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Household Risk Management in Rural and Urban Thailand

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Household Risk Management in Rural and Urban Thailand

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Abstract

This paper examines the nature of risk faced by households in Thailand and the strategies that these households adopt to mitigate the adverse effect from income shortfalls. I use a new cross-section dataset that is based on a sample of both urban and rural households. I find that price shock is the most prevalent source of income shortfalls. I also find that the most common risk-mitigating strategy employed by households is to borrow from the Village Fund. Nonetheless, there is a high degree of heterogeneity among households, especially in terms of their sources of income and this plays a key role in determining how a household responds to shocks. Thus, it may not be advisable to design policy based on the paradigm of a representative consumer.

[1] I thank Lukas Menkhoff and Robert Pavasuthipaisit for valuable comments. All views and errors are mine.

1. Introduction

It is generally thought that households in developing countries are not only poor but also subject to substantial income fluctuations. Even in Thailand, with a rather modest per-capita monthly income of 4,337 baht or about US$ 108 (the exchange rate in 2005 is about 40 baht/US$), rural households in one area can have low and volatile incomes that are substantial relative to the average or the nation as a whole.

Several interesting issues related to risk, especially the contribution of risk to household vulnerability in developing countries raise two related issues. First, what are the nature and types of risks facing households in developing countries, in particular? How covariate or insurable are these risks? Economic theory predicts that if shocks are idiosyncratic, particular to a household, then risk pooling or insurance arrangements (whether formal or informal) are more likely to offer protection against idiosyncratic shocks. On the other hand, if shocks are aggregate, common to all households, then insurance can be limited.

Second, what strategies or tools are available to manage these risks? Previous studies on risk and insurance find that households facing a risky situation employ a number of risk management strategies. For example, Townsend (1995) finds a substantial consumption smoothing accomplished by rural households in Thailand. Rosenzweig and Wolpin (1993) find that rural households in India engage in substantial buying and selling of livestocks for self-insurance. Other mechanisms might include grain inventories (Paxson and Chaudhuri [1994]), holdings of cash (Lim and Townsend [1994]) and taking recourse to credit.

This paper focuses on these two questions. In particular, it provides a comprehensive analysis of (1) the nature and types of risks facing households in rural and urban areas in Thailand; and (2) the risk coping strategies these households employ. The contribution of this paper is two-fold. First, for researchers, the findings discovered in this paper provide a solid understanding of the actual risk environment. Inspite of its importance, the risk environment especially in the urban setting is an under-researched topic relative to traditional concerns such as risk sharing, insurance arrangements and consumption smoothing. Most research assumes that risk is part of life, and then jump to the model without examining the nature of risk. This paper provides an empirical evidence on the existence and nature of risk. Indeed, to the best of my knowledge, this is the first study of its kind in rural and urban Thailand. Furthermore, the information on the nature of risk can be used as a basis for constructing economic models and hypotheses. Second, for policymakers, answers to these questions will have profound policy implications if the government aims to reduce household vulnerability to shocks. Knowing about the source of risk and the mechanism that households use to cope with risk is important for understanding the determinants of the well-being of households. For example, if it is found that households can not adequately protect themselves from income shock because they lack access to credit and insurance markets. Then, there may be strong justification for policy intervention that allows more access to the credit market.

The analysis of this paper will be based on a representative survey of 1440 households from 96 villages across six provinces in Thailand conducted in 2005. There are two reasons that make Thailand an interesting case for study. First, Thailand is an emerging-market country with a rapidly expanding financial system. Second, Thailand is a dual economy where both formal and informal sectors coexist. These two factors contribute to burgeoning formal and informal credit markets in the country. The survey was carried out between July and September 2005. The survey was designed to be representative of rural and urban households in Thailand; among them are farm households, wage earners and entrepreneurs.

The remainder of this paper is organized as follows. Section 2 describes the data used in the analysis. Section 3 analyzes of the nature and type of risks faced by households in rural and urban areas in Thailand. Section 4 provides descriptive analysis of risk coping strategies adopted by these households. Section 5 concludes this paper and briefly discusses policy implication.

