessment of ex-post shock and ex-ante risk exposure and vulnerability of female-headed households, compared to male-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.[1]

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 dependent 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.[2] 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 but rather that they tend to not apply for loans due to the fact that 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.[3] 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

[1] 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)
[2] For similar evidence regarding Sub-Saharan Africa see, for example, Doss (2005), Udry (1996), and Quisumbing et al. (2004).
[3] 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).

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 al. (1999), Dunlop and Velkoff (1999), as well as Drèze and Sen (1995). Also, there is another resaon 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, i.e. the region which is also studied in this paper – women are paid significantly less than men which 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, as will be discussed in greater detail below female-household heads that are married and whose husband migrated may receive adequate remittances preventing them from experiencing destitution (Buvinic and Gupta, 1997).

Lastly, female farmers in developing countries seem 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 seem to be worse off than their male counterparts, too, although the empirical evidence is not unambiguous. The majority of studies states that female-headed farms are either less likely or as likely as male-headed farms to adopt new production technology (e.g. Chirwa, 2005; Asfaw and

Admassie, 2004; Wier and Knight, 2000). However, Bandiera and Rasul (2006) find that rather the former than the latter adopt new technologies.

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 to range between 60 and 70 percent (e.g. United Nations, 1996; UNDP, 1995).

However, this view was quickly criticized as being unsubstantiated and undifferentiated leading Lipton and Ravallion (1995) to conclude that neither female-headed households are more likely to be poor than male-headed ones nor there is a disproportionate share of women in poor households. Further 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. [4] 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

[4] 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.

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 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).[5]

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 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 the analysis reveals that poverty rates are relatively high among single widows, widows living with unmarried children, and female household heads.

Even if assessments of current levels of poverty are ambiguous it is frequently argued that female-headed households should be the target of policy interventions because they are assumed to transmit poverty to the next generation. This argument draws on female-heads' "double day burden", i.e. the fact that 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).[6] On the other hand, empirical evidence suggests that higher female income shares within a

[5] 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).

[6] 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." For a more detailed discussion about the use of adult-equivalence scales see below.

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 the problems of assessing the poverty status of women in comparison to the one of men have been identified and – as explained above – different solutions have been proposed, illustrating gender related poverty differences remains a challenging task. *Inter alia*, this can be attributed to the fact that income and consumption is typically measured at the household level without providing any information about the relative welfare of females in male-headed households 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 and female-headed households in particular are worse off.[7] One such dimension might be the vulnerability of households, i.e. their exposure to past shocks and future risks, 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; World Bank, 2001b; Narayan et al., 2000).

Vulnerability is a source of deprivation which sometimes is even 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

[7] 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).

of material wealth. Ample qualitative and quantitative evidence suggests that particularly relatively poor households in developing countries spend a lot of time and resources on reducing their exposure to such risk through, among others, risk-sharing arrangements (Dercon, 2005).

Once risks materialize households try to smooth their consumption in an attempt to cope with the adverse event. Respective literature proliferated during the last twenty years and is surveyed, for instance, in Deaton (1997) and Morduch (2004). Often such smoothing efforts are, however, 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 is by no means fixed but rather changes over time. Large proportions of poor households seem to move into and out of poverty over time thus being 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 by, for instance, investing in stable, low-return sources of income instead of in projects whose outcome is more uncertain. This behaviour may perpetuate households' poverty leaving them chronically poor or, in other words, caught in a poverty trap (Chronic Poverty Research Centre, 2008). Moreover, the 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:[8] 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

[8] 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 (2009).

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 the vulnerability of a household equals the difference between the household's utility derived from its certainty-equivalent consumption and the household's expected utility derived from its current consumption. Possible positive future outcomes are allowed to compensate possible 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 income shocks impact significantly on consumption. 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 the 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, and 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.

Similarly to the Calvo-Dercon measure perceived vulnerability to downside risk as proposed by Povel (2009) belongs "the class of measures where vulnerability is a probability weighted average of state-specific 'deprivation indices'..." (Calvo and Dercon, 2005). [9] 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

[9] For a more detailed explanation of the quantification of vulnerability to downside risk see Povel (2009) and below.

accounts for the explicit risk perception of households, rather than predicting the future from previous shock exposure.

In our empirical analysis below we apply a series of measures in order to test whether female headed households are more vulnerable. This includes the measures proposed by Townsend (1994), Calvo and Decon (2005), as well as Povel (2009).

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 in connection with static poverty analyses 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 education of children seems to be possible providing 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 risks and shocks emanating from markets 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.[10] 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 and exposed to risks 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).[11] 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.

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

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

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

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 in1985 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). Fourth, there is evidence for economic disadvantages of women in terms of access to capital and other productive assets, as well as to apprenticeship and pest management training (e.g. Vijverberg, 1998; Chi et al., 1998).

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 were selected because they rank in the lowest income quintile among each country's provinces. They are geographically in very different areas in each country, which hopefully provides some external validity of the results.

The sample of households was selected via a three-stage cluster-sampling procedure. The six provinces served as strata. In each, sub-districts were selected with a probability proportional to size, measured as 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 size. 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 demographic, weather related, economic and agricultural events are crucial to our analysis. The shock section is designed to record shocks experienced by the households between 2003 and 2008. It aims at shedding light on the severity of adverse events by asking about their impact on income and assets. Thus, this section enables us to quantify the ex-post shock exposure of households. The risk section aims at eliciting information about the frequency, as well as the severity of the impact on income 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

First, we analyze determinants of consumption in Thailand and Vietnam using a cross section. Special attention is paid to female-headed households which are divided into *de jure* and *de facto* female-headed households. Disaggregating the results even further, we then control for widows, divorced and unmarried heads, and female heads with absent husbands. To account for differences in the demographic composition of households (as shown by the dependency ratio between male- and female-

headed households) we measure consumption through adult equivalence scales as proposed by the World Bank and allow for economies of scale using a power of .8.[12]

Second, we analyze exposure to adverse events using a Probit model with a shock dummy serving as outcome variable and various household head characteristics serving as control variables to show the relative likelihood with which female heads are exposed to shocks. The household characteristics education and age serve as proxies for the ability of the household to cope and mitigate in an uncertain environment, while land size is our measure of wealth.