2. Data

The data used in this paper comes from the Ministry of Finance Household Debt Survey (MOF Survey)[2] funded by Thailand's Ministry of Finance. The primary objective of this survey is to shed light on the causes of rising Thai household debt and to assess the risks of rising household debt on financial institutions and the economy.

The data is based on an extensive survey of randomly selected households across six provinces in Thailand. The survey was designed to be representative of rural and urban households in Thailand. The field survey was carried out from July to September 2005. For economic, social and ecological reasons, Thailand is usually classified into four geographical regions: the central region, the northeast, the north and the southern. Aware of regional disparities, the MOF selected six representative provinces from all the four regions to be included in the field survey.

Within each province, four districts were chosen so that the sample contains both rural and urban districts[3]. Within each district four villages were chosen at random, and within each village 15 households were chosen at random. The survey, thus, constitutes a relatively large cross-sectional data with a total of 1440 households from 96 villages across six provinces.

The information collected from households include household responses to shocks; measurements of household's assets, expenditures, income, borrowing, lending and savings; and household demographic variables such as household composition, occupation, education and residential pattern.

This survey provides a unique data set. This database is novel in two aspects. First, this database provides a more representative sample of the true population. While most studies usually focus on rural and agricultural households, this data set contains both rural and urban households; among them are agricultural households, wage earners and entrepreneurs. Although the majority of Thai population reside in rural areas, the share of the population who reside in urban areas has been increasing from 27% in 1988 to 31% in 1998. The majority of these urban households are wage earners and entrepreneurs. Studies on labor market condition in Thailand show that employment in the agricultural sector continues to decline due to crossover into the non-agricultural sector. Recently, SMEs[4] play an

[2] In the past few years, Thailand's average household debt has grown rapidly. The debt-to-income ratio has doubled since the pre-crisis years. The rising household debt has been a widespread phenomena. The initial purpose of the Ministry of Finance Household Debt Survey was to shed light on the causes and distribution of household debt as well as to assess the risks of rising Thai household debt.

[3] Districts are classified into rural and urban areas according to population density.

[4] On September 11th 2002, the Ministry of Industry introduced the definition of Thai small and medium-sized enterprise (SME). An enterprise is categorised as an SME since it has employees less than 200 and fixed capital

increasingly important role in the Thai economy. SMEs (both formal and informal) account for 40-50% of the Thai economy's GDP, 38% of the total value of exports and nearly 60% of employment. Therefore, including households which reside in both rural and urban areas of Thailand allows the sample to reflect the true population more accurately

Second, agricultural households, wage earners and entrepreneurs may be subject to different types of risks and may employ different risk management strategies. By including other occupational types of households in the sample, this database allows us to analyze the risk environment and risk response of other types of households.

The disadvantage of this data set is that it is a single cross-section. A cross sectional data may not be as informative as a panel data due to the absence of data for more than one point in time – that is, this data set does not have any inter-temporal variability. However, single cross-sections can still be used for risk analysis if they are supplemented with retrospective or historical data as is the case for the MOF survey. In the MOF survey, retrospective questions were included to capture, albeit imperfectly, information about past shocks and the corresponding coping strategies.

3. Risk Environment in Rural and Urban Thailand

Before going into detailed analysis, it is important to draw a conceptual distinction between risk and variability. Too often variability is used interchangeably with risk. However, they are not the same because variability alone does not always entail risk although the reverse is true. To make the distinction more clearly, consider for instance agricultural prices. By nature, agricultural prices are highly seasonal and volatile. However if at the time of the planting, farmers know for certain the output price at the time of the selling, then farmers would face no price risk. For variability to translate into risk, it must be that at the time of the planting, farmers do not forecast the prices that will prevail at the time of the selling correctly.

The first step toward understanding household vulnerability entails characterization of the risk environment that households encounter. One needs to know which types of shocks commonly occur and whether these are idiosyncratic or aggregate shocks. The discussion here will characterize the nature of risk and draw key features of the risk environment facing households in rural and urban Thailand.

3.1 Source of Risk

What might be the source of risk faced by households in Thailand? To identify the source of risk, I examine the source of an income fluctuation. In particular, I investigate the fluctuation in households incomes using both aggregate and disaggregate data. According to the National Statistical Office, the average monthly income of a household has been steadily increasing after the financial crisis. In particular, the average monthly income per household increases from 12,150 baht in 2000 to 14,963 baht in 2004 as shown in figure 1. Based on the macroeconomic aggregates, the rising average income indicates that the welfare of households is improving. However, evidence on actual households from the MOF survey gives a different picture. In the MOF survey, households were asked for their own assessment of whether they experienced a severe shortfall in income in the last five years and to name the worst income year and the best income year. The data reveals that not all households have higher income over the last five years. Instead, a number of households experience a shortfall

less than baht 200 million. In practice, the size of SMEs varies. Enterprises that are counted as SMEs range from family businesses to small production plants.

in their incomes. Table 1 shows the distribution of the best income year and the worst income year. Among 1,440 households, 12.85% of the households name 2004 as their best income year while 27.08% of the households name 2004 as their worst income year. The data suggests that the incomes of households move together much less than indicated by the aggregate data. The discrepancy between the aggregate and disaggregate analysis is due to the heterogeneity among households. The main point here is that the macro aggregates can present a misleading picture of the welfare of all households. This point also leads to the purpose of this paper: examine the risk environment by taking into account the heterogeneity among households.

Next I examine the source of shocks faced by households. In the MOF survey, households were asked to report the top reason for a shortfall in income. Shocks enumerated in the MOF survey fall into five broad categories: (1) climatic and agriculture-related shocks, for example drought, flood and pests ; (2) price shocks consisting of high input prices and low output prices; (3) random factors affecting household demographics, for example birth, death and incidence of illness within a family; (4) shocks related to labor, for example retirement and working fewer days; and (5) shocks associated with variations in prices of other goods besides input and output, for example high investment cost, high education cost, high expenditure due to ceremonies.[5]

Table 2 presents the most important reason for a shortfall in income. Among households report to have experienced an income shock during the past five years, 30.18% of the households report price shocks as the most important reason for an income shortfall. Shocks associated with changes in prices of other goods is the next most important reason, named by 27.36% of the households. These are followed by shocks associated with changes in labor market outcomes which is named by 16.2% of the households. Climatic and agricultural related shocks are named as the most important reason for an income shortfall by 11.53% of the households. Surprisingly, climatic and agricultural related shocks are not the most common cause of shocks for households in Thailand. These findings offer an interesting contrast with the existing literature. Dercon (2001) finds that climatic events are the most common cause of shocks in Ethiopia; about 78% of the households suffer from climatic shocks. Townsend (1994) examines the relevant aspects of production, income and risk, using the ICRISAT village data. He finds high yearly yield fluctuations per unit of land for the dominant crops. The coefficient of variation is high, ranging from 1.01 for caster to 0.70 for paddy.

The role of agro-climatic shock found in this paper is relatively small compared to previous studies. There may be two explanations for this finding. The first explanation is that, as the data obtained from the MOF survey is quite recent (2005), agro-climatic shocks may be less important in recent years. Agro-climatic shocks have become less important because of urbanization, along with migration from rural to urban areas, a shift in occupation away from agriculture towards sales and service industries and better technology to deal with agro-climatic shocks. The second explanation is that, because other studies focused only on rural or agricultural households while this study also examines urban households, agro-climatic shocks may be less important for other types of households.

The question is which scenario can better explain the limited (or insignificant) role of agro-climatic shocks. With the MOF survey data, however, we may not be able to conclude that this is due to the first explanation. The reason is the data is one-year cross-section, which

[5] There are some shocks that cannot be classified into the five categories, for example lost from gambling and unable to repay debt. These other shocks account for about 5% of the households.

does not constitute a time series. Thus, one will not be able to see changes in the source of risk over time from the data. Nonetheless, one may still be able to examine whether the second explanation is relevant by comparing the source of shocks faced by households in rural and urban areas.