Third, we investigate to what degree 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, for example, Townsend, 1994). We follow the approach from these contributions and regress changes in consumption on a set of covariates and income change. The coefficient of the latter variable represents the degree to which households are able to smooth their consumption. If it is significantly different from zero the null hypothesis of perfect risk sharing must be rejected. In order to examine differences between different types of households we also interact the income change variable with different dummies for female headship.

Fourth, we analyze determinants of vulnerability to poverty as put forward by Calvo and Dercon (2005) . Using information from, among others, our shock module we quantify vulnerability to poverty and use our benchmark regression to identify correlates of this measure.

Finally, we quantify perceived vulnerability to downside risk in our sample as proposed by Povel (2009). The measure of vulnerability to downside risk assigns an index of deprivation d_{hi} – with 0 implying no deprivation and 1 implying the highest possible deprivation – to every state of the world i a household h possibly experiences in the future and weighs it with its probability of occurrence p_{hi}. Thus, a household's vulnerability equals

$$V_h = \sum_{i=1}^{N_h} ({d_{hi}}^{\alpha} \times p_{hi}) \text{ , with}$$

$$0 \leq d_{hi} \leq 1 \quad \text{and} \quad \sum_{i=1}^{N_h} p_{hi} = 1.$$

[12] Note that for Thailand and Vietnam there no country specific equivalence scales exist.

α is a parameter measuring risk attitudes. Assuming risk-aversion we set α equal to two. We calculate a measure of vulnerability that relies on twelve different adverse events. Information on risks is provided by data from the questionnaire's section on subjective risk perception. We regress household vulnerability levels on different groupings of female-headed household dummies and a host of other covariates.

5.3 Results

As table 1 indicates there are 451 (20.8% of all Thai households) headed households in Thailand. Of these 359 households are de jure and 92 are de facto female headed. Disaggregating the subgroups even further we see that de jure female headed households are made up of 298 widow headed and 61 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 14.8% of all Vietnamese households belong to this category. Of the 265 de jure female headed households in Vietnam 202 are headed by a widow and 63 by a single female. In 58 households female head's husbands are absent. With 66.1% and 62.5%, respectively, widow headed households represent by far the largest share of female headed households in both Thailand and Vietnam. Also, the share of de facto female headed households is with 20.4% of all female headed households in Thailand and 18.0% in Vietnam similar in both countries. By contrast, only 13.5% of female headed households in Thailand have a single head whereas 19.5% of female headed households in Vietnam belong to this subgroup.

We analyze differences in consumption between different types of households by regressing logged consumption on dummy variables representing different types of female headed households and a set of covariates including household demographics (household size and dependency ratio), additional household head related information (education and age), land holdings, not mutually exclusive income sector dummies, as well as village dummies (cf. table 2).[13] 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). The respective coefficient is significant at the 1%-level.

[13] Note that we measure consumption per adult equivalent using the scale proposed by the World Bank and include economies of scale (power of 0.8).

Consumption of female headed households is on average 8.4% higher than consumption of other households.[14] 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). Splitting the female headship dummy into de facto and de jure provides a richer picture (columns 3 and 4): The Thai result is driven by de facto female headed households who consume on average 32.2% (!) 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 (19.0%) and de jure female headed households significantly less (-7.8%) than male headed ones. The latter result can be attributed to single female headed households whose consumption is on average 16.9% below the consumption of male headed households (significant at 1%-level; column 6). 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 other covariates enter the regressions largely as expected: Household size is associated with significantly lower consumption across all specifications. A higher dependency ratio implies lower consumption, too. However, the significance of this relationship is not robust to different specifications. 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 which impact across all specifications positively and significantly on consumption. 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.

With the given specifications we can explain a considerable share of variation in logged consumption: The adjusted R squareds of the three Thai specifications range between .23 and .24, the Vietnamese ones even between .43 and .44. Village dummies are included in every specification and contribute substantially to the explanatory power of our specification. The large difference between the adjusted R

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

squareds between both countries suggests that village membership determines consumption much more in Vietnam than in Thailand.

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. Table 3 shows that the incidence of adverse events differs to a great deal between both countries. The 19.8% of Vietnamese households that report to have experienced an adverse event by far exceed the 5.6% of Thai households that were shock affected. Social shocks – related to social obligations, migration, crimes and associated punishments, as well as house damage – play a marginal role in both countries. Less than 2% of households are hit by such events. Health shocks, i.e. mainly illnesses but also births, accidents, and deaths, affect 2.3% of Thai and 8.0% of Vietnamese households. They are the most common adverse events in Thailand. Vietnamese households, however, suffer mainly from income shocks which strike 11.2% of our sampled households from this country. Only 1.9% of Thai households experience such events. Disaggregating income shocks into market and agricultural supply shocks shows that the latter are predominant in Vietnam where every tenth household is hit by events such as livestock diseases, crop pests, bad weather, and droughts. This difference between both countries is in line with the fact that in Vietnam a comparatively small share of households has diversified its income sources away from the primary sector (cf. appendix). Market related events are of minor importance. The most common specific shock in both countries is an illness which strikes 1.4% of Thai and 6.2% of Vietnamese households. This result are similar to the one of Wagstaff and Lindelow (2010) who find that in neighboring Laos illnesses are the most common type of (not-aggregated) socks.