Table3 compares the source of risk between rural and urban households. As evident from table3, the source of shocks faced by rural households differs from that of urban households. Not surprisingly, agro-climatic shocks are more important to rural households than urban households. About 15% of the rural households named agro-climatic shocks as the cause of their income shocks compared to 4% in the case of the urban households. On the other hand, shocks associated with changes in prices of other goods (beside input and output prices) is the most important for the urban households. About 33.5% of the urban households name shocks associated with changes in prices of other goods as the reason for the falls in income in contrast to 24% for the rural households. Surprisingly, shocks to input and output prices are the most important for the rural households (30%). They are also important for the urban households even though the number is slightly lower (28%).

Risk patterns can also be characterized by occupational groups. Different types of households are exposed to different kinds of risks. Because most urban households are wage earners and business owners, I also investigate whether agro-climatic shocks are less important for other types of households by comparing the source of shocks faced by different occupations.

Most of the households in Thailand obtain their income from different sources. I classify households into three groups according to the source of their principal income. The three types of households are farm households, wage earners and business owners. If the main source of income accruing to a household is farming, then the household is classified as a farm household. On the other hand, if wages and salaries are the principal component of household income, then the household is classified as a wage earner. Finally, if a household earns most of its income from running its own business, then the household is classified as a business owner. Table 4 shows the main causes of the shortfalls in income by type of households.

Not surprisingly, agro-climatic shocks are the most common cause of shock for farm households but are less important for wage earners and business owners. Agro-climatic shocks are named as the most important reason of income shock by 45.5% of the farm households. Price shocks are the next most important, named by 37.8% of the farm households. In contrast with farm households, only 11.3% of the wage earners and 4.3% of the business owners name agro-climatic shocks as the cause of bad income. For wage earners, price shocks and shocks associated with household labor markets are the major reasons for income shortfalls. For business owners, evidently, the principal source of income fluctuation is price shock. About 42% of the business owners name shock to input and output prices as the main reason for income shortfalls.

The key point is that price shocks play an increasingly important role as the source of risks confronting households. The importance of price risk is reflective of the extent to which households are exposed to market forces. In a subsistent economy where household production is merely for household consumption, fluctuations in market prices are barely important. As households start producing for market, price risks become important for households.

3.2 Idiosyncratic versus Aggregate Shock

Shocks can be aggregate or idiosyncratic. Aggregate shock affects everybody in a particular community while idiosyncratic shock affects a particular individual or household in a community. The distinction is important because risk pooling and insurance arrangements are more likely to offer protection against idiosyncratic shocks rather than aggregate shock. This is why it is important to identify whether shock faced by households is idiosyncratic or aggregate

In practice, few risks are purely idiosyncratic or aggregate. To examine the extent to which a shock is aggregate or common to all households in the community, I examine the time in which the shock hits the households. In the MOF survey, households are asked to name the worst income year during the past five years. This information allows me to quantitatively test whether the shock hits households uniformly at the same time. I run a regression where the dependent variable is the year that the shock hits a household and the independent variables are a set of village dummies. The idea is that if shock is aggregate or common to all households within a village, the explanatory power of the villlage dummies should be high. To be more precise, the R-squared obtained from the regression on the set of the village dummies gives measures of the extent to which the shock is common to all households in the village. The lower is the explanatory power of the village dummies, the more idiosyncratic is the shock. Table 5 presents results from the regression.

In the MOF data, these village dummies yield only 23% as an adjusted R-squared. The key point is that the explanatory power of the village dummies is low, suggesting that even within the same villages, shocks do not hit all households uniformly at the same time.

Next I consider the sources of risks that confront the households. I run a similar regression where the dependent variable is now the main reason for income shortfalls and the independent variables are a full set of village dummies. If shock is aggregate or common to all households within a village, the explanatory power of the villlage dummies should be high. On the other hand, if shock is more idiosyncratic, the village dummies should explain very little of the variation in the source of shock. The regression results are also shown in table 5.

The village dummies yield only 27% as an adjusted R-squared, suggesting that even within the same villages, not all households are experiencing the same kinds of risks. In other words, there appears to be some variations in the sources of shocks across households in a given village.

Other studies also find that the idiosyncratic part of income shock is relatively large. Using Côte d'Ivoire LSMS data, Deaton (1997) finds that common components for particular villages explain very little of the variation of household income. Using Thai household data, Townsend (1995) finds that there are few common regional components in income growth. Using the Indian ICRISAT data, Townsend (1995) reports similar evidence, suggesting that there is limited co-movement in incomes within the villages. Also using the ICRISAT data, Morduch (2001) reports that idiosyncratic risk (inclusive of measurement error) accounts for 75 to 96% of the total variance in income in these villages. Udry (1991) reports similar magnitudes for Northern Nigeria.

The key point is that the idiosyncratic part of income shock is large. This suggests that there may be potential benefit for risk pooling and insurance arrangements.

4. Household Risk Management Strategies

In the previous section, we see that rural and urban households in Thailand face substantial risk. Previous studies on risk and insurance find that households in such an environment do not just undergo the consequences of high risk. Instead, households facing a risky environment have employed a number of strategies to reduce the impact of shocks. For example, Townsend (1995) finds that rural households in Thailand have succeeded in smoothing consumption during the periods of severe income shocks. Rosenzweigh and Wolpin (1993) finds that rural households in India have engaged in buying and selling of livestocks for self-insurance. Other mechanisms might include grain inventories (Paxson and Chaudhuri [1994]), holdings of cash (Lim and Townsend [1994]) and taking recourse to credit. This section examines the strategies and tools the rural and urban households in Thailand use to manage risks.

Before going into details, it is important to distinguish between ex-ant and ex-post risk management strategies. Coping with risks can occur in two stages. First, households can smooth income; this is most often achieved by choosing safer but also less profitable production choices and diversifying income-generating activities, for example, crop diversification, plot diversification and income diversification. In this way, households take steps to protect themselves from adverse income shocks before they occur. Second, households can smooth consumption; this is most often achieved by borrowing and saving, selling and accumulating assets, adjusting labor supply, and employing formal and informal insurance arrangements. These mechanisms, which usually take force after shocks occur, help insulate consumption from income fluctuation.

4.1 Consumption Smoothing/ ex-post strategies

Households utilize a variety of ex-post strategies to deal with shocks. In the MOF survey, households were asked to name the top three responses they undertook to mitigate the impact of the shock. These responses can be grouped into eight categories: (1) selling livestocks and stored rice; (2) cutting household expenditure; (3) selling non-financial assets such as land and jewelry; (4) working more hours; (5) dissaving or withdrawing from savings; (6) receiving help from the government, relatives or others; (7) borrowing from both formal and informal lenders; and (8) migrating to other places for work opportunities. Table 6 lists various responses to an income shock and the percentage of households within each response.

The primary device for coping with risk is borrowing. Specifically if we look at the line marked borrowing, we see that 33.4% of the households use borrowing as a tool to mitigate the adverse effects from income shocks. But the number is lower for the rural households, 31.3%, than for the urban households, 37.7%. The finding that borrowing is the most common response to risk suggests that borrowing plays a prominent role as a consumption-smoothing and mechanism and an insurance against income shocks.

Dissaving is the second most common response, named by about 24.1% and 23.6% of the urban and rural households respectively. It is worth noting that households rely more on borrowing than dissaving; perhaps this is because opportunities for savings are restricted or savings offer limited protection against shocks. Cutting households expenditures is the third most common response, named by 13.9% and 12% of the urban and the rural households.

Among the three most common responses, there appears to be not much difference in responses to risk between the urban and the rural households. However, when considering beyond the three most common responses, we find that selling livestocks and stored rice plays a more important role for the rural households, 7.6%, than for the urban households, 1.9%. The same is true for working more hours; working more hours is named as a risk response by 11.1% of the rural households in contrast to 6.0% of the urban households.

Since borrowing is the most common response to risk, it is interesting to examine which particular lenders households use. The percentage of households borrowing from each lender type is shown in Table 7.

The Village Fund, which supplied loans to about 74% of the borrowing households, is the largest lender, in terms of the number of the households. However, the number is significantly lower for the rural households, 68%, than for the urban households, 84%. After the Village Fund, the other major providers of loans differ between the rural and the urban households. The BAAC plays a more important role in the rural areas, 12.8%, than in the urban areas, 3%. Similarly, informal lenders such as agricultural cooperatives and moneylenders also play a larger role in the rural areas, 14.5%, than in the urban areas, 8%. Commercial banks play a relatively small role; commercial banks supplied loans to only 4.8% of the households. However, in terms of the total value of loans, commercial banks appear to play a larger role since their loan sizes are much larger than the other lenders.