Female and male headed households seem to be similarly exposed to shocks (cf. summary statistics in appendix). The only obvious exception is illness in Vietnam which affects 9.0% of female headed households but merely 5.7% of male headed ones. In order to further scrutinize this insight we run probit regressions with a depend variable that equals one if the observed household experiences any shock and zero otherwise (cf. table 4). Female headed households in Thailand are more prone to adverse events than male headed households (column 1). This correlation is slightly significant (at the 10%-level) and seems to be mainly driven by de jure female headed households (column 3) or, more precisely, by single female headed households (column 5). The results from Vietnam draw a slightly different picture. Here female headed household are on average not significantly more exposed to shocks than others (column

2). However, de jure female headed households are significantly more likely to be hit by an adverse event than male headed households (column 4). This result cannot mainly be attributed to single female headed households as in Thailand but rather to widow headed ones (column 6).

Other covariates from the probit specifications are largely insignificant. An exception is, among others, the significantly (at 10%-level) positive coefficient of logged land holdings in Vietnam where land seems to be rather a proxy for planted crops, as opposed to wealth. Planted crops probably render households more susceptible to events such as crop pests and bad weather. Also, Vietnamese households that engage in non-farm activities are significantly (at 10%-level) more exposed to shocks than the ones that do not. This finding may reflect that the dependent variable captures various business related events such as price shocks and job losses. In Thailand households that practice cropping agriculture are significantly (at 5%-level) less likely to experience an adverse event than households that do not. Again it seems that the design of the dependent variable which primarily represents non-crop, non-agricultural shocks contributes to this correlation. Finally, households holding livestock are more prone to shocks than the ones without livestock in both Thailand and Vietnam.

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 likely to be underpowered in most of these specifications due to an insufficient amount of observations. Nonetheless, it is worthwhile mentioning that the association between income, market, and agricultural supply shocks, on the one hand, and single female headed households in Thailand, on the other, is significantly positive. By contrast, widow headed households in Thailand suffer significantly less from income and market shocks implying that they rather rely on other income sources such as remittances and pensions.

Besides current levels of consumption and associated determinants, as well as shock probabilities and their correlates, consumption smoothing capacities of households have to be quantified in order to assess households' vulnerability holistically. Therefore, we regress consumption change between both survey rounds (measured as share of consumption in wave one) on income change during the same period, female headship dummies and interactions between the two, as well as on village dummies (cf. table 5). As mentioned above, this approach follows Townsend (1994) and 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 significantly 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 7% reduction in consumption which still implies a fairly large degree of risk sharing. However, we are likely to underestimate the impact of income change due to attenuation bias. Female headed households' consumption change was on average 14.9% below the one of male headed households which can primarily be attributed to de facto female headed and widow headed households (column 5). The interaction term of female headed households and income change suggests that this group of households is able to smooth its consumption almost perfectly. Taken the point estimates from income change and the interaction term together female headed households seem to adjust their consumption by less than 1% in case of a 100 change in income. However, this result is almost entirely due to de facto female headed households who are relatively likely to receive countercyclical remittances from their heads' absent husband (column 3). Instead, de jure female headed households seem to insure only around four fifths of their consumption against income changes as is indicated by the point estimates of income change and the respective interaction term in column 3.

There is seemingly perfect risk sharing between households in Vietnamese villages (columns 2, 4, and 6). The coefficients of income change, as well as their standard errors are very close to zero which rules out even small effects. This result has to be interpreted cautiously since income may very well be measured erroneously which would attenuate its coefficients towards zero. Also, less than 1% of the variation in consumption change in the Vietnamese sample can be explained by the covariates which include around 100 village dummies casting additional doubts on the accuracy of measured consumption and income changes. With this shortcoming in mind we see that consumption changes experienced by any type of female headed households are not significantly different from the ones of male headed households (columns 2, 4, and 6). However, female headed households are significantly less able than others to insure consumption against income fluctuations (column 2). The respective interaction term is significant at the 5-%level. Its point estimate, however, suggests a very small difference between the two groups of households of merely .36 percentage points. Especially de jure female headed households are worse in smoothing consumption (columns 4 and 6).

Next we analyze determinants of vulnerability to poverty which we measure similarly to Calvo and Dercon (2007; cf. table 6). We see that in Thailand female headed households are significantly less vulnerable to poverty than male headed households (column 1). Mainly de facto female headed

households are responsible for this difference which is plausible given the fact that their level of current consumption is significantly higher than the one of their male headed counterparts (see above; columns 3 and 5). Surprisingly, also single female headed households in Thailand are significantly less vulnerable to poverty than male headed ones (column 5). The situation in Vietnam is very similar. Although overall the vulnerability to poverty of female and male headed household is not significantly different (column 2), de facto female headed households are significantly less vulnerable (columns 3 and 5). Again, this result is most likely due to the relatively high level of current consumption these households enjoy. These insights also complement the previous findings regarding shock probabilities and consumption smoothing capacities of households. Although de jure female headed households are on average more likely to experience a shock and perform relatively bad in smoothing their consumption they are not significantly more vulnerable to poverty. This implies that their current level of consumption must be on average sufficiently high above the poverty line to protect them from the threat of poverty.

The other covariates in table 6 exhibit plausible correlations with vulnerability to poverty: Household size and dependency ratio increase vulnerability significantly (at the 1%- and 5%-level, respectively) across all specifications. Instead, household head's education and age (the latter only in Vietnam) are associated with significantly lower levels of vulnerability as are logged land holdings. Finally, Vietnamese households that plant crops are significantly (at 10%-level) more vulnerable to poverty than households that do not. As the adjusted R squareds indicate we are able to explain around 6% of the variation in the dependent variable in the Thai sample. Our explanatory power in the Vietnamese sample is with more than 15% more than twice as high.

After having investigated current levels of consumption, shock exposure, consumption smoothing capacities and vulnerability to poverty we finally turn to a subjective measure of vulnerability. Following Povel (2009; see above) we calculate household specific perceived vulnerability to downside risk and regress it on our benchmark regression used throughout the paper (cf. table 7).[15] In Thailand female headed households are on average significantly (at 5%-level) more vulnerable to downside risk than male headed households (column 1). However, when female headship is disaggregated it is revealed that de facto female headed households are less, though statistically not significantly, and de jure female

[15] 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.

headed households significantly (at 5%-level) more vulnerable than male headed households (column 3). From the de jure subgroups only widow headed households have a significant coefficient (column 5). This difference between the perception of de jure and de facto female headed households reflects the findings from above – namely that de jure headed households are worse off in terms of shock exposure and smoothing capacities. Correlations between female headship dummies and vulnerability to downside risk are statistically not distinguishable from zero in the Vietnamese subsample.