From the previous section, we see that the sources of risk varies enormously across different types of households. In particular, we find that the principal risk facing farm households is climatic and agriculture related shocks; for wage earners – shocks associated with labor markets and household expenses; and for business owners – price shocks. Because farm households, wage earners and business owners are subject to different types of risks, one may expect that these households may employ different risk management strategies. Table 8 presents the distribution of different risk-mitigating strategies by types of households.

Apparently, different types of households tend to employ different risk-mitigating strategies. For farm households, dissaving is the most common response, named by 26.7% of farm households. Borrowing is the second most common response, named by 24.4% of farm households. The opposite is true for wage earners; borrowing is the most common response, 31.8%, followed by dissaving, 29.2%. Borrowing however plays a significantly larger role for business owners. About 36.5% of business owners used borrowing as risk coping strategies while only 19.2% used savings.

Table 9 highlights the common types of lending institutions that households borrow from.

For farm households, the BAAC, which supplies over a half of the household loans, is the largest supplier in terms of the number of the households. After the BAAC, the other major providers of loans to farm households are the Village Fund, which supplies loans to 27.3% of farm households, and informal lenders, which supplies loans to 13.6% of farm households. For wage earners and business owners, the Village Fund provides over 75% of the household loans. After the Village Fund, the other major providers of loans are informal lenders. Interestingly, the BAAC is not the main provider of the household loans to wage earners and business owners. Commercial banks play a relatively larger role for business owners than for farm households and wage earners.

4.2 Income Smoothing/ ex-ante strategies

Besides ex-post strategies, households may employ ex-ante strategies to directly reduce an income fluctuation. In this section, I examine whether households diversify their income-generating activities. The conventional method is to compute the variance-covariance matrix of income from various sources. With the MOF survey data, however, we are not able to compute the variance-covariance matrix because the data is one-year cross-section, which does not constitute a time series. Nevertheless, the data reveals that a number of households collect their income from various sources. Table 10 shows the number of income sources per household. The majority of households, 57%, earn their incomes from multiple sources. About 43% of the households earn their income from a single source. For households that earn their incomes from multiple sources, it may be possible that one source accounts for a tiny amount of income while the other source accounts for a large amount. To account for this, I calculate the concentration index of household's income sources[6]. Table 11 gives the concentration. If a household earns income from the three sources equally, then the concentration index is equal to 0.33. On the other hand, if a household earns income from a single source, then the concentration index is equal to 1. Table 10 and table 11 together suggest that households may not diversify much; perhaps this is because diversification possibilities within the househols may be relatively limited. This will be the case if all members of households participate in a similar activity.

5. Conclusion and Policy Implication

This paper analyzed risk environment and risk-management strategies of both rural and urban households in Thailand. The analysis was based on a sample of 1440 households across 96 villages in Thailand. The sample was designed to be representative of rural and urban households in Thailand; among them are farm households, wage earners and entrepreneurs.

The findings in this paper revealed several interesting points. First, the sources of shocks and the time that shocks hit households vary considerably across households in a given village. Second, responses to risks vary considerably across households in a given village. Third, principal risks differ significantly across different types of households. Forth, there are variations in responses to risk across different types of households. Finally, the diversity of risk environments facing households suggests that the idea of all households in the same geographical area experiencing homogenous risks or economic environments might turn out to be misleading. This provides an evidence that the assumption of a representative consumer may not be valid in every circumstance.

The policy implication of this paper is that policy makers should take into account the diversity of risk environments when designing measures to reduce households' vulnerability to income shortfalls. Policy that is implemented on a basis of a representative consumer can be ineffective because underneath the representative consumer and macro aggregates lie a rich variety of the nature of households as well as households' risk environments.

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[6] The concentration index of household's income sources is calculated by the formular: $H = \Sigma s_i^2$ where s_i is the share of household's income from source i. The index is calculated in a similar way as the industry concentration index or the Herfindahl index.

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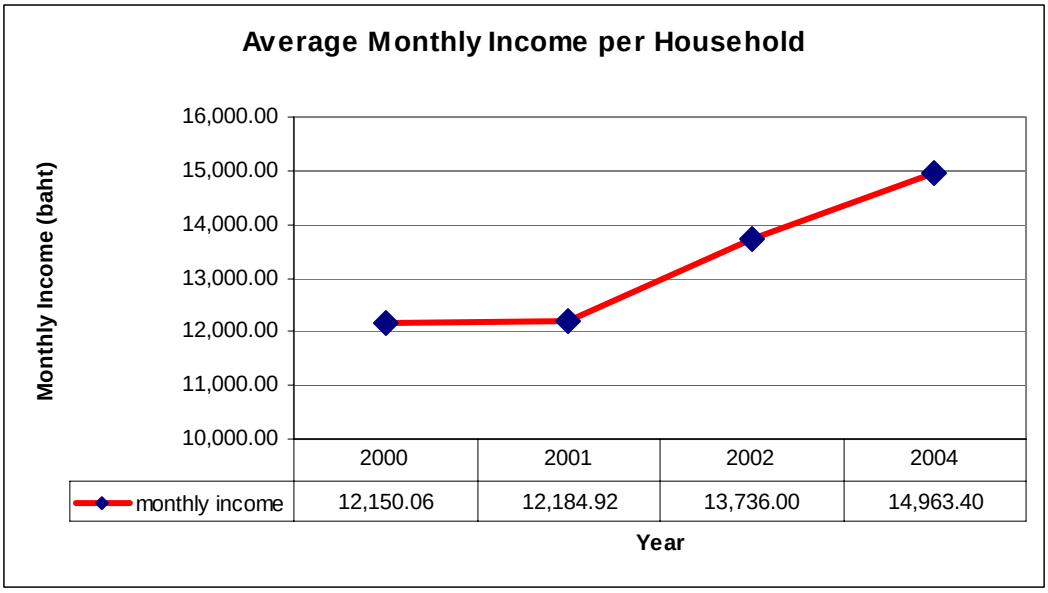
Figure 1: Average Monthly Income per Household



Source: National Statistical Office

Table 1: The Distribution of the Best Income and the Worst Income Years – Number and Percentage of Households

	Best income year		**Worst income year**	
year	Number of hh	percent	Number of hh	percent
2000	148	10.28	100	6.94
2001	97	6.74	79	5.49
2002	123	8.54	121	8.4
2003	129	8.96	126	8.75
2004	185	12.85	390	27.08
No changes in income	758	52.64	624	43.33
Total	*1440*	*100*	*1440*	*100*

Table 2: Most Important Reason for a Shortfall in Income – Number and Percentage of Households

source of risk	**overall**	
	number	%
climatic and agriculture-related shocks	94	11.53
price shocks	247	30.18
random factors affecting household demographics	78	9.57
shocks associated with labor market	132	16.2
shocks associated with household expenses	222	27.36

other reasons	42	5.15
Total	*815*	*100%*

Table 3: Source of Risk between Urban and Rural Households

source of risk	**urban**		**rural**	
	number	%	number	%
climatic and agriculture-related shocks	11	4.15%	83	15.09%
price shocks	76	28.68%	170	30.91%
random factors affecting household demographics	27	10.19%	51	9.27%
shocks associated with labor market	50	18.87%	82	14.91%
shocks associated with household expenses	89	33.58%	134	24.36%
other reasons	12	4.53%	30	5.45%
Total	*265*	*100%*	*550*	*100%*

Table 4: Source of Risk by Type of Households

source of risk	**farm**		**wage earner**		**entrepreneur**	
	number	%	number	%	number	%
climatic and agriculture-related shocks	41	45.56	35	11.36	18	4.33
price shocks	34	37.78	65	21.1	146	35.1
random factors affecting household demographics	7	7.78	40	12.99	31	7.45
shocks associated with labor market	1	1.11	74	24.03	57	13.7
shocks associated with household expenses	6	6.67	74	24.03	143	34.38
other reasons	1	1.11	20	6.49	21	5.05
Total	*90*	*100*	*308*	*100*	*416*	*100*

Table 5: The Contribution of Village Level Variance to Total Variance

Dependent Variable	**R-squared***
time that shock hit household	0.2354
source of shock	0.2722

* The results on the contribution of village level to total variance are obtained from the regression of dependent variable against a full set of village level dummies. The extent to which shocks are aggregate is measured by R-squared.