Other significant correlates of vulnerability to downside risk are engagement in the crop sector (at 1%-level) and logged land holdings (at 5%-level) in Thailand which can probably be attributed to the large share of agricultural risks that are incorporated in the dependent variable. Interestingly, the relationship between education of household head and vulnerability is non-linear in both countries. Not only heads with no education (significantly only in Thailand) but also heads with higher levels of education (only partly significantly) are less vulnerable than heads with primary education.

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, among others, high dependency burdens, economic immobility and the "double day burden" of their heads.

Despite such assertions, studies investigating female-headed households are not always poorer. We argue therefore, that they might be more vulnerable to poverty as they face higher risks and/or have fewer options for ex ante and ex post coping strategies. In order to substantiate our discussion empirically we scrutinize whether female headed households consume less, are more exposed to shocks, perform worse in consumption smoothing, and are more vulnerable to poverty or perceived downside risk than male headed ones.

Our findings show that female headed households in general do not seem to be systematically disadvantaged – neither in Thailand nor in Vietnam. However, female headed households are not a homogeneous group and de jure female headed households, made up of single and widow heads, are more vulnerable than other households.

More precisely, in terms of levels of current consumptions we find that in both Thailand and Vietnam de facto female headed households are better off than other types of households suggesting that they benefit substantially from remittances received from the head's absent husband. Instead, single female headed households in Vietnam consume significantly less than other households in our Vietnamese sample. With respect to shock exposure we show that de jure female headed households in both countries are more likely to experience an adverse event. This result is mainly driven by singles in Thailand and widows in Vietnam. Also in the case of consumption smoothing capacities we find that de jure headed households have more difficulties to insure their consumption against income shocks than other households. Turning to vulnerability to poverty our results suggest that, if anything, female headed households are less vulnerable to poverty. This can be attributed to de facto female headed households which seem to be far above the poverty line and consequently not in danger to fall below it in the upcoming period. Finally, we find that de jure female headed households are more vulnerable to perceived downside risk than other households in Thailand and Vietnam. Given our other results concerning shock exposure and consumption smoothing capacities this insight contributes plausible additional information to the analysis.

We conclude that disaggregating female headed households into subgroups is not only relevant in poverty but also in vulnerability research. De facto female headed households seem to be by no means worse off than other households – they even consume on average more than male headed households. This suggests that there is no need to target this particular group with poverty and/or vulnerability reducing policies. By contrast, households headed by single females and widows seem to be more vulnerable than other households why they deserve special consideration in the design and targeting of vulnerability reducing policies.

Table 1: Headship and sample size

Country	Female			Male
Thailand	451			1721
Vietnam	323			1866
	De Jure		**De Facto**	
Thailand	359		92	
Vietnam	265		58	
	Widow	**Single**	**Absent Husband**	
Thailand	298	61	92	
Vietnam	202	63	58	

Table 2: Determinants of consumption

Outcome	ln(Consumption)					
	(1)	(2)	(3)	(4)	(5)	(6)
OLS	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	0.0809***	-0.0300				
	(0.0301)	(0.0299)				
De Facto FHH			0.279***	0.174***		
			(0.0512)	(0.0618)		
De Jure FHH			0.0236	-0.0816**		
			(0.0346)	(0.0323)		
FHH, absent husband					0.283***	0.169***
					(0.0512)	(0.0617)
FHH, widow					0.00307	-0.0494
					(0.0365)	(0.0355)
FHH, single					0.113	-0.185***
					(0.0775)	(0.0607)
HH Size (Adult Equivalents)	-0.110***	-0.128***	-0.108***	-0.128***	-0.107***	-0.130***
	(0.0160)	(0.0145)	(0.0160)	(0.0146)	(0.0161)	(0.0146)
Dep. Ratio	-0.0260	-0.0186	-0.0334**	-0.0248*	-0.0336**	-0.0248*
	(0.0160)	(0.0138)	(0.0162)	(0.0140)	(0.0162)	(0.0140)
Head: No Education	-0.0644*	-0.0705**	-0.0550	-0.0583*	-0.0537	-0.0589*
	(0.0375)	(0.0313)	(0.0374)	(0.0317)	(0.0373)	(0.0316)
Head: Middle School Education	0.103*	0.111***	0.103*	0.110***	0.104*	0.109***
	(0.0569)	(0.0264)	(0.0560)	(0.0263)	(0.0561)	(0.0263)
Head: Secondary Education	0.350***	0.222***	0.357***	0.219***	0.354***	0.217***
	(0.0575)	(0.0335)	(0.0571)	(0.0334)	(0.0575)	(0.0335)
Head: Tertiary Education	0.573***	0.417***	0.572***	0.411***	0.566***	0.406***
	(0.0654)	(0.0480)	(0.0654)	(0.0477)	(0.0658)	(0.0477)
Age of Head	0.00874	0.0239***	0.0114*	0.0254***	0.0113*	0.0258***
	(0.00600)	(0.00540)	(0.00606)	(0.00539)	(0.00606)	(0.00541)
Age Sq.	-0.000123**	-0.000235***	-0.000136**	-0.000245***	-0.000134**	-0.000251***
	(5.33e-05)	(5.16e-05)	(5.35e-05)	(5.16e-05)	(5.36e-05)	(5.19e-05)
Ln(Land)	0.103***	0.0956***	0.105***	0.0930***	0.106***	0.0925***
	(0.0111)	(0.00999)	(0.0111)	(0.0101)	(0.0111)	(0.0101)
Non-Farm Sector	0.0489*	0.0531**	0.0614**	0.0619***	0.0617**	0.0603***
	(0.0255)	(0.0220)	(0.0258)	(0.0220)	(0.0258)	(0.0221)
Crops Sector	-0.157***	-0.195***	-0.161***	-0.190***	-0.160***	-0.191***
	(0.0440)	(0.0418)	(0.0439)	(0.0419)	(0.0439)	(0.0419)

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Table 2: continued

Livestock Sector	-0.0301	-0.0355	-0.0313	-0.0371	-0.0302	-0.0402
	(0.0290)	(0.0284)	(0.0288)	(0.0283)	(0.0289)	(0.0283)
Constant	7.805***	7.207***	7.705***	7.159***	7.698***	7.164***
	(0.175)	(0.140)	(0.178)	(0.140)	(0.178)	(0.140)
Observations	2,169	2,180	2,169	2,180	2,169	2,180
Adjusted R-squared	0.233	0.433	0.239	0.438	0.239	0.439

Robust standard errors in parentheses

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

Outcome: per Adult Equivalent (World Bank Scale) and Economies of Scale (0.8)

Reference group for Educational Attainment: Primary Education

Income sector dummies are not exclusive (no reference group)

Village dummies not reported

Table 3: Prevalence of shock exposure by country (in percent)

	Any Shock	No Shock
Thailand	5.57	94.43
Vietnam	19.78	80.22

	Income Shock	Health Shock	Social Shock
Thailand	1.93	2.26	1.43
Vietnam	11.19	7.95	1.28

	Market Shock				Agricultural Supply Shock			
Thailand	1.52				0.41			
Vietnam	1.05				10.42			

	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	0.78	0.18	0.46	0.09	0.05	0.09	0.23	0.05	0.05	1.43	0.14	0.64	0.41	0.09	0.37	0.55
Vietnam	0.09	0.78	0.18	0.00	2.06	4.48	2.88	1.51	0.82	6.21	0.55	0.55	0.18	0.27	0.64	0.18

Table 4: Determinants of shock exposure

Outcome	Any Shock					
	(1)	(2)	(3)	(4)	(5)	(6)
Probit	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	0.195*	0.114				
	(0.115)	(0.0911)				
De Facto FHH			0.0419	-0.124		
			(0.239)	(0.210)		
De Jure FHH			0.231*	0.171*		
			(0.133)	(0.101)		
FHH, absent husband					0.0582	-0.127
					(0.240)	(0.210)
FHH, widow					0.143	0.201*
					(0.143)	(0.112)
FHH, single					0.530**	0.0742
					(0.236)	(0.194)
HH Size (Adult Equivalents)	0.0318	0.0183	0.0287	0.0188	0.0346	0.0180
	(0.0589)	(0.0465)	(0.0586)	(0.0465)	(0.0586)	(0.0464)
Dep. Ratio	0.00229	-0.0348	0.00924	-0.0289	0.00666	-0.0291
	(0.0562)	(0.0486)	(0.0569)	(0.0490)	(0.0554)	(0.0490)
Head: No Education	0.158	0.0589	0.151	0.0439	0.149	0.0434
	(0.148)	(0.103)	(0.148)	(0.104)	(0.147)	(0.104)
Head: Middle School Education	-0.105	-0.0538	-0.106	-0.0523	-0.0974	-0.0521
	(0.254)	(0.0904)	(0.256)	(0.0908)	(0.255)	(0.0908)
Head: Secondary Education	-0.137	-0.172	-0.147	-0.170	-0.166	-0.171
	(0.256)	(0.112)	(0.255)	(0.112)	(0.253)	(0.112)
Head: Tertiary Education	0.0149	-0.323	0.0149	-0.314	-0.0100	-0.315
	(0.295)	(0.199)	(0.294)	(0.200)	(0.293)	(0.200)
Age of Head	0.0191	-0.0111	0.0175	-0.0126	0.0167	-0.0123
	(0.0271)	(0.0165)	(0.0273)	(0.0165)	(0.0272)	(0.0165)
Age Sq.	-0.000186	7.89e-05	-0.000179	8.81e-05	-0.000162	8.32e-05
	(0.000245)	(0.000154)	(0.000246)	(0.000154)	(0.000244)	(0.000155)
Ln(Land)	0.0389	0.0550*	0.0368	0.0558*	0.0386	0.0555*
	(0.0444)	(0.0332)	(0.0444)	(0.0334)	(0.0443)	(0.0334)
Non-Farm Sector	0.121	0.141*	0.111	0.132*	0.113	0.131*
	(0.103)	(0.0780)	(0.103)	(0.0777)	(0.103)	(0.0778)
Crops Sector	-0.290**	0.110	-0.285**	0.107	-0.285**	0.103
	(0.139)	(0.120)	(0.139)	(0.120)	(0.138)	(0.119)

Continued on next page

Table 4: continued

Livestock Sector	0.266**	0.235**	0.267**	0.236**	0.265**	0.234**
	(0.124)	(0.0948)	(0.124)	(0.0947)	(0.125)	(0.0948)
Constant	-2.215***	-0.981**	-2.151***	-0.939**	-2.183***	-0.931**
	(0.789)	(0.439)	(0.800)	(0.438)	(0.800)	(0.437)
Observations	2,053	2,189	2,053	2,189	2,053	2,189
Wald Chi2	140.3	198.7	140.6	201.1	152.8	210.4
Prob > Chi2	8.11e-10	0	1.20e-09	0	0	0
Pseudo R2	0.0592	0.0544	0.0597	0.0551	0.0621	0.0553

Robust standard errors in parentheses (village cluster effects)

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

Reference group for Educational Attainment: Primary Education

Income sector dummies are not exclusive (no reference group)