Table 6: Household's Response to an Income Shock

	overall		urban		rural	
Response	**number of hh**	**%**	**number of hh**	**%**	**number of hh**	**%**
sell livestocks and stored rice	49	6.02%	5	1.89	42	7.64%
cut household expenditure	103	12.64%	37	13.96	66	12.00%
sell assets, e.g. land, jewelry	16	1.96%	4	1.5	12	2.18%
work more	77	9.44%	16	6.03	61	11.09%
use saving	194	23.8%	64	24.15	130	23.64%
receive help	76	9.33%	25	9.43	51	9.27%
from government	1	0.12%	0	0	1	0.18%
from relatives	66	8.1%	24	9.05	42	7.64%
from others	9	1.11%	1	0.38	8	1.45%
borrow	272	33.37%	100	37.73	172	31.27%
from BAAC	25	3.06%	3	1.13	22	4.00%
from village fund	201	24.66%	84	31.7	117	21.27%
from other informal lenders	33	4.05%	8	3.01	25	4.55%
from commercial bank	13	1.6%	5	1.89	8	1.45%
migrate to other place for work opportunity	2	0.25%	0	0	2	0.36%
other	26	3.18%	12	4.53	14	2.55%
Total	*815*	*100%*	*265*	*99%*	*550*	*100%*

Table 7: Lending Institutions – Number and Percentage of Household

	overall		urban		rural	
Lender Type	**number of hh**	**%**	**number of hh**	**%**	**number of hh**	**%**
from BAAC	25	9.2%	3	3.0%	22	12.8%
from village fund	201	73.9%	84	84.0%	117	68.0%
from other informal lenders	33	12.1%	8	8.0%	25	14.5%
from commercial bank	13	4.8%	5	5.0%	8	4.6%

Table 8: Household's Response to an Income Shock by Type of Household

Response	**farm**		**wage earner**		**business owner**	
	number of hh	**%**	**number of hh**	**%**	**number of hh**	**%**
sell livestocks and stored rice	18	20	18	5.84	12	2.88
cut household expenditure	3	3.33	45	14.61	55	13.22
sell assets, e.g. land, jewelry	3	3.33	4	1.3	9	2.16
work more	16	17.78	19	6.17	42	10.1
use saving	24	26.67	90	29.22	80	19.23
receive help	3	3.33	24	7.79	49	11.78
borrow	22	24.44	98	31.78	152	36.53
migrate to other place for work			1	0.32	1	0.24

opportunity						
other	1	1.11	9	2.92	16	3.85
Total	*90*	*99.99*	*308*	*99.95*	*416*	*99.99*

Table 9: Lending Institutions by Type of Household

	farm		**wage earner**		**business owner**	
Lender Type	**number of hh**	**%**	**number of hh**	**%**	**number of hh**	**%**
from BAAC	13	59.1%	4	4.1%	8	5.3%
from village fund	6	27.3%	77	78.6%	118	77.6%
from other informal lenders	3	13.6%	14	14.3%	16	10.5%
from commercial bank	0	0.0%	3	3.1%	10	6.6%

Table 10: Number of Income Sources per Household

Number of Income Source	**Number of hh**	**%**
1	623	43.29%
2	692	48.09%
3	124	8.62%
Total	*1440*	*100%*

Table 11: The Concentration Index of Household's Income Sources

Index	**% of households**
[0, 0.1)	0
[0.1. 0.2)	0
[0.2, 0.3)	0
[0.3, 0.4)	0.9
[0.4, 0.5)	1.46
[0.5, 0.6)	24.19
[0.6, 0.7)	9.31
[0.7, 0.8)	7.78
[0.8, 0.9)	5.14
[0.9, 1)	7.93
1	43.29