District Dummies not reported

Table 5: Degree of consumption smoothing

Outcome	Consumption change					
	(1)	(2)	(3)	(4)	(5)	(6)
OLS	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Income Change	0.0701**	0.00161	0.0700**	0.00160	0.0700**	0.00162
	(0.0284)	(0.00132)	(0.0284)	(0.00132)	(0.0284)	(0.00133)
Female Head	-0.149***	-0.0186				
	(0.0547)	(0.0587)				
De Facto FHH			-0.254**	-0.145		
			(0.101)	(0.0960)		
De Jure FHH			-0.123**	0.0119		
			(0.0590)	(0.0661)		
FHH, absent husband					-0.254**	-0.143
					(0.101)	(0.0961)
FHH, widow					-0.133**	0.0564
					(0.0641)	(0.0755)
FHH, single					-0.0829	-0.142
					(0.131)	(0.0989)
Female Head * Income Change	-0.0663**	0.00360**				
	(0.0283)	(0.00141)				
De Facto FHH * Income Change			-0.0660**	-0.0972*		
			(0.0284)	(0.0556)		
De Jure FHH * Income Change			0.148**	0.00348**		
			(0.0752)	(0.00142)		
FHH, absent husband * Income Change					-0.0660**	-0.0971*
					(0.0284)	(0.0559)
FHH, widow * Income Change					0.135	0.00288**
					(0.0854)	(0.00143)
FHH, single * Income Change					0.206	0.196**
					(0.163)	(0.0839)
Constant	0.323***	0.339***	0.323***	0.339***	0.322***	0.339***
	(0.0272)	(0.0248)	(0.0272)	(0.0249)	(0.0273)	(0.0249)
Observations	784	982	784	982	784	982
Adj. R2	0.040	0.004	0.050	0.004	0.048	0.007

Robust standard errors in parentheses

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

Village Dummies not reported

Table 6: Determinants of vulnerability to poverty

Outcome	Vulnerability to poverty					
	(1)	(2)	(3)	(4)	(5)	(6)
OLS	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	-0.0118**	-0.000161				
	(0.00577)	(0.0112)				
De Facto FHH			-0.0202**	-0.0512***		
			(0.00811)	(0.0197)		
De Jure FHH			-0.00943	0.00994		
			(0.00664)	(0.0122)		
FHH, absent husband					-0.0211***	-0.0504**
					(0.00812)	(0.0197)
FHH, widow					-0.00577	0.00369
					(0.00737)	(0.0132)
FHH, single					-0.0250**	0.0288
					(0.0109)	(0.0245)
HH Size (Adult Equivalents)	0.0142***	0.0299***	0.0142***	0.0296***	0.0139***	0.0298***
	(0.00333)	(0.00552)	(0.00333)	(0.00555)	(0.00333)	(0.00555)
Dep. Ratio	0.00970**	0.0146***	0.00997**	0.0163***	0.0100**	0.0163***
	(0.00403)	(0.00519)	(0.00410)	(0.00525)	(0.00409)	(0.00524)
Head: No Education	0.00992	0.00180	0.00956	-0.000916	0.00956	-0.000298
	(0.00922)	(0.0123)	(0.00925)	(0.0123)	(0.00922)	(0.0124)
Head: Middle School Education	-0.0131	-0.0286***	-0.0137	-0.0288***	-0.0139	-0.0289***
	(0.00841)	(0.0103)	(0.00843)	(0.0102)	(0.00848)	(0.0102)
Head: Secondary Education	-0.0212***	-0.0398***	-0.0215***	-0.0403***	-0.0206***	-0.0402***
	(0.00732)	(0.0125)	(0.00734)	(0.0125)	(0.00742)	(0.0125)
Head: Tertiary Education	-0.0143**	-0.0632***	-0.0145**	-0.0614***	-0.0138**	-0.0612***
	(0.00657)	(0.0135)	(0.00657)	(0.0136)	(0.00647)	(0.0136)
Age of Head	0.000970	-0.00500**	0.000886	-0.00523**	0.000936	-0.00525**
	(0.00113)	(0.00207)	(0.00112)	(0.00207)	(0.00112)	(0.00208)
Age Sq.	-4.91e-06	4.95e-05**	-4.53e-06	5.05e-05**	-5.37e-06	5.10e-05**
	(1.03e-05)	(1.99e-05)	(1.02e-05)	(1.99e-05)	(1.03e-05)	(2.00e-05)
Ln(Land)	-0.0113***	-0.0185***	-0.0115***	-0.0178***	-0.0115***	-0.0177***
	(0.00224)	(0.00370)	(0.00226)	(0.00376)	(0.00226)	(0.00376)
Number of Income Sources	0.00103	-0.00365	0.000912	-0.00415	0.000840	-0.00422
	(0.00317)	(0.00493)	(0.00317)	(0.00494)	(0.00318)	(0.00492)
Non-Farm Sector	-0.00472	-0.00736	-0.00496	-0.00895	-0.00487	-0.00887
	(0.00687)	(0.00967)	(0.00688)	(0.00976)	(0.00690)	(0.00975)

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Table 6: continued

Crops Sector	-0.00410	0.0339**	-0.00352	0.0336**	-0.00356	0.0341**
	(0.00783)	(0.0151)	(0.00781)	(0.0151)	(0.00782)	(0.0150)
Livestock Sector	-0.00718	0.00874	-0.00713	0.0100	-0.00704	0.0107
	(0.00796)	(0.0122)	(0.00796)	(0.0122)	(0.00796)	(0.0121)
Constant	-0.0442	0.0760	-0.0410	0.0849	-0.0404	0.0831
	(0.0324)	(0.0544)	(0.0320)	(0.0543)	(0.0320)	(0.0542)
Observations	1,337	1,466	1,337	1,466	1,337	1,466
Adj. R2	0.104	0.214	0.104	0.217	0.104	0.218

Robust standard errors in parentheses

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

Reference group for Educational Attainment: Primary Education

Income sector dummies are not exclusive (no reference group)

Village Dummies not reported

Table 7: Determinants of vulnerability to poverty

Outcome	Vulnerability to downside risk					
	(1)	(2)	(3)	(4)	(5)	(6)
OLS	Female Head		De Facto vs. De Jure		FHH Subgroups	
	Thailand	Vietnam	Thailand	Vietnam	Thailand	Vietnam
Female Head	0.00630**	-0.000879				
	(0.00305)	(0.00191)				
De Facto FHH			-0.000742	-0.00472		
			(0.00473)	(0.00352)		
De Jure FHH			0.00834**	8.56e-05		
			(0.00375)	(0.00216)		
FHH, absent husband					-0.000281	-0.00473
					(0.00466)	(0.00352)
FHH, widow					0.00620*	0.000220
					(0.00324)	(0.00250)
FHH, single					0.0177	-0.000341
					(0.0136)	(0.00320)
HH Size (Adult Equivalents)	0.00181	0.000458	0.00174	0.000462	0.00186	0.000457
	(0.00200)	(0.000930)	(0.00201)	(0.000930)	(0.00194)	(0.000930)
Dep. Ratio	0.00266	-0.000113	0.00292	3.47e-06	0.00290	2.94e-06
	(0.00200)	(0.000828)	(0.00204)	(0.000830)	(0.00203)	(0.000830)
Head: No Education	-0.00830***	-0.00263	-0.00863***	-0.00286	-0.00849***	-0.00286
	(0.00295)	(0.00208)	(0.00299)	(0.00210)	(0.00293)	(0.00210)
Head: Middle School Education	-0.00500	-0.000668	-0.00500	-0.000641	-0.00488	-0.000643
	(0.00438)	(0.00179)	(0.00436)	(0.00180)	(0.00436)	(0.00180)
Head: Secondary Education	-0.00755	-0.00208	-0.00779*	-0.00203	-0.00804*	-0.00203
	(0.00472)	(0.00191)	(0.00472)	(0.00191)	(0.00474)	(0.00191)
Head: Tertiary Education	-0.00795	-0.00653**	-0.00796	-0.00642**	-0.00854*	-0.00644**
	(0.00484)	(0.00301)	(0.00487)	(0.00301)	(0.00487)	(0.00302)
Age of Head	-0.000253	0.000229	-0.000348	0.000200	-0.000357	0.000201
	(0.000595)	(0.000346)	(0.000594)	(0.000346)	(0.000595)	(0.000347)
Age Sq.	1.52e-06	-3.21e-06	2.00e-06	-3.03e-06	2.27e-06	-3.05e-06
	(5.35e-06)	(3.16e-06)	(5.33e-06)	(3.16e-06)	(5.32e-06)	(3.17e-06)
Ln(Land)	0.00171**	0.000469	0.00165**	0.000519	0.00170**	0.000516
	(0.000826)	(0.000558)	(0.000819)	(0.000561)	(0.000840)	(0.000560)
Number of Income Sources	-0.000804	-0.000209	-0.000895	-0.000235	-0.000908	-0.000236
	(0.00161)	(0.00101)	(0.00159)	(0.00101)	(0.00157)	(0.00101)
Non-Farm Sector	-0.00113	0.000226	-0.00145	9.18e-05	-0.00141	8.64e-05
	(0.00389)	(0.00175)	(0.00396)	(0.00175)	(0.00390)	(0.00175)

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Table 7: continued

Crops Sector	0.0103***	0.00497	0.0106***	0.00491	0.0106***	0.00491
	(0.00358)	(0.00327)	(0.00359)	(0.00328)	(0.00360)	(0.00328)
Livestock Sector	0.00315	-0.00143	0.00334	-0.00136	0.00347	-0.00137
	(0.00339)	(0.00218)	(0.00337)	(0.00218)	(0.00334)	(0.00219)
Constant	0.0192	0.00696	0.0228	0.00789	0.0221	0.00791
	(0.0163)	(0.00940)	(0.0165)	(0.00946)	(0.0166)	(0.00946)
Observations	2,172	2,189	2,172	2,189	2,172	2,189
Adj. R2	0.019	0.063	0.020	0.064	0.020	0.063

Robust standard errors in parentheses

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

Reference group for Educational Attainment: Primary Education

Income sector dummies are not exclusive (no reference group)

Village Dummies not reported

Appendix

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
lnC	USD PPP	7.085	6.739	7.109	6.744	7.058	6.699	7.309	6.948	7.016	6.712	7.260	6.658
lnC_AES_ES_nutr	USD PPP	7.550	7.239	7.597	7.204	7.542	7.147	7.812	7.460	7.512	7.157	7.687	7.115
hhsize	members	4.068	4.552	3.554	3.139	3.643	3.091	3.207	3.362	3.805	3.129	2.852	2.968
hhsize_AES_ES_nutr	members	2.470	2.692	2.095	1.905	2.144	1.890	1.906	1.975	2.219	1.916	1.776	1.807
depratio	ratio	1.558	1.677	1.724	1.638	1.614	1.465	2.153	2.428	1.638	1.435	1.497	1.559
children1	members	0.089	0.092	0.093	0.056	0.089	0.049	0.109	0.086	0.101	0.050	0.033	0.048
children2	members	0.161	0.169	0.164	0.108	0.142	0.083	0.250	0.224	0.158	0.089	0.066	0.063
children3	members	0.223	0.257	0.226	0.152	0.195	0.121	0.348	0.293	0.221	0.129	0.066	0.095
children4	members	0.283	0.342	0.282	0.211	0.248	0.177	0.413	0.362	0.279	0.178	0.098	0.175
children5	members	0.353	0.430	0.335	0.260	0.295	0.223	0.489	0.431	0.326	0.233	0.148	0.190
edu_0	dummy	0.081	0.120	0.220	0.341	0.251	0.404	0.098	0.052	0.265	0.416	0.180	0.365
edu_1	dummy	0.800	0.238	0.721	0.248	0.708	0.253	0.772	0.224	0.708	0.262	0.705	0.222
edu_2	dummy	0.051	0.436	0.031	0.322	0.017	0.268	0.087	0.569	0.017	0.248	0.016	0.333
edu_3	dummy	0.042	0.155	0.013	0.071	0.014	0.060	0.011	0.121	0.007	0.054	0.049	0.079
edu_4	dummy	0.027	0.050	0.016	0.019	0.011	0.015	0.033	0.034	0.003	0.020	0.049	0.000
edu_read	dummy	0.929	0.896	0.794	0.700	0.760	0.645	0.924	0.948	0.745	0.629	0.836	0.698
edu_school	dummy	0.955	0.903	0.871	0.687	0.850	0.626	0.957	0.966	0.829	0.614	0.951	0.667
age	years	53.2	46.6	59.2	53.8	63.9	57.3	41.1	37.7	66.1	60.3	53.0	47.6
age_sq	years sq	2999.0	2352.6	3717.8	3126.7	4218.3	3478.6	1764.5	1518.7	4479.0	3805.8	2944.8	2429.7
lnland	ln(hectar)	0.570	-0.805	0.035	-1.543	0.102	-1.582	-0.228	-1.366	0.206	-1.486	-0.406	-1.887
inc_sources	dummy	3.708	3.202	3.169	2.759	3.240	2.804	2.891	2.552	3.292	2.896	2.984	2.508
remit_d_in	dummy	0.094	0.044	0.084	0.056	0.100	0.064	0.022	0.017	0.107	0.074	0.066	0.032
remit_d_out	dummy	0.028	0.070	0.020	0.043	0.019	0.049	0.022	0.017	0.023	0.050	0.000	0.048
remit_d_net	dummy	0.092	0.040	0.084	0.050	0.100	0.057	0.022	0.017	0.107	0.064	0.066	0.032
remit_net_pc	USD PPP	28.16	-13.16	18.97	25.77	22.43	23.20	5.49	37.48	19.89	31.75	34.81	-4.21
sect_agriculture	dummy	0.955	0.947	0.918	0.870	0.916	0.868	0.924	0.879	0.926	0.876	0.869	0.841
sect_crops	dummy	0.855	0.898	0.723	0.799	0.713	0.800	0.761	0.793	0.732	0.827	0.623	0.714
sect_livestock	dummy	0.781	0.776	0.634	0.697	0.646	0.679	0.587	0.776	0.671	0.733	0.525	0.508
sect_lstprod	dummy	0.404	0.420	0.308	0.368	0.309	0.381	0.304	0.310	0.315	0.401	0.279	0.317
sect_fishing	dummy	0.712	0.335	0.685	0.223	0.691	0.230	0.663	0.190	0.698	0.218	0.656	0.270
sect_nonfarm	dummy	0.727	0.633	0.625	0.548	0.660	0.581	0.489	0.397	0.658	0.564	0.672	0.635
sect_offfarmempl	dummy	0.562	0.488	0.494	0.421	0.538	0.449	0.326	0.293	0.530	0.446	0.574	0.460
sect_selfempl	dummy	0.300	0.240	0.239	0.195	0.242	0.200	0.228	0.172	0.238	0.198	0.262	0.206
income_shockgroup	dummy	0.020	0.114	0.018	0.102	0.019	0.106	0.011	0.086	0.003	0.119	0.098	0.063
market_shockgroup	dummy	0.015	0.011	0.016	0.006	0.017	0.008	0.011	0.000	0.003	0.005	0.082	0.016
supply_shockgroup	dummy	0.005	0.105	0.002	0.099	0.003	0.102	0.000	0.086	0.000	0.114	0.016	0.063
health_shockgroup	dummy	0.020	0.075	0.031	0.105	0.036	0.113	0.011	0.069	0.037	0.114	0.033	0.111
social_shockgroup	dummy	0.012	0.014	0.022	0.003	0.022	0.004	0.022	0.000	0.023	0.000	0.016	0.016
Households	N	1721	1866	451	323	359	265	92	58	298	202	61	63

Appendix continued

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
livestock_shock	dummy	0.001	0.020	0.000	0.022	0.000	0.023	0.000	0.017	0.000	0.030	0.000	0.000
crop_shock	dummy	0.001	0.045	0.000	0.043	0.000	0.045	0.000	0.034	0.000	0.050	0.000	0.032
storm_shock	dummy	0.002	0.029	0.002	0.025	0.003	0.026	0.000	0.017	0.000	0.030	0.016	0.016
drought_shock	dummy	0.001	0.014	0.000	0.019	0.000	0.015	0.000	0.034	0.000	0.015	0.000	0.016
credit_shock	dummy	0.008	0.001	0.009	0.000	0.008	0.000	0.011	0.000	0.003	0.000	0.033	0.000
price_shock	dummy	0.002	0.008	0.000	0.006	0.000	0.008	0.000	0.000	0.000	0.005	0.000	0.016
job_shock	dummy	0.005	0.002	0.002	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.016	0.000
birth_shock	dummy	0.000	0.008	0.002	0.009	0.003	0.011	0.000	0.000	0.003	0.010	0.000	0.016
illness_shock	dummy	0.013	0.057	0.018	0.090	0.019	0.094	0.011	0.069	0.020	0.094	0.016	0.095
accident_shock	dummy	0.001	0.006	0.002	0.000	0.003	0.000	0.000	0.000	0.003	0.000	0.000	0.000
death_shock	dummy	0.006	0.004	0.009	0.012	0.011	0.015	0.000	0.000	0.010	0.020	0.016	0.000
social_shock	dummy	0.003	0.002	0.009	0.003	0.011	0.004	0.000	0.000	0.010	0.000	0.016	0.016
migrated_shock	dummy	0.001	0.003	0.002	0.000	0.000	0.000	0.011	0.000	0.000	0.000	0.000	0.000
crime_shock	dummy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
house_shock	dummy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
remittance_shock	dummy	0.000	0.000	0.004	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.033	0.000
Households	N	1721	1866	451	323	359	265	92	58	298	202	61	63

